FINAL REPORT

Contents:	Volume 1 of 6 Text, Figures, and Summary Tables
Study Title:	A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats
Laboratory Project ID:	WIL-402011
Author:	[redacted]
Test Guideline:	U.S. EPA OPPTS 870.3650 and 870.5395, ICH Guideline S2A and S2B, and OECD Guidelines 422 and 474
Study Completion Date:	30 August 2012
Performing Laboratory:	WIL Research Laboratories, LLC 1407 George Road Ashland, OH 44805-8946
Sponsor:	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
Total Number of Pages:	1897

COMPLIANCE STATEMENT

This study, designated WIL-402011, was conducted in compliance with the United States EPA TSCA GLP Standards (40 CFR Part 792), 18 September 1989; the OECD Principles of GLP [C(97) 186/Final], 26 November 1997; WIL Research SOPs (for activities conducted at WIL Research); and the protocol as approved by the Sponsor. Due to the nature of the test substance, acceptance limits for stability cannot be determined. However, based on before and after use characterization analyses that were conducted, approximately 90% of the total mass of the test substance is accounted for in the same C14-C16 carbon number range, indicating that the material was likely stable for the duration of use, and any variance noted had no impact on the outcome of the study.

The study was conducted in general accordance with the United States EPA Health Effects Test Guidelines OPPTS 870.3650, Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test, July 2000; the OECD Guideline for Testing of Chemicals, Guideline 422, Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening, 22 March 1996; the United States EPA Health Effects Test Guidelines OPPTS 870.5395, Mammalian Erythrocyte Micronucleus Test, August 1998; the ICH Guidelines S2A and S2B; and the OECD Guideline 474.

Study Director: [redacted] 30 Aug 2012
Signature Date

Typed Name of Signer: [redacted]

Typed Name of Laboratory: WIL Research Laboratories, LLC

Sponsor: _____ _____
Signature Date

Typed Name of Signer: [redacted]

Typed Name of Company: American Petroleum Institute

Submitter: _____ _____
Signature Date

Typed Name of Signer: _____

Typed Name of Company: _____

TABLE OF CONTENTS

VOLUME 1 Page

Compliance Statement **2**
Table of Contents **4**
Index of Figures **8**
Index of Tables **9**
Index of Appendices **14**
1. Summary **22**
1.1. Objective 22
1.2. Study Design 22
1.3. Results 23
1.4. Conclusion 28
2. Introduction **29**
2.1. General Study Information 29
2.2. Key Study Dates 29
2.3. Contributing Scientists 30
2.4. Principal Investigators and Test Sites 30
2.5. WIL Research Key Study Personnel 30
3. Study Design **31**
4. Experimental Procedures - Materials and Methods **33**
4.1. Test substance, Vehicle, and Positive Control Article 33
4.1.1. Test substance 33
4.1.2. Vehicle 33
4.1.3. Positive Control Article 34
4.1.4. Preparation 34
4.1.5. Sampling and Analyses 35
4.2. Test System, Animal Receipt, and Acclimation Period 36
4.3. Animal Housing 37
4.4. Diet, Drinking Water, and Maintenance 37

VOLUME 1 (continued) Page

4.5. Environmental Conditions 38
4.6. Assignment of Animals to Treatment Groups 38
4.7. Organization of Test Groups, Dosage Levels, and Treatment Regimen....39
5. Parameters Evaluated 41
5.1. Clinical Observations and Survival 41
5.2. Body Weights....41
5.3. Food Consumption....42
5.4. Breeding Procedures 42
5.5. Parturition 43
5.6. FOB Assessments 43
5.6.1. Home Cage Observations 44
5.6.2. Handling Observations....44
5.6.3. Open Field Observations....44
5.6.4. Sensory Observations....45
5.6.5. Neuromuscular Observations....45
5.6.6. Physiological Observations....45
5.7. Locomotor Activity....45
5.8. Clinical Pathology....46
5.8.1. Hematology and Coagulation 47
5.8.2. Serum Chemistry 47
5.9. Anatomic Pathology....48
5.9.1. Macroscopic Examinations....48
5.9.2. Organ Weights 50
5.9.3. Microscopic Examinations....50
5.10. Micronucleus Evaluation 51
5.11. F_1 Litter Parameters 52
5.11.1. Litter Viability and Deaths....52
5.11.2. Clinical Observations....52

VOLUME 1 (continued) Page

5.11.3. Body Weights....52
5.11.4. Sex Determination....53
5.11.5. Calculation of Litter Parameters....53
5.11.6. Scheduled Euthanasia....53
5.12. Data Acquisition and Analysis....53
5.12.1. Acquisition and Reporting....53
5.12.2. Statistical Analyses....54
5.12.2.1. Analyses Conducted by WIL Research....55
5.12.2.2. Analyses Conducted by BioSTAT Consultants, Inc.....56
5.12.2.3. Statistics Conducted by Midwest Bioresearch, LLC....57
6. Results....58
6.1. Analyses of Dosing Formulations....58
6.2. F_0 Generation....60
6.2.1. Clinical Observations and Survival....60
6.2.2. Body Weights....61
6.2.2.1. Males....61
6.2.2.2. Females....63
6.2.2.2.1. Pre-Mating....63
6.2.2.2.2. Gestation....63
6.2.2.2.3. Lactation....65
6.2.3. Food Consumption....66
6.2.3.1. Males....66
6.2.3.2. Females....67
6.2.3.2.1. Pre-Mating....67
6.2.3.2.2. Gestation....68
6.2.3.2.3. Lactation....68
6.2.4. Functional Observational Battery (FOB)....69
6.2.4.1. Home Cage Observations....69
6.2.4.2. Handling Observations....70

VOLUME 1 (continued) Page

6.2.4.3. Open Field Observations....70
6.2.4.4. Sensory Observations....71
6.2.4.5. Neuromuscular Observations....71
6.2.4.6. Physiological Observations....72
6.2.5. Locomotor Activity....73
6.2.6. Clinical Pathology....73
6.2.6.1. Hematology....73
6.2.6.2. Serum Chemistry....75
6.2.7. Reproductive Performance....76
6.2.8. Gestation Length and Parturition....77
6.2.9. Anatomic Pathology....77
6.2.9.1. Macroscopic Examinations....77
6.2.9.2. Organ Weights....79
6.2.9.3. Microscopic Examinations....81
6.2.9.4. Discussion of Microscopic Findings....84
6.2.9.5. Micronucleus Evaluation....86
6.3. F_1 Litter Data....87
6.3.1. PND 0 Litter Data and Postnatal Survival....87
6.3.2. General Physical Condition....88
6.3.3. Offspring Body Weights....89
6.3.4. Necropsies of Pups (Unscheduled Deaths)....89
7. Discussion....91
8. Conclusions....95
9. Report Review and Approval....96
10. Quality Assurance Statement....97
11. References....100
12. Data Retention....103
13. Abbreviations....104

INDEX OF FIGURES

VOLUME 1 (continued) Page

1. Summary of Body Weights [g] (F_0 Males) 107
2. Summary of Body Weights [g] (F_0 Females) 108
3. Summary of Body Weights during Gestation [g] (F_0 Females) 109
4. Summary of Mean Forelimb Grip Strength [g] (F_0 Males) 110
5. Summary of Mean Hindlimb Grip Strength [g] (F_0 Males) 111
6. Summary of Mean Forelimb Grip Strength [g] (F_0 Females) 112
7. Summary of Mean Hindlimb Grip Strength [g] (F_0 Females) 113
8. Summary of Motor Activity Total Counts By Session (F_0 Males) 114
9. Summary of Motor Activity Total Counts (F_0 Males - Pretest) 115
10. Summary of Motor Activity Total Counts (F_0 Males - Week 4) 116
11. Summary of Motor Activity Ambulatory Counts By Session (F_0 Males) 117
12. Summary of Motor Activity Ambulatory Counts (F_0 Males - Pretest) 118
13. Summary of Motor Activity Ambulatory Counts (F_0 Males - Week 4) 119
14. Summary of Motor Activity Total Counts By Session (F_0 Females) 120
15. Summary of Motor Activity Total Counts (F_0 Females - Pretest) 121
16. Summary of Motor Activity Total Counts (F_0 Females - Lactation Day 4) 122
17. Summary of Motor Activity Ambulatory Counts By Session (F_0 Females) 123
18. Summary of Motor Activity Ambulatory Counts (F_0 Females - Pretest) 124
19. Summary of Motor Activity Ambulatory Counts (F_0 Females - Lactation Day 4) 125

INDEX OF TABLES

Note: Some table titles have been shortened due to software spacing constraints.

VOLUME 1 (continued) Page

SUMMARY DATA - F_0 GENERATION

S1. Summary of Clinical Findings (F_0 Males - Detailed Physical Examinations) 127

S2. Summary of Clinical Findings (F_0 Females - Detailed Physical Examinations) 129

S3. Summary of Post-Dose Findings (F_0 Males) 132

S4. Summary of Post-Dose Findings (F_0 Females) 134

S5. Summary of Body Weights [g] (F_0 Males) 136

S6. Summary of Body Weight Changes [g] (F_0 Males) 138

S7. Summary of Body Weights [g] (F_0 Females) 140

S8. Summary of Body Weight Changes [g] (F_0 Females) 141

S9. Summary of Body Weights during Gestation [g] (F_0 Females) 142

S10. Summary of Body Weight Changes during Gestation [g] (F_0 Females) 144

S11. Summary of Body Weights during Lactation [g] (F_0 Females) 146

S12. Summary of Body Weight Changes during Lactation [g] (F_0 Females) 147

S13. Summary of Food Consumption [g/animal/day] (F_0 Males) 148

S14. Summary of Food Consumption [g/kg/day] (F_0 Males) 149

S15. Summary of Food Consumption [g/animal/day] (F_0 Females) 150

S16. Summary of Food Consumption [g/kg/day] (F_0 Females) 151

S17. Summary of Food Consumption during Gestation [g/animal/day] (F_0 Females) 152

S18. Summary of Food Consumption during Gestation [g/kg/day] (F_0 Females) 154

VOLUME 1 (continued) Page

S19. Summary of Food Consumption during Lactation [g/animal/day] (F_0 Females) 156

S20. Summary of Food Consumption during Lactation [g/kg/day] (F_0 Females) 157

S21. Summary of Functional Observational Battery Data (F_0 Males - Home Cage Observations - Pretest) 158

S22. Summary of Functional Observational Battery Data (F_0 Males - Home Cage Observations - Week 4) 159

S23. Summary of Functional Observational Battery Data (F_0 Females - Home Cage Observations - Pretest) 160

S24. Summary of Functional Observational Battery Data (F_0 Females - Home Cage Observations - Lactation Day 4) 161

S25. Summary of Functional Observational Battery Data (F_0 Males - Handling Observations - Pretest) 162

S26. Summary of Functional Observational Battery Data (F_0 Males - Handling Observations - Week 4) 165

S27. Summary of Functional Observational Battery Data (F_0 Females - Handling Observations - Pretest) 168

S28. Summary of Functional Observational Battery Data (F_0 Females - Handling Observations - Lactation Day 4) 171

S29. Summary of Functional Observational Battery Data (F_0 Males - Open Field Observations - Pretest) 174

S30. Summary of Functional Observational Battery Data (F_0 Males - Open Field Observations - Week 4) 176

S31. Summary of Functional Observational Battery Data (F_0 Females - Open Field Observations - Pretest) 178

S32. Summary of Functional Observational Battery Data (F_0 Females - Open Field Observations - Lactation Day 4) 180

S33. Summary of Functional Observational Battery Data (F_0 Males - Sensory Observations - Pretest) 182

VOLUME 1 (continued) Page

S34. Summary of Functional Observational Battery Data (F_0 Males - Sensory Observations - Week 4) 184

S35. Summary of Functional Observational Battery Data (F_0 Females - Sensory Observations - Pretest) 186

S36. Summary of Functional Observational Battery Data (F_0 Females - Sensory Observations - Lactation Day 4) 188

S37. Summary of Functional Observational Battery Data (F_0 Males - Neuromuscular Observations - Pretest) 190

S38. Summary of Functional Observational Battery Data (F_0 Males - Neuromuscular Observations - Week 4) 191

S39. Summary of Functional Observational Battery Data (F_0 Females - Neuromuscular Observations - Pretest) 192

S40. Summary of Functional Observational Battery Data (F_0 Females - Neuromuscular Observations - Lactation Day 4) 193

S41. Summary of Functional Observational Battery Data (F_0 Males - Physiological Observations - Pretest) 194

S42. Summary of Functional Observational Battery Data (F_0 Males - Physiological Observations - Week 4) 195

S43. Summary of Functional Observational Battery Data (F_0 Females - Physiological Observations - Pretest) 196

S44. Summary of Functional Observational Battery Data (F_0 Females - Physiological Observations - Lactation Day 4) 197

S45. Summary of Motor Activity Counts (F_0 Males) 198

S46. Summary of Motor Activity Counts (F_0 Females) 206

S47. Summary of Hematology Values (F_0 Males) 214

S48. Summary of Hematology Values (F_0 Females - Lactation Day 4) 221

S49. Summary of Serum Chemistry Values (F_0 Males) 228

S50. Summary of Serum Chemistry Values (F_0 Females - Lactation Day 4) 233

VOLUME 1 (continued) Page

S51. Summary of Special Chemistry Values (F_0 Males) 238

S52. Summary of Special Chemistry Values (F_0 Females - Lactation Day 4) 239

S53. Summary of Reproductive Performance (F_0) 240

S54. Summary of Gestation Lengths [days] (F_0 Females) 243

S55. Summary of Parturition Findings: Total Occurrence/No. of Females (F_0 Females) 244

S56. Summary of Macroscopic Findings (F_0 Males - Scheduled Necropsy) 245

S57. Summary of Macroscopic Findings (F_0 Females - Unscheduled Death) 247

S58. Summary of Macroscopic Findings (F_0 Females - Failed to Deliver) 248

S59. Summary of Macroscopic Findings (F_0 Females - Total Litter Loss) 249

S60. Summary of Macroscopic Findings (F_0 Females - Lactation Day 4) 250

S61. Summary of Corpora Lutea and Implantation Sites (F_0 Females - Lactation Day 4) 251

S62. Summary of Organ Weights and Relative Organ Weights (F_0 Males - Scheduled Necropsy) 252

S63. Summary of Organ Weights and Relative Organ Weights (F_0 Females - Lactation Day 4) 262

S64. Summary of Microscopic Findings (F_0 Males - Scheduled Necropsy) 271

S65. Summary of Microscopic Findings (F_0 Females - Unscheduled Death) 282

S66. Summary of Microscopic Findings (F_0 Females - Failed to Deliver) 291

S67. Summary of Microscopic Findings (F_0 Females - Total Litter Loss) 300

S68. Summary of Microscopic Findings (F_0 Females - Lactation Day 4) 309

SUMMARY DATA - F_1 LITTERS

S69. Summary of PND 0 Litter Data (F_1) 319

VOLUME 1 (continued) Page

S70. Summary of Postnatal Survival [% per litter] (F_1).....320

S71. Summary of Clinical Findings: Total Occurrence/No. of Pups (F_1).....321

S72. Summary of Offspring Weights [g] (F_1).....323

S73. Summary of Offspring Weight Changes [g] (F_1).....324

S74. Summary of Pup Necropsy Findings (F_1 - Unscheduled Deaths).....325

INDEX OF APPENDICES

VOLUME 2 **Page**

A. Study Protocol and Deviations 327

B. Test Substance Characterization (WIL Research Laboratories, LLC) 379

C. Certificate of Analysis, Test Substance Analyses Report, and Material Safety Data Sheet (Supplier- or Sponsor-Provided Data) 406

D. Analyses of Dosing Formulations (WIL Research Laboratories, LLC) 421

E. Animal Room Environmental Conditions 462

F. FOB Scoring Criteria 469

G. Neurobehavioral Validation and Positive Control Data [Crl:CD(SD) Rats] 485

H. Clinical Pathology Methods, Procedures, and References 616

I. Pathology Report (WIL Research Laboratories, LLC) 622

J. Historical Control Data for Micronucleus Evaluation (Midwest BioResearch, LLC) 649

K. Micronucleus Assay Report (Midwest BioResearch, LLC) 666

VOLUME 3

L. Statistical Analysis Summary (BioSTAT Consultants, Inc.) 676

M. WIL Subchronic FOB Historical Control Data Version 1.2 [Crl:CD(SD) Rats] 697

N. WIL Subchronic Motor Activity Historical Control Data Version 1.5 [Crl:CD(SD) Rats] 837

O. WIL Reproductive Historical Control Data Version 2.11 [Crl:CD(SD) Rats] 866

VOLUME 3 (continued) **Page**

P. Individual Animal Data 876

F_0 GENERATION

A1. Individual Clinical Observations (F_0 Males - Detailed Physical Examinations) 877

A2. Individual Clinical Observations (F_0 Females - Detailed Physical Examinations) 899

A3. Individual Clinical Observations (F_0 Males - At Time of Dosing) 926

A4. Individual Clinical Observations (F_0 Females - At Time of Dosing) 928

A5. Individual Clinical Observations (F_0 Males - 1 Hour Post-Dosing) 933

VOLUME 4

A6. Individual Clinical Observations (F_0 Females - 1 Hour Post-Dosing) 989

A7. Individual Body Weights [g] (F_0 Males) 1069

A8. Individual Body Weight Changes [g] (F_0 Males) 1075

A9. Individual Body Weights [g] (F_0 Females) 1081

A10. Individual Body Weight Changes [g] (F_0 Females) 1087

A11. Individual Body Weights during Gestation [g] (F_0 Females) 1093

A12. Individual Body Weight Changes during Gestation [g] (F_0 Females) 1099

A13. Individual Body Weights during Lactation [g] (F_0 Females) 1105

A14. Individual Body Weight Changes during Lactation [g] (F_0 Females) 1111

A15. Individual Food Consumption [g/animal/day] (F_0 Males) 1117

A16. Individual Food Consumption [g/kg/day] (F_0 Males) 1123

A17. Individual Food Consumption [g/animal/day] (F_0 Females) 1129

A18. Individual Food Consumption [g/kg/day] (F_0 Females) 1135

VOLUME 4 (continued) **Page**

A19. Individual Food Consumption during Gestation [g/animal/day]
(F_0 Females)....1141

A20. Individual Food Consumption during Gestation [g/kg/day]
(F_0 Females)....1147

A21. Individual Food Consumption during Lactation [g/animal/day]
(F_0 Females)....1153

A22. Individual Food Consumption during Lactation [g/kg/day]
(F_0 Females)....1159

A23. Individual Functional Observational Battery Data
(F_0 Males - Home Cage Observations - Pretest)....1165

A24. Individual Functional Observational Battery Data
(F_0 Males - Home Cage Observations - Week 4)....1169

A25. Individual Functional Observational Battery Data
(F_0 Females - Home Cage Observations - Pretest)....1173

A26. Individual Functional Observational Battery Data
(F_0 Females - Home Cage Observations - Lactation Day 4)....1177

A27. Individual Functional Observational Battery Data
(F_0 Females - Home Cage Observations - Post-Mating Day 25)....1181

A28. Individual Functional Observational Battery Data
(F_0 Females - Home Cage Observations - Post-Cohabitation Day 25)....1182

A29. Individual Functional Observational Battery Data
(F_0 Females - Home Cage Observations - Total Litter Loss)....1183

A30. Individual Functional Observational Battery Data
(F_0 Males - Handling Observations - Pretest)....1184

A31. Individual Functional Observational Battery Data
(F_0 Males - Handling Observations - Week 4)....1196

A32. Individual Functional Observational Battery Data
(F_0 Females - Handling Observations - Pretest)....1211

VOLUME 4 (continued) **Page**

A33. Individual Functional Observational Battery Data
(F_0 Females - Handling Observations - Lactation Day 4).....1220

A34. Individual Functional Observational Battery Data
(F_0 Females - Handling Observations - Post-Mating Day 25).....1232

A35. Individual Functional Observational Battery Data
(F_0 Females - Handling Observations - Post-Cohabitation Day 25).....1235

A36. Individual Functional Observational Battery Data
(F_0 Females - Handling Observations - Total Litter Loss).....1238

A37. Individual Functional Observational Battery Data
(F_0 Males - Open Field Observations - Pretest) 1241

A38. Individual Functional Observational Battery Data
(F_0 Males - Open Field Observations - Week 4).....1249

A39. Individual Functional Observational Battery Data
(F_0 Females - Open Field Observations - Pretest).....1257

A40. Individual Functional Observational Battery Data
(F_0 Females - Open Field Observations - Lactation Day 4).....1265

A41. Individual Functional Observational Battery Data
(F_0 Females - Open Field Observations - Post-Mating Day 25).....1273

A42. Individual Functional Observational Battery Data
(F_0 Females - Open Field Observations - Post-Cohabitation Day 25).....1275

A43. Individual Functional Observational Battery Data
(F_0 Females - Open Field Observations - Total Litter Loss).....1277

A44. Individual Functional Observational Battery Data
(F_0 Males - Sensory Observations - Pretest) 1279

A45. Individual Functional Observational Battery Data
(F_0 Males - Sensory Observations - Week 4).....1287

A46. Individual Functional Observational Battery Data
(F_0 Females - Sensory Observations - Pretest).....1295

VOLUME 4 (continued) **Page**

A47. Individual Functional Observational Battery Data
(F_0 Females - Sensory Observations - Lactation Day 4).....1303

A48. Individual Functional Observational Battery Data
(F_0 Females - Sensory Observations - Post-Mating Day 25).....1311

A49. Individual Functional Observational Battery Data
(F_0 Females - Sensory Observations - Post-Cohabitation Day 25).....1313

A50. Individual Functional Observational Battery Data
(F_0 Females - Sensory Observations - Total Litter Loss).....1315

A51. Individual Functional Observational Battery Data
(F_0 Males - Neuromuscular Observations - Pretest) 1317

A52. Individual Functional Observational Battery Data
(F_0 Males - Neuromuscular Observations - Week 4).....1325

VOLUME 5

A53. Individual Functional Observational Battery Data
(F_0 Females - Neuromuscular Observations - Pretest).....1335

A54. Individual Functional Observational Battery Data
(F_0 Females - Neuromuscular Observations - Lactation Day 4).....1343

A55. Individual Functional Observational Battery Data
(F_0 Females - Neuromuscular Observations - Post-Mating Day 25).....1351

A56. Individual Functional Observational Battery Data
(F_0 Females - Neuromuscular Observations - Post-Cohabitation Day 25) 1353

A57. Individual Functional Observational Battery Data
(F_0 Females - Neuromuscular Observations - Total Litter Loss).....1355

A58. Individual Functional Observational Battery Data
(F_0 Males - Physiological Observations - Pretest) 1357

A59. Individual Functional Observational Battery Data
(F_0 Males - Physiological Observations - Week 4).....1361

VOLUME 5 (continued) **Page**

A60. Individual Functional Observational Battery Data
(F_0 Females - Physiological Observations - Pretest).....1365

A61. Individual Functional Observational Battery Data
(F_0 Females - Physiological Observations - Lactation Day 4).....1369

A62. Individual Functional Observational Battery Data
(F_0 Females - Physiological Observations - Post-Mating Day 25).....1373

A63. Individual Functional Observational Battery Data
(F_0 Females - Physiological Observations - Post-Cohabitation Day 25).....1374

A64. Individual Functional Observational Battery Data
(F_0 Females - Physiological Observations - Total Litter Loss).....1375

A65. Individual Motor Activity Counts (F_0 Males).....1376

A66. Individual Motor Activity Counts (F_0 Females - Pretest).....1384

A67. Individual Motor Activity Counts (F_0 Females - Lactation Day 4).....1388

A68. Individual Motor Activity Counts (F_0 Females - Post-Mating Day 25).....1392

A69. Individual Motor Activity Counts
(F_0 Females - Post-Cohabitation Day 25).....1393

A70. Individual Motor Activity Counts (F_0 Females - Total Litter Loss).....1394

A71. Individual Hematology Values (F_0 Males).....1395

A72. Individual Hematology Values (F_0 Females - Lactation Day 4).....1411

A73. Individual Hematology Values (F_0 Females - Post-Mating Day 25).....1427

A74. Individual Hematology Values
(F_0 Females - Post-Cohabitation Day 25).....1431

A75. Individual Hematology Values (F_0 Females - Total Litter Loss).....1435

A76. Individual Serum Chemistry Values (F_0 Males).....1439

A77. Individual Serum Chemistry Values (F_0 Females - Lactation Day 4).....1447

VOLUME 5 (continued) **Page**

A78. Individual Serum Chemistry Values
(F_0 Females - Post-Mating Day 25).....1455

A79. Individual Serum Chemistry Values
(F_0 Females - Post-Cohabitation Day 25) 1457

A80. Individual Serum Chemistry Values (F_0 Females - Total Litter Loss).....1459

A81. Individual Special Chemistry Values (F_0 Males).....1461

A82. Individual Special Chemistry Values (F_0 Females - Lactation Day 4).....1465

A83. Individual Special Chemistry Values
(F_0 Females - Post-Mating Day 25).....1469

A84. Individual Special Chemistry Values
(F_0 Females - Post-Cohabitation Day 25) 1470

A85. Individual Special Chemistry Values (F_0 Females - Total Litter Loss).....1471

A86. Individual Reproductive Performance (F_0) 1472

A87. Individual Gestation Lengths [days] (F_0 Females).....1478

A88. Individual Dam Observations during Parturition (F_0 Females) 1479

A89. Individual Macroscopic and Microscopic Findings
(F_0 Males - Scheduled Necropsy).....1494

A90. Individual Macroscopic and Microscopic Findings
(F_0 Females - Unscheduled Death).....1562

A91. Individual Macroscopic and Microscopic Findings
(F_0 Females - Failed to Deliver) 1565

A92. Individual Macroscopic and Microscopic Findings
(F_0 Females - Total Litter Loss) 1572

A93. Individual Macroscopic and Microscopic Findings
(F_0 Females - Lactation Day 4) 1574

A94. Individual Corpora Lutea and Implantation Sites
(F_0 Females - Lactation Day 4) 1644

VOLUME 5 (continued) **Page**

A95. Individual Organ Weights and Final Body Weights [g]
(F_0 Males - Scheduled Necropsy).....1650

A96. Individual Organ Wts. Relative to Final Body Wts. [g/100 g]
(F_0 Males - Scheduled Necropsy).....1662

VOLUME 6

A97. Individual Organ Weights Relative to Brain Weights [g/100 g]
(F_0 Males - Scheduled Necropsy).....1676

A98. Individual Organ Weights and Final Body Weights [g]
(F_0 Females - Lactation Day 4) 1688

A99. Individual Organ Wts. Relative to Final Body Wts. [g/100 g]
(F_0 Females - Lactation Day 4) 1700

A100. Individual Organ Weights Relative to Brain Weights [g/100 g]
(F_0 Females - Lactation Day 4) 1712

A101. Individual Organ Weights and Final Body Weights [g]
(F_0 Females - Failed to Deliver) 1724

A102. Individual Organ Wts. Relative to Final Body Wts. [g/100 g]
(F_0 Females - Failed to Deliver) 1728

A103. Individual Organ Weights Relative to Brain Weights [g/100 g]
(F_0 Females - Failed to Deliver) 1732

F_1 LITTER GENERATION

A104. Individual Litter Viability (F_1) 1736

A105. Individual Pup Viability (F_1).....1743

A106. Individual Postnatal Survival (% per Litter) (F_1).....1752

A107. Individual Pup Clinical Observations (F_1) 1758

A108. Individual Offspring Weights [g] (F_1).....1823

A109. Individual Offspring Weight Changes [g] (F_1) 1858

A110. Individual Pup Necropsy Findings (F_1 - Unscheduled Deaths).....1892

1. SUMMARY

1.1. OBJECTIVE

This study was designed to evaluate the potential toxic effects of the test substance when administered to rats for a minimum of 28 days and to evaluate the potential of the test substance to affect male and female reproductive performance such as gonadal function, mating behavior, conception, parturition, and early postnatal development. In addition, a micronucleus assay was performed to assess the potential of the test substance to induce micronuclei in polychromatic erythrocytes (PCEs) in the rat bone marrow following at least 28 consecutive days of treatment administered by oral gavage. This assay evaluates compounds for *in vivo* clastogenic activity and/or disruption of the mitotic apparatus.

1.2. STUDY DESIGN

The test substance, naphthenic acid, in the vehicle, corn oil, was administered orally by gavage once daily to 3 groups (Groups 3-5) of Crl:CD(SD) rats, each group consisting of 12 males and 12 females. Dosage levels were 100, 300, and 900 mg/kg/day for Groups 3, 4, and 5, respectively. A concurrent vehicle control group (Group 2) of 12 rats/sex received the vehicle (corn oil) on a comparable regimen. A concurrent positive control group (Group 6), composed of 5 rats/sex, received a single oral dose of 60 mg/kg cyclophosphamide (CYC) on the day prior to scheduled euthanasia for bone marrow collection. The dosage volume was 10 mL/kg for all groups. A concurrent sham (control) group composed of 5 rats/sex was subjected to the same procedures (*i.e.* breeding) as the test substance-treated groups; however, no vehicle was administered to this group. Males and females were approximately 12 weeks of age at the beginning of test substance administration. Males received 14 daily doses prior to mating and continuing throughout the mating period for a total of 28-29 doses. Females received 14 daily doses prior to pairing and were dosed through lactation day 3 (for females that delivered) for a total of 39-53 doses; females with no evidence of mating/that failed to deliver were dosed through the day prior to euthanasia (post-mating or post-cohabitation day 25) for a total of 39-52 doses. All animals were observed twice daily for mortality and moribundity. Clinical observations, body weights, and food consumption were

recorded at appropriate intervals. Functional Observational Battery (FOB) and locomotor activity data were recorded for all males in the vehicle control, 100, 300, and 900 mg/kg/day groups prior to dosing and following approximately 28 days of dose administration and for all females in the vehicle control, 100, 300, and 900 mg/kg/day groups prior to dosing and on lactation day 4 for females that deliver or prior to euthanasia for females with total litter loss, no evidence of mating, or that failed to deliver. All F_0 females were allowed to deliver and rear their pups until lactation day 4. F_1 clinical observations and body weights were recorded on PND 1 and 4. Pups were necropsied on PND 4. Clinical pathology evaluations (hematology and serum chemistry) were performed on all surviving males and females in vehicle control and test substance-treated groups (including females with total litter loss and those that failed to deliver) at necropsy. F_0 males were euthanized following completion of the mating period and F_0 females that delivered, failed to deliver, and with a total litter loss were euthanized on lactation day 4, on post-mating day 25 or post-cohabitation day 25, and within 24 hours of when the total litter loss was recorded, respectively. Complete necropsies were conducted on all F_0 animals, and selected organs were weighed. Selected tissues were examined microscopically from all F_0 animals in the vehicle control (Group 2) and high-dose (Group 5) groups and from the female that was euthanized *in extremis*. In addition, the adrenals, kidney, liver, thymus, thyroid, and heart were examined from F_0 animals in the 100 and 300 mg/kg/day groups. Bone marrow collection for micronucleus evaluation was performed for all surviving F_0 animals at the scheduled euthanasia. Bone marrow smears were prepared and the coded slides from the first 5 animals/sex/group were counted for polychromatic, normochromatic, and micronucleated PCEs.

1.3. RESULTS

One female in the 900 mg/kg/day group was euthanized *in extremis* on lactation day 2, and the cause of death was determined to be the acute inflammation in the uterus and not a result of test substance administration. With the exception of 1 female in the 900 mg/kg/day group that was euthanized on lactation day 2 due to total litter loss, all other males and females at all dosage levels survived to the scheduled necropsies.

Test substance-related clinical findings noted in the surviving animals in the 900 mg/kg/day group generally consisted of hunched posture, rocking, lurching, and/or swaying while ambulating, walking on tiptoes, hypoactivity, and shallow respiration in the majority of females. In addition, single occurrences of tremors and rales were noted in the 900 mg/kg/day group females. In contrast, only hunched posture was observed for half of the males in the 900 mg/kg/day group. These clinical findings were noted at approximately 1 hour following dose administration primarily intermittently during the first 2 weeks of dose administration (study days 0-14) and were no longer observed by the detailed physical examinations on the following day. In addition, yellow material on the ventral abdominal, ventral thoracic, anogenital, and/or urogenital areas and red material around the mouth was observed for the majority of males and females in the 900 mg/kg/day group at the detailed physical examinations and/or approximately 1 hour following dose administration. At the detailed physical examinations, test substance-related higher incidences of hair loss on the left hindlimb, ventral abdominal, and ventral thoracic areas were observed for females in the 900 mg/kg/day group while hair loss on the ventral abdominal and urogenital areas was observed for the majority of males in this group. These clinical findings were noted as early as study day 7 and generally continued throughout the study. Hair loss is not considered to be toxicologically relevant and therefore the hair loss noted in the 900 mg/kg/day group was not considered to be adverse. Test substance-related, non-adverse, salivation or evidence thereof (clear material around the mouth, nose, and/or forelimbs) was noted in the 100, 300, and 900 mg/kg/day males and females at the detailed physical examinations, at the time of dosing, and/or approximately 1 hour following dose administration generally throughout the study.

Test substance-related lower mean body weight gains and/or reduced food consumption were noted for the F_0 males in the 900 mg/kg/day group during the treatment period and resulted in a mean body weight in this group that was 8.2% lower than the vehicle control group on study day 27. Although test substance-related reduced food consumption was noted for the F_0 females in the 100, 300, and 900 mg/kg/day groups throughout the

pre-mating period (study days 0-13), mean body weights in these groups were similar to the vehicle control group and there were no test substance-related effects on mean body weight gains noted at any dosage level. Therefore, these reductions in mean food consumption were not considered to be adverse. A test substance-related lower mean body weight gain was observed for the 900 mg/kg/day group females during gestation days 14-20 and consequently when the overall gestation treatment period (days 0-20) was evaluated. As a result, mean body weight in this group was 8.4% lower than the vehicle control group on gestation day 20. During the lactation treatment period, mean body weight gain in the 900 mg/kg/day group females was similar to the vehicle control group; however, lower mean body weights (7.6% lower) were noted in this group. The lower mean body weight noted in the 900 mg/kg/day group females was due to lower mean body weight gains observed during the last week of gestation and in the absence of an effect on mean body weight gain during lactation. Although lower mean food consumption was also noted in the 900 mg/kg/day group females during the lactation treatment period, in the absence of effects on mean body weight gains, the reduced food consumption was not considered adverse. Mean body weights and body weight gains in the 100 and 300 mg/kg/day group males and females and mean food consumption in the 100 and 300 mg/kg/day group males were unaffected by test substance administration during the respective treatment periods.

Test substance-related lower mean body weights were noted in the 900 mg/kg/day group males and females at the physiological observations during study week 4 and on lactation day 4, respectively. These body weight deficits corresponded to the lower mean body weight gains observed for the males during study days 0-27 and the females during the later part of gestation. Catalepsy and body temperature in the 900 mg/kg/day group males were unaffected by test substance administration. Physiological parameters in the 100 and 300 mg/kg/day males and females were unaffected by test substance administration. No other test substance-related effects were noted in the 100, 300, and 900 mg/kg/day groups during the FOB assessments. No test substance-related effects were noted on locomotor activity evaluations at any dosage level.

A test substance-related internal finding of pale kidneys was noted in the 900 mg/kg/day group males. At the scheduled necropsy, higher mean liver weights (absolute and/or relative) were noted in the 300 and 900 mg/kg/day group F_0 males and females and higher mean kidney weights (absolute and/or relative) were observed in the 300 mg/kg/day group males and 900 mg/kg/day group F_0 males and females. In addition, higher mean absolute and relative (to body and brain) thyroid/parathyroid weights were noted in the 900 mg/kg/day group F_0 males. Histopathologic examination of the F_0 animals at necrospy revealed cytoplasmic vacuolation of the zona fasciculata in the adrenal cortex of the 900 mg/kg/day group females and the 100, 300, and 900 mg/kg/day group males. Centrilobular hepatocellular hypertrophy was noted in the liver in the 900 mg/kg/day group males and females while unique to the 900 mg/kg/day group males was hyaline droplets and to the 300 and 900 mg/kg/day group males was hyaline droplet nephropathy in the kidneys. Epithelial hypertrophy and cytoplasmic vacuolation of the thyroid gland was observed in all test substance-treated groups and cortical lymphoid depletion in the thymus was observed in the 100 and 900 mg/kg/day group females. The test substance-related changes in the liver, thyroid, thymus, and adrenal glands were not considered to be adverse. The centrilobular hypertrophy in the liver was consistent with enzyme induction. The epithelial hypertrophy and cytoplasmic vacuolation in the thyroid was considered adaptive and the lymphoid cortical depletion in the thymus and adrenal cortical vacuolation are considered a result of stress. Although the test substance-related renal changes were considered to be adverse, they were considered specific to the species, and toxicologically unimportant in humans. Furthermore, the microscopic observations of hyaline droplets and hyaline droplet nephropathy are consistent with the accumulation of alpha 2u-globulins, however, immunohistochemical staining would be required for definitive identification of the eosinophilic proteinaceous droplets (Hard, 2008).

Test substance-related alterations in hematology parameters in the 900 mg/kg/day group males included decreases in red blood cell count, hemoglobin concentration, and hematocrit, and increases in platelet count, large unstained cell count, and red cell

distribution width when compared to the vehicle control group. In addition, an increase in the hemoglobin distribution width was noted in the 300 and 900 mg/kg/day group males. Test substance-related increases in the absolute white blood cell, lymphocyte, and/or monocyte counts were noted the 300 and 900 mg/kg/day group females. In the 900 mg/kg/day group, alterations in serum chemistry consisted of an increase in mean serum creatinine and decrease in serum chloride in the males and increases in mean serum albumin, total protein, serum glucose, serum cholesterol, and serum calcium in the females. In addition, an increase in the mean serum phosphorus was noted in the 300 and 900 mg/kg/day group females. All of the alterations in hematology and serum chemistry, were generally of small magnitude, were within the WIL historical control database ranges, and were considered toxicologically unimportant and non-adverse.

F_0 male and female mating and fertility, male copulation and female conception indices, mean number of days between pairing and coitus, gestation length, and the process of parturition were unaffected by test substance administration at all dosage levels. However, a test substance-related decrease in the mean number corpora lutea resulted in a reduction in the number of former implantation sites in the 900 mg/kg/day group compared to the vehicle control group. A slight reduction in the number of former implantation sites and as a result the mean number of pups born was observed in the 300 mg/kg/day group compared to the vehicle control group. Consequently, lower mean live litter sizes were noted in the 300 and 900 mg/kg/day groups. The mean number of F_1 pups born and live litter size in the 100 mg/kg/day group and percentage of males per litter at birth in the 100, 300, and 900 mg/kg/day groups were unaffected by test substance administration. Test substance-related lower postnatal survival was noted in the 900 mg/kg/day groups between birth and PND 4 and increased incidences of pups with a body cool to the touch and small stature were noted in the F_1 pups of in this group. Postnatal survival between birth and PND 4 and the general physical condition of the F_1 pups in the 100 and 300 mg/kg/day groups were unaffected by test substance administration. However, test substance-related lower mean male and female F_1 pup body weights and body weight gains were noted in the 900 mg/kg/day group during

PND 1-4. Necropsy findings for F_1 pups that were found dead or euthanized *in extremis* were not suggestive of any correlation with maternal administration of the test substance.

Naphthenic acid met the criteria for a negative response for the induction of bone marrow micronuclei under the conditions of this assay.

1.4. CONCLUSION

Adverse behavioral-related clinical findings, lower mean body weights, lower mean body weight gains, and/or reduced food consumption were noted in the 900 mg/kg/day group males and females during the treatment periods. Therefore, under the conditions of this screening study the no-observed-adverse-effect-level (NOAEL) for F_0 systemic toxicity was considered to be 300 mg/kg/day for males and females when naphthenic acid was administered orally by gavage to Crl:CD(SD) rats. Although a lower mean body weight gain was noted at the physiological observations in the 900 mg/kg/day group males during study week 4 and in the 900 mg/kg/day group females on lactation day 4, no other effects on FOB parameters and no effects on locomotor activity were noted at any dosage level. Based on these results, the NOAEL for F_0 neurobehavioral toxicity was 900 mg/kg/day for males and females. No test substance-related effects on F_0 reproductive performance, gestation length, parturition, or reproductive organs were noted at any dosage level. However, a lower mean number of corpora lutea and former implantation sites, lower mean number of pups born, and/or lower live litter size were noted in the 300 and 900 mg/kg/day groups. In addition, lower postnatal survival, increased incidences of body cool to the touch and small stature, and lower mean pup body weights and body weight gains were observed in the 900 mg/kg/day group. Based on these results, the NOAEL for F_0 reproductive toxicity and F_1 neonatal toxicity was considered to be 100 mg/kg/day. Naphthenic acid met the criteria for a negative response for the induction of bone marrow micronuclei under the conditions of this assay.

2. INTRODUCTION

2.1. GENERAL STUDY INFORMATION

This report presents the data from "A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats." Due to software spacing constraints, the study title is presented as "Oral Rat 28-Day & Developmental Tox Screening of Naphthenic Acid" on the report tables. For clarification of terminology used to differentiate the generations in the report text, the offspring of the F_0 generation were defined as the F_1 litters. On 29 July 2011, Jeffrey H. Charlap, MS assumed the role of Study Director originally held by Adam J. Kuhl, PhD.

The study protocol and deviations from the protocol are presented in Appendix A. A list of abbreviations potentially used in this report is presented in Section 13. (Abbreviations).

For the data collection process, each phase of the study was separated into what were termed WIL Research computer protocols. The computer protocol reference numbers and types of data collected were identified as follows:

Computer Protocol	Type of Data Collected
WIL-402011M	F_0 parental (male) data
WIL-402011F	F_0 parental (female) and F_1 litter data

2.2. KEY STUDY DATES[1]

Date(s)	Event(s)
7 September 2010	Study initiation date (date protocol signed by Study Director)
7 September 2010	Experimental starting date (animal receipt)
23 September 2010	Experimental start date (initiation of test substance administration)
23 September 2010 - 21 October 2010	Test substance administration (males)
23 September 2010 - 14 November 2010	Test substance administration (females)

[1] Date ranges represent the first and last dates of evaluation.

KEY STUDY DATES (CONTINUED)

Date(s)	Event(s)
6-20 October 2010	Mating period
22 October 2010	Last male necropsy
15 November 2010	Last lactation day 4 necropsy
7 February 2011	Experimental termination/completion date (last test substance characterization analysis)

2.3. CONTRIBUTING SCIENTISTS

Analytical Chemistry
[redacted]
WIL Research Laboratories LLC

Study Pathologist
[redacted]
WIL Research Laboratories, LLC

2.4. PRINCIPAL INVESTIGATORS AND TEST SITES

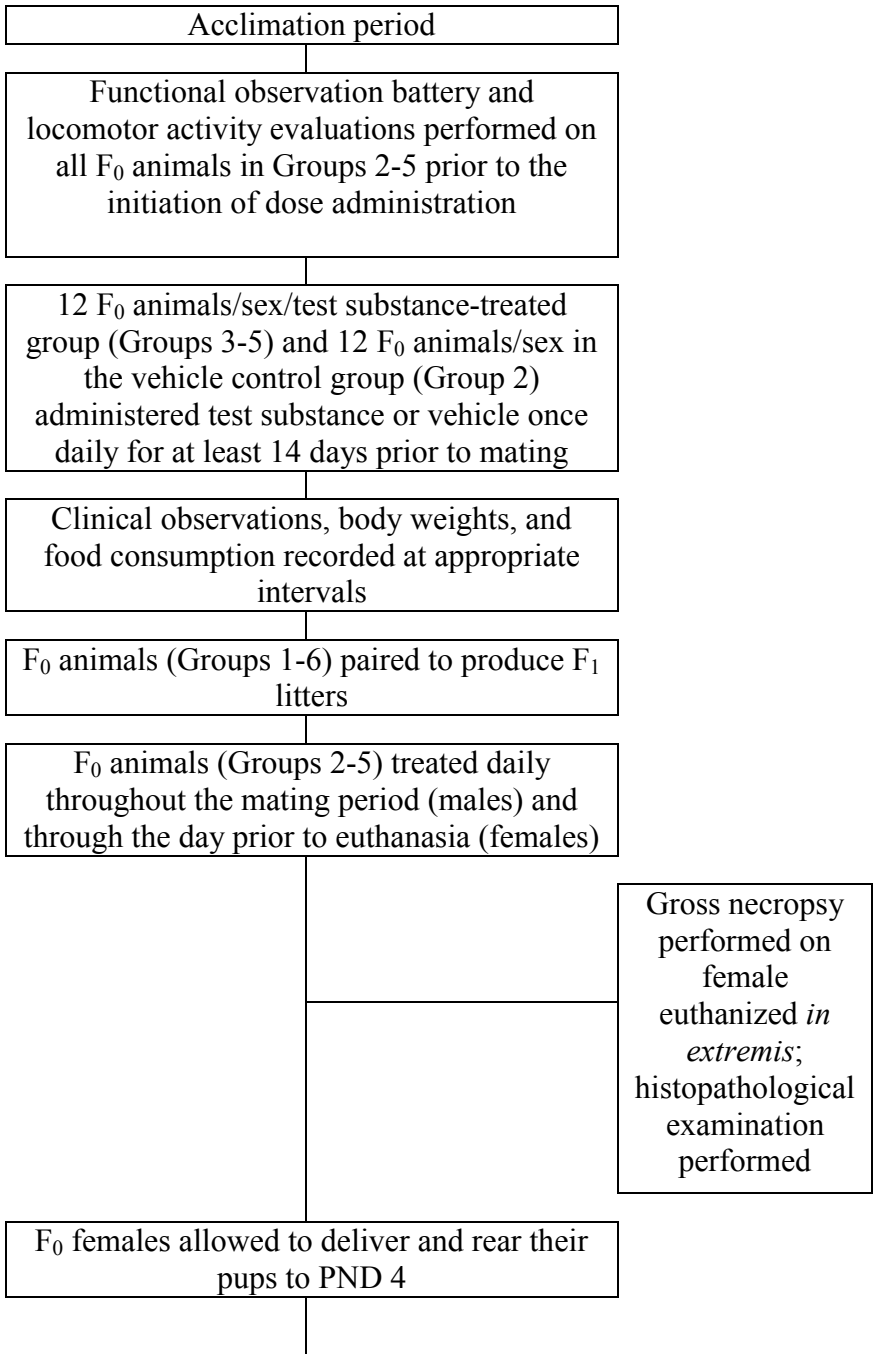
Micronucleus Test
[redacted]
Midwest BioResearch
Skokie, IL, 60077

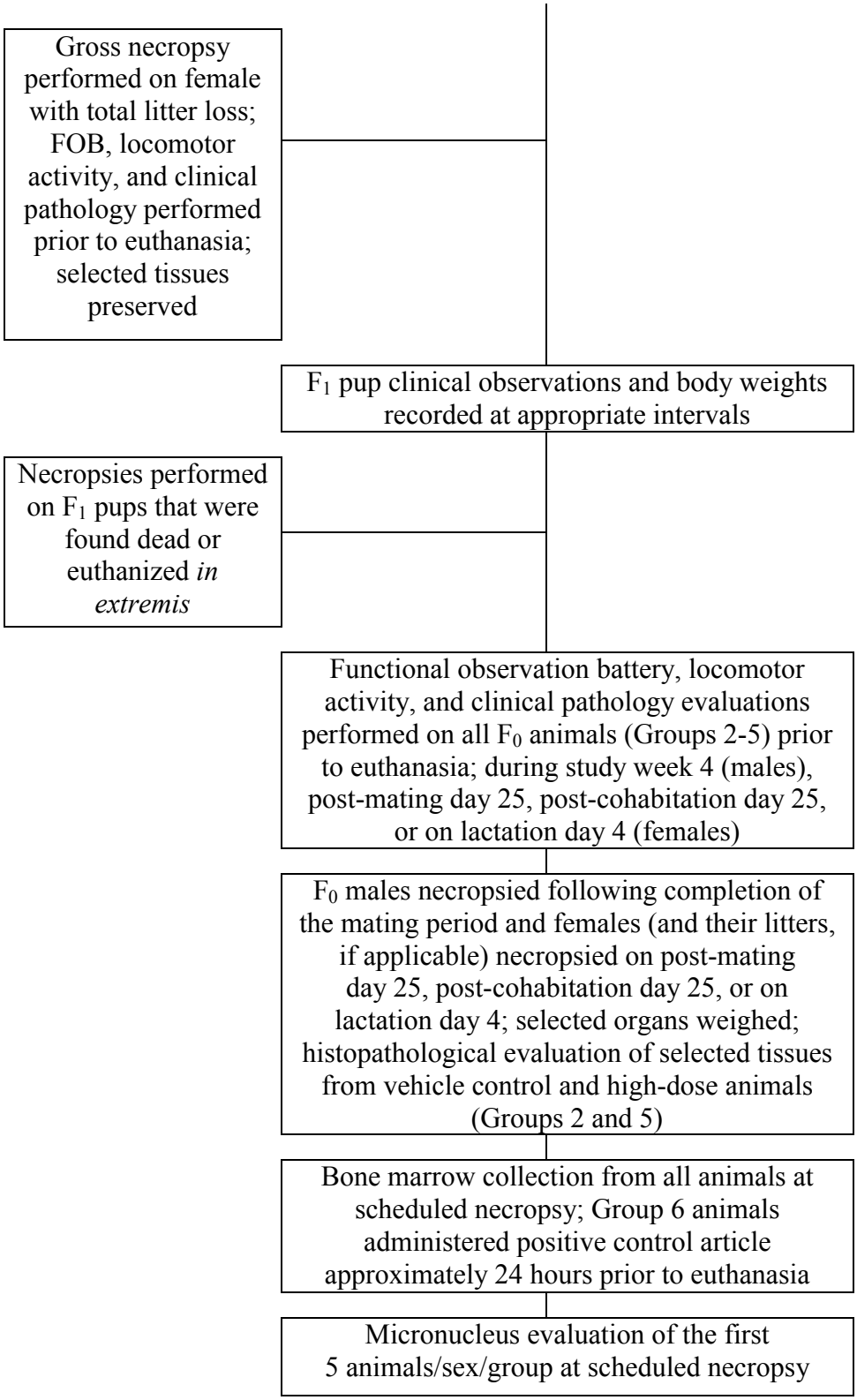
Statistical Analysis
[redacted]
BioSTAT Consultants, Inc.
Portage, MI 49024

2.5. WIL RESEARCH KEY STUDY PERSONNEL

[redacted]	Assistant Director, Analytical Chemistry
	Operations Manager, Pathology
	Senior Operations Manager, Vivarium
	Manager, Gross Pathology and Developmental Toxicology Laboratory
	Clinical Veterinarian
[redacted],	Vice President, Pathology
[redacted]	Group Manager, Formulations Laboratory
	Manager, Histology
	Vice President, Analytical, Metabolism, & *In Vitro* Toxicology Services
[redacted]	Director, Operations
	Manager, Clinical Pathology
	Operations Manager, Reporting & Technical Support Services

3. STUDY DESIGN




Gross necropsy performed on female with total litter loss; FOB, locomotor activity, and clinical pathology performed prior to euthanasia; selected tissues preserved
F_1 pup clinical observations and body weights recorded at appropriate intervals
Necropsies performed on F_1 pups that were found dead or euthanized *in extremis*
Functional observation battery, locomotor activity, and clinical pathology evaluations performed on all F_0 animals (Groups 2-5) prior to euthanasia; during study week 4 (males), post-mating day 25, post-cohabitation day 25, or on lactation day 4 (females)
F_0 males necropsied following completion of the mating period and females (and their litters, if applicable) necropsied on post-mating day 25, post-cohabitation day 25, or on lactation day 4; selected organs weighed; histopathological evaluation of selected tissues from vehicle control and high-dose animals (Groups 2 and 5)
Bone marrow collection from all animals at scheduled necropsy; Group 6 animals administered positive control article approximately 24 hours prior to euthanasia
Micronucleus evaluation of the first 5 animals/sex/group at scheduled necropsy

4. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

4.1. TEST SUBSTANCE, VEHICLE, AND POSITIVE CONTROL ARTICLE

4.1.1. TEST SUBSTANCE

The test substance, naphthenic acid, was received from EPL Archives, Inc., Sterling, VA, on behalf of the Sponsor, on 1 April 2010, as follows:

Identification	Physical Description
Naphthenic Acid Lot no. CP006002 CAS no.: 1338-24-5 [WIL ID no. 10006B]	Clear, dark yellow liquid

Characterization (pre- and post-study) of the test substance was performed at WIL Research; details about the methodology and results of these analyses are presented in Appendix B. Approximately 90% of the total mass of the test substance is accounted for in the same 14-16 carbon numbers, indicating that the material was likely stable for the duration of use. The purity of the test substance was 100%. The test substance was stored at room temperature, and according to the Material Safety Data Sheet, was considered stable under this condition (see Appendix C). A reserve sample of the test substance was collected and stored in the Archives at WIL Research.

4.1.2. VEHICLE

The vehicle used in preparation of the test substance formulations and for administration to the control group (Group 2) was corn oil (lot no. ZR0032, exp. date: 30 March 2012, manufactured by Spectrum Chemical Manufacturing Corporation, New Brunswick, NJ)

4.1.3. POSITIVE CONTROL ARTICLE

The positive control article, cyclophosphamide monohydrate (CYC), was received from Sigma Aldrich, Inc., St. Louis, MO, on 16 September 2010, as follows:

Identification	Physical Description
Cyclophosphamide monohydrate Lot no. 079K1569 Retest date:1 July 2012 CAS No.: 6055-19-2 [WIL ID no. 100143]	White powder

Documentation regarding the purity and stability of CYC is on file with the Sponsor and WIL Research. A Certificate of Analysis for CYC was provided by the supplier and is presented in Appendix C. The purity of CYC was 100.5%. CYC was stored refrigerated, and was considered stable under this condition.

4.1.4. PREPARATION

For the vehicle control group (Group 2), a sufficient amount of corn oil was transferred into a glass container. The vehicle was divided into aliquots for daily dispensation and stored at room temperature. The vehicle was mixed throughout preparation, sampling, and dose administration procedures.

Dosing formulations were prepared at the test substance concentrations indicated in the following table:

Group Number	Treatment	Dosage Level (mg/kg/day)	Test substance Concentration[a] (mg/mL)
1	Sham Control	0	0
2	Vehicle Control	0	0
3	Naphthenic Acid	100	10
4	Naphthenic Acid	300	30
5	Naphthenic Acid	900	90
6	Positive Control[b]	60	6

[a] = The dosing formulations were not adjusted for purity.
[b] = The positive control, cyclophosphamide, was administered to the animals in Group 6 approximately 24 hours prior to euthanasia for bone marrow collection.

The test substance formulations were prepared approximately weekly as single formulations for each dosage level, divided into aliquots for daily dispensation, and stored at room temperature. The test substance formulations were stirred continuously throughout the preparation, sampling, and dose administration procedures.

The first dosing formulations were visually inspected by the Study Director and were found to be visibly homogeneous and acceptable for administration.

The positive control article formulation was prepared on the day of dose administration. The formulation was stirred until homogenous and kept on wet ice after preparation and throughout dosing.

4.1.5. SAMPLING AND ANALYSES

Stability of the test substance in the vehicle prepared at concentrations of 3 and 100 mg/mL was confirmed following 11 days of room temperature storage (Kuhl, 2010, WIL-402010). Therefore, stability assessment was not conducted in the current study.

Prior to the initiation of dose administration, quadruplicate samples for homogeneity determination were collected from middle stratum of the vehicle control group and the

top, middle, and bottom strata of the 10, 30, and 90 mg/mL dosing formulation and quadruplicate samples for 8-day resuspension homogeneity were collected from the top and bottom strata of these same formulations. Quadruplicate samples for concentration analysis were collected from the middle stratum of each dosing formulation (including the vehicle control group) prepared during the study. One set of samples from each collection was subjected to the appropriate analyses. The remaining set of samples was stored at room temperature as back-up. All analyses were conducted by the Analytical Chemistry Department at WIL Research using a validated gas chromatography method using mass spectrometric detection. Details about the methodology and results of these analyses are presented in Appendix D, and the results are summarized in Section 6.1.

The positive control article is commercially available and the dosing formulations were not sampled for concentration analysis.

4.2. TEST SYSTEM, ANIMAL RECEIPT, AND ACCLIMATION PERIOD

Sexually mature male and virgin female Sprague Dawley [Crl:CD(SD)] rats were used as the test system on this study. The animal model, the Crl:CD(SD) rat, is recognized as appropriate for reproductive toxicity studies. In addition, significant reproductive historical control data are available for the Crl:CD(SD) rat. The number of animals selected for this study was consistent with the OECD and OPPTS guidelines for reproduction/developmental toxicity screening studies.

Crl:CD(SD) rats (66 males and 67 females) were received in good health from Charles River Laboratories, Inc., Raleigh, NC on 7 September 2010. The animals were approximately 69 days old upon receipt. Each animal was examined by a qualified biologist on the day of receipt. The day following receipt, all animals were weighed and clinical observations were recorded. Each rat was uniquely identified by a Monel® metal ear tag displaying the animal number. The animals were housed for an acclimation period of 16 days prior to the first day of treatment. During the acclimation period, the animals were observed twice daily for mortality and general changes in appearance and

behavior. For all males, the testes were palpated at least once during the quarantine period.

4.3. ANIMAL HOUSING

Following receipt and until pairing, all F_0 animals were housed individually in clean, stainless steel wire-mesh cages suspended above cage-board. The cage-board was changed at least 3 times per week. The rats were paired for mating in the home cage of the male. Following positive evidence of mating, the males were housed in suspended wire-mesh cages until the scheduled necropsy, and the females were transferred to plastic maternity cages with nesting material, ground corncob bedding (Bed-O'Cobs®; The Andersons, Cob Products Division, Maumee, OH). The nesting material is periodically analyzed by the manufacturer for contaminants. No contaminants were present in the bedding at concentrations sufficient to interfere with the outcome of the study. The results of these analyses are maintained at WIL Research. The dams and their litters were housed in these cages until euthanasia on lactation day 4. Females with no evidence of mating or that failed to deliver were housed in plastic maternity cages until post-cohabitation or post-mating day 25. Animals were maintained in accordance with the *Guide for the Care and Use of Laboratory Animals* (National Research Council, 1996). The animal facilities at WIL Research are accredited by AAALAC International.

4.4. DIET, DRINKING WATER, AND MAINTENANCE

The basal diet used in this study, PMI Nutrition International, LLC Certified Rodent LabDiet® 5002, was a certified feed with appropriate analyses performed by the manufacturer and provided to WIL Research. Feed lots used during the study were documented in the study records. Feeders were changed and sanitized once per week. Municipal water supplying the facility was sampled for contaminants according to WIL Research's SOPs. No contaminants were present in animal feed or water at concentrations sufficient to interfere with the objectives of this study. Reverse osmosis-purified (on-site) drinking water, delivered by an automatic watering system, and the basal diet were provided *ad libitum* throughout the acclimation period and during

the study except during the period of fasting for all F_0 males prior to clinical pathology blood collection when food, but not water, was withheld.

4.5. ENVIRONMENTAL CONDITIONS

All rats were housed throughout the acclimation period and during the study in an environmentally controlled room. The room temperature and humidity controls were set to maintain environmental conditions of 71°F ± 5°F (22°C ± 3°C) and 50% ± 20% relative humidity. Room temperature and relative humidity data were monitored continuously and were scheduled for automatic collection on an hourly basis. These data are summarized in Appendix E. Actual mean daily temperature ranged from 70.6°F to 71.2°F (21.4°C to 21.8°C) and mean daily relative humidity ranged from 39.3% to 54.4% during the study. Fluorescent lighting provided illumination for a 12-hour light (0600 hours to 1800 hours)/12-hour dark photoperiod. Lighting conditions were recorded every 15 minutes. Air handling units were set to provide a minimum of 10 fresh air changes per hour.

4.6. ASSIGNMENT OF ANIMALS TO TREATMENT GROUPS

At the conclusion of the acclimation period, all available males and females were weighed and examined in detail for physical abnormalities. At the discretion of the Study Director, each animal judged to be in good health and meeting acceptable body weight requirements was selected for use in the computerized randomization procedure. At that time, the individual body weights and corresponding animal identification numbers were entered into WTDMS™. A printout containing the animal numbers, corresponding body weights, and individual group assignments was generated that ensured homogeneity of group means and variances for body weight. The animals then were arranged into groups according to the printout. Animals not assigned to study were transferred to the WIL Research stock colony.

The experimental design for this study consisted of 3 test substance-treated groups and 1 vehicle control group composed of 12 rats/sex/group and 1 sham control and 1 positive control group composed of 5 rats/sex/group. At the initiation of dose administration

(study day 0), the males and females were approximately 12 weeks old; body weights ranged from 335 g to 448 g and from 212 g to 273 g for males and females, respectively, on study day 0. The animals were approximately 14 weeks old when paired on study day 13; female body weights ranged from 224 g to 312 g on gestation day 0.

4.7. ORGANIZATION OF TEST GROUPS, DOSAGE LEVELS, AND TREATMENT REGIMEN

The vehicle, test substance, and positive control formulations were administered orally by gavage, via an appropriately sized flexible, Teflon®-shafted, stainless steel ball-tipped dosing cannula (Natume, Japan) once daily. The males were dosed during study days 0-28 (14 days prior to pairing and continuing throughout the mating period) for a total of 28-29 doses. The females were dosed during study days 0 through the day prior to euthanasia (14 days prior to pairing through lactation day 3) for a total of 39-53 doses. Females with no evidence of mating or that failed to deliver were dosed through the day prior to euthanasia (post-mating or post-cohabitation day 25) for a total of 39-52 doses. The positive control group (Group 6) was dosed approximately 24 hours prior to euthanasia for bone marrow collection. The dosage volume for Groups 2-6 was 10 mL/kg. Individual dosages were based on the most recently recorded body weights to provide the correct mg/kg/day dose. All animals were dosed at approximately the same time each day.

The following table presents the study group assignment:

Group Number	Treatment	Dosage Level (mg/kg/day)	Dosage Volume (mL/kg)	Number of Males	Number of Females
1	Sham Control	0	0	5	5
2	Vehicle Control	0	10	12	12
3	Naphthenic Acid	100	10	12	12
4	Naphthenic Acid	300	10	12	12
5	Naphthenic Acid	900	10	12	12
6	Cyclophosphamide	60	10	5	5

Dosage levels were selected based on results of a previous 14-day and pilot prenatal developmental toxicity study (Kuhl, 2010, WIL-402010). In this study, behavioral-related clinical findings including hunched posture, rocking, lurching, or swaying while ambulating, and prostration were observed in the 1000 mg/kg/day group females at the daily examinations and/or approximately 1 hour following dose administration. Test substance-related lower mean body weights, reduced food consumption, increased absolute and relative (to final body weight) kidney and liver weights, and decreased mean absolute and/or relative (to final body weight) thymus weights were noted in the 1000 mg/kg/day group males and females. In addition, lower mean absolute ovarian weights were noted in the 1000 mg/kg/day group females. In the 300 mg/kg/day group males, a higher mean absolute and relative (to final body weight) liver weight was also observed. Two females in the 1000 mg/kg/day group had completely resorbed litters and 1 female had a litter composed of 2 dead fetuses and 1 early resorption. An increase in the mean litter proportions of pre-implantation and postimplantation loss were noted in the 1000 mg/kg/day group which corresponded to a decrease in the mean number and litter proportion of viable fetuses. No treatment-related effects on external fetal malformations and no developmental variations were noted in this study at any dosage level evaluated. Based on these results, dosage levels of 100, 300, and 900 mg/kg/day were selected for the current study.

The selected route of administration for this study was oral (gavage) because this is the potential route of human exposure. Historically this route has been used extensively for studies of this nature.

5. PARAMETERS EVALUATED

5.1. CLINICAL OBSERVATIONS AND SURVIVAL

All rats were observed twice daily, once in the morning and once in the afternoon, for moribundity and mortality. Detailed physical examinations were recorded for all parental (F_0) animals on a weekly basis throughout the study. Each F_0 male and female was also observed for signs of toxicity approximately 1 hour following dose administration. The absence or presence of findings was recorded for individual animals. In addition, the presence of findings at the time of dose administration was recorded for individual animals. Females expected to deliver were also observed twice daily during the period of expected parturition and at parturition for dystocia (prolonged labor, delayed labor) or other difficulties.

5.2. BODY WEIGHTS

Individual F_0 male body weights were recorded weekly beginning 1 week prior to test substance administration, on the first day of dose administration, weekly thereafter throughout the study, and prior to the scheduled euthanasia. Individual female body weights were recorded weekly beginning 1 week prior to test substance administration, on the first day of dose administration, and weekly thereafter until evidence of copulation was observed. Mean weekly body weights and body weight changes are presented for each interval. In addition, cumulative mean body weight changes are presented for the pre-mating period (males and females) and for the entire F_0 treatment period (males only). Once evidence of mating was observed, female body weights were recorded on gestation days 0, 4, 7, 11, 14, 17, and 20 and on lactation days 0 (when possible), 1, and 4. Mean gestation body weights and corresponding mean body weight changes are presented for these intervals and for the overall gestation interval (days 0-20); mean lactation body weight changes are presented for lactation days 1-4. Weekly body weights for females for which there was no evidence of mating are presented in the individual report tables until necropsy. When body weights could not be determined for an animal during a given interval (due to an unscheduled death, as females enter gestation/lactation, weighing error, *etc*.), group mean values were calculated for that interval using the

available data. The time periods when body weight values were unavailable for a given animal were left blank or designated as "NA" on the individual report tables.

5.3. FOOD CONSUMPTION

Individual F_0 male and female food consumption was recorded 1 week prior to the initiation of dose administration, on the first day of dose administration, and weekly until cohabitation. Food intake was not recorded during the mating period. Once evidence of mating was observed, female food consumption was recorded on gestation days 0, 4, 7, 11, 14, 17, and 20 and on lactation days 1 and 4. Following mating, food consumption for females with no evidence of mating was measured on a weekly basis until the scheduled euthanasia. Weekly food consumption for females for which there was no evidence of mating is presented in the individual report tables until necropsy. Food consumption was reported as g/animal/day and g/kg/day for the corresponding body weight change intervals. Calculation of the comprehensive intervals excludes all erroneous values such as total food spillage.

When food consumption could not be determined for an animal during a given interval (due to an unscheduled death, weighing error, food spillage, *etc*.), group mean values were calculated for that interval using the available data. The time periods when food consumption values were unavailable for a given animal were left blank or designated as "NA" on the individual report tables.

5.4. BREEDING PROCEDURES

The animals were paired on a 1:1 basis within each treatment group following 14 days of treatment for the F_0 males and females. A breeding record containing the male and female identification numbers and the start date of cohabitation was maintained. Each female was housed in the home cage of the male. Positive evidence of mating was confirmed by the presence of a vaginal copulatory plug or the presence of sperm following a vaginal lavage and verified by a second biologist. Each mating pair was examined daily. The day when evidence of mating was identified was termed gestation

day 0. If evidence of copulation was not detected after 14 days of pairing, any females that had not shown evidence of mating were placed in plastic maternity cages.

For the purpose of calculating pre-coital intervals, rats paired over a 12-hour dark cycle were considered to have been paired for 1 day.

Mating, fertility, and copulation/conception indices were calculated as follows:

$$\text{Male (Female) Mating Index (\%)} = \frac{\text{No. of Males (Females) with Evidence of Mating (or Confirmed Pregnancy)}}{\text{Total No. of Males (Females) Used for Mating}} \times 100$$

$$\text{Male Fertility Index (\%)} = \frac{\text{No. of Males Siring a Litter}}{\text{Total No. of Males Used for Mating}} \times 100$$

$$\text{Male Copulation Index (\%)} = \frac{\text{No. of Males Siring a Litter}}{\text{No. of Males with Evidence of Mating (or Females with Confirmed Pregnancy)}} \times 100$$

$$\text{Female Fertility Index (\%)} = \frac{\text{No. of Females with Confirmed Pregnancy}}{\text{Total No. of Females Used for Mating}} \times 100$$

$$\text{Female Conception Index (\%)} = \frac{\text{No. of Females with Confirmed Pregnancy}}{\text{No. of Females with Evidence of Mating (or Confirmed Pregnancy)}} \times 100$$

5.5. PARTURITION

All females were allowed to deliver naturally and rear their young to PND 4. During the period of expected parturition, the females were observed twice daily for initiation and completion of parturition and for signs of dystocia. On the day parturition was initiated (PND 0), pups were sexed and examined for gross malformations, and the numbers of stillborn and live pups were recorded. Individual gestation length was calculated using the date delivery started.

5.6. FOB ASSESSMENTS

FOB assessments were recorded for all F_0 males and females in the vehicle control (Group 2), 100, 300, and 900 mg/kg/day groups prior to the initiation of dose

administration, following approximately 28 days of dose administration (study week 4) for F_0 males, and prior to euthanasia for F_0 females (including those with total litter loss and who failed to deliver; presented on the individual tables only). The FOB used at WIL Research is based on previously developed protocols (Gad, 1982; Haggerty, 1989; Irwin, 1968; Moser *et al*., 1988, Moser *et al*., 1991, and O'Donoghue, 1989). FOB Testing was performed by the same biologists, to the extent possible, without knowledge of the animal's group assignment. The FOB was performed in a sound-attenuated room equipped with a white noise generator set to operate at 70 ± 10 dB. All animals were observed for the following parameters as described below (refer to Appendix F for a detailed description of the scoring criteria used for each observation and to Appendix G for positive control/validation data):

5.6.1. HOME CAGE OBSERVATIONS

Posture	Biting
Convulsions/Tremors	Palpebral (eyelid) closure
Feces consistency	

5.6.2. HANDLING OBSERVATIONS

Ease of removal from cage	Ease of handling animal in hand
Lacrimation/Chromodacryorrhea	Salivation
Piloerection	Fur appearance
Palpebral closure	Respiratory rate/character
Eye prominence	Mucous membranes/Eye/Skin color
Red/Crusty deposits	Muscle tone

5.6.3. OPEN FIELD OBSERVATIONS

Mobility	Gait
Rearing	Arousal
Convulsions/Tremors	Urination/Defecation
Grooming	Gait score
Bizarre/Stereotypic behavior	Backing
Time to first step (seconds)	

Note: Open field observations were evaluated over a 2-minute observation period.

5.6.4. SENSORY OBSERVATIONS

Approach response	Touch response
Startle response	Tail pinch response
Pupil response	Eyeblink response
Forelimb extension	Hindlimb extension
Air righting reflex	Olfactory orientation

5.6.5. NEUROMUSCULAR OBSERVATIONS

Hindlimb extensor strength	Grip strength-hind and forelimb
Hindlimb foot splay	Rotarod performance

Forelimb and hindlimb grip strength were measured using a device similar to the one described by Meyer *et al*. (1979). The animal was allowed to grip a T-shaped grip bar with its forepaws and was pulled back gently along a platform until its grip was broken. As the backward locomotion continues, the animal's hindpaws reach a T-shaped rearlimb grip bar, which it is allowed to grasp and then forced to release by continued pulling. Mark-10 series EG digital force gauges (Mark-10 Corporation, Copiague, NY) were used to record the maximum strain required to break forelimb and hindlimb grip. The average of 3 valid measurements was taken as the animal's score for each grip strength measure.

5.6.6. PHYSIOLOGICAL OBSERVATIONS

Catalepsy	Body weight
Body temperature	

5.7. LOCOMOTOR ACTIVITY

Locomotor activity counts were recorded for all F_0 males and females in the vehicle control (Group 2), 100, 300, and 900 mg/kg/day groups prior to the initiation of dose administration, following approximately 28 days of dose administration (study week 4) for F_0 males, and prior to euthanasia for F_0 females (including those with total litter loss and who failed to deliver; presented on the individual tables only). Locomotor activity, recorded after the completion of the FOB, was measured automatically using a personal computer-controlled system utilizes a series of infrared photobeams surrounding a clear plastic, rectangular cage to quantify each animal's motor activity. Four-sided black

plastic enclosures were used to surround the transparent plastic boxes to decrease the potential for distraction from extraneous environmental stimuli or stimuli from biologists or adjacent animals. The black enclosures rested on top of the photobeam frame and did not interfere with the path of the beams. The testing of treatment groups was done according to replicate sequence. Each animal was tested separately. Data were collected in 5-minute epochs and the test session duration was 60 minutes. These data were compiled as six, 10-minute subintervals for tabulation.

Data for ambulatory and total motor activity were tabulated. Total motor activity was defined as a combination of fine motor skills (*i.e.*, grooming, interruption of 1 photobeam) and ambulatory motor activity (interruption of 2 or more consecutive photobeams). Refer to Appendix G for motor activity validation and positive control data.

5.8. CLINICAL PATHOLOGY

Blood samples for clinical pathology evaluations (hematology and serum chemistry) were collected from all surviving F_0 animals in the vehicle control (Group 2), 100, 300, and 900 mg/kg/day groups at the scheduled necropsies (following a minimum of 28 days of dose administration, males and lactation day 4, females), and from the F_0 female with a total litter loss prior to euthanasia (presented on individual tables only). The F_0 males were fasted overnight prior to blood collection. Blood for serum chemistry and hematology was collected from the retro-orbital sinus following isoflurane anesthesia. Blood for coagulation parameters was collected from the vena cava at the time of necropsy. Blood was collected into tubes containing EDTA (hematology) or no anticoagulant (serum chemistry). Clinical pathology methods, procedures, and references are presented in Appendix H. The interpretation of the clinical pathology data is presented in Appendix I. The following parameters were evaluated:

5.8.1. HEMATOLOGY AND COAGULATION

Total leukocyte count (WBC)
Erythrocyte count (RBC)
Hemoglobin (HGB)
Hematocrit (HCT)
Mean corpuscular volume (MCV)
Mean corpuscular hemoglobin (MCH)
Mean corpuscular hemoglobin concentration (MCHC)
Platelet count (PLATELET)
Prothrombin time (PT)
Activated partial thromboplastin time (APTT)
Reticulocyte count
  Percent (RETIC)
  Absolute (RETIC ABSOLUTE)
Mean Platelet Volume (MPV)
Red cell distribution width (RDW)
Hemoglobin Distribution Width (HDW)
Differential leukocyte count -
  Percent and absolute
  -Neutrophil (NEU)
  -Lymphocyte (LYMPH)
  -Monocyte (MONO)
  -Eosinophil (EOS)
  -Basophil (BASO)
  -Large unstained cell (LUC)
Platelet estimate[a]
Red cell morphology (RBC Morphology)[a]

( ) - Designates tabular abbreviation
[a] - Presented on individual tables if a manual differential was performed, and the manual data were accepted and reported instead of the automated differential data

5.8.2. SERUM CHEMISTRY

Albumin
Total protein
Globulin [by calculation]
Albumin/globulin ratio (A/G Ratio) [by calculation]
Total bilirubin (Total Bili)
Urea nitrogen
Creatinine
Alkaline phosphatase (ALP)
Alanine aminotransferase (ALT)
Aspartate aminotransferase (AST)
Gamma glutamyltransferase (GGT)
Glucose
Total cholesterol (Cholesterol)
Calcium
Chloride
Phosphorus
Potassium
Sodium
Triglycerides (Triglyceride)
Bile acids[a]

( ) - Designates tabular abbreviation
[a] - Presented on special chemistry tables

5.9. ANATOMIC PATHOLOGY

5.9.1. MACROSCOPIC EXAMINATIONS

All F_0 adults were euthanized by carbon dioxide inhalation. Males were euthanized following completion of the mating period. Females that delivered were euthanized on lactation day 4; the number of former implantation sites and corpora lutea were recorded. Females that failed to deliver were euthanized on post-mating day 25 (females with evidence of mating) or post-cohabitation day 25 (females with no evidence of mating). Uteri with no macroscopic evidence of implantation were opened and subsequently placed in 10% ammonium sulfide solution for detection of early implantation loss (Salewski, 1964). Females with total litter loss were euthanized within 24 hours of litter loss.

Necropsies were performed on all animals euthanized *in extremis* or that survived to the scheduled necropsy and included examination of the external surface, all orifices, the external surface of the brain, and the cranial, thoracic, abdominal, and pelvic cavities, including viscera. At the time of necropsy, the following tissues and organs were placed in 10% neutral-buffered formalin (except as noted):

Adrenals (2)
Aorta
Bone with marrow (sternebrae)[a]
Bone marrow smear[a]
Brain
  Cerebrum (2 levels)
  Cerebellum with pons/medulla
Coagulating gland
Eyes with optic nerves (2)[c]
Gastrointestinal tract
  Esophagus
  Stomach
  Duodenum
  Jejunum
  Ileum
  Cecum
  Colon
  Rectum
Heart
Kidneys (2)
Left femur[b]
Liver (sections of 2 lobes)
Lungs (including bronchi, fixed by inflation with fixative)
Lymph node
  Axillary (2)
  Mesenteric
  Mandibular (2)
Ovaries (2) with oviducts
Pancreas
Peripheral nerve (sciatic)
Pituitary
Prostate
Salivary glands [mandibular (2)]
Seminal vesicles (2)
Skeletal muscle (rectus femoris)
Skin with mammary gland[d]
Spinal cord (cervical)
Spleen
Testes with epididymides[e] (2)
Thymus
Thyroids [with parathyroids, if present (2)]
Trachea
Urinary bladder
Uterus[f] with cervix and vagina
Gross lesions (all groups, when possible)

[a] = Bone marrow from the right femur was collected and processed from all F_0 animals at the scheduled necropsy and euthanized *in extremis* from all groups (with the exception of found dead and vehicle control animals euthanized *in extremis*) for the micronucleus assay. Slides from the first 5 animals/group were used for micronucleus assay evaluation.

[b] = Bone marrow smears from the left femur (intended for histological examination) were not placed in formalin, slides were not examined.

[c] = Fixed in Davidson's solution.

[d] = For females; a corresponding section of skin was taken from the same anatomical area for males.

[e] = Fixed in Bouin's solution.

[f] = Any uterus that was placed in 10% ammonium sulfide solution for detection of implantation sites was discarded and not preserved in 10% neutral-buffered formalin.

5.9.2. ORGAN WEIGHTS

The following organs were weighed from all F_0 males at the scheduled necropsy and F_0 females on lactation day 4, post-mating day 25, or post-cohabitation day 25:

Adrenals	Ovaries with oviducts
Brain	Spleen
Epididymides[a]	Testes[a]
Heart	Thymus
Kidneys	Thyroids with parathyroids[b]
Liver	Uterus with vagina
Lungs	

[a] = These paired organs were weighed separately.
[b] = Fixed in 10% neutral-buffered formalin prior to weighing.

Except as noted, paired organs were weighed together. Absolute weights and organ to final body weight and brain weight ratios were reported. When organ weights could not be determined for an animal (due to weighing error, lost or damaged organ, *etc*.), group mean values were calculated using the available data. The organs for which weights could not be determined were designated as "NA" on the individual report tables.

5.9.3. MICROSCOPIC EXAMINATIONS

After fixation, protocol-specified tissues were trimmed according to WIL Research's SOPs and the protocol. Trimmed tissues were processed into paraffin blocks, sectioned at 4 to 8 microns, mounted on glass microscope slides, and stained with hematoxylin and eosin. Sections of the testes and epididymides were also stained with PAS and hematoxylin.

Microscopic examination was performed on all tissues listed in Section 5.9.1. from all animals in the vehicle control (Group 2) and 900 mg/kg/day groups at the scheduled necropsies. In addition, the adrenals, kidney, liver, thymus, thyroid, and heart were examined in the 100 and 300 mg/kg/day groups. Missing tissues were identified as not found at necropsy, lost at necropsy, lost during processing, not in plane of section, or other reasons as appropriate. Tissues may appear on the report tables as not examined

due to the tissue not being in the plane of section, not present at trimming, *etc*. The pathology report is presented in Appendix I.

5.10. MICRONUCLEUS EVALUATION

Bone marrow was collected from all F_0 animals (including the female euthanized *in extremis*) at the time of euthanasia from the right femur of animals euthanized by inhalation of carbon dioxide. Bone marrow was aspirated or flushed 2 to 3 times from the right femur into a centrifuge tube using a syringe containing heat inactivated fetal bovine serum (HI FBS). The bone marrow was centrifuged and all but approximately 0.25 mL (or a volume approximately twice that of the cell pellet) of HI FBS was decanted, and the pellet was resuspended in the remaining HI FBS. Bone marrow smears were prepared by placing approximately 1 drop of cell suspension onto a minimum of 2 appropriately labeled, clean microscope slides. Each slide was coded so that the treatment group would not be revealed during subsequent analysis. The slides were air dried, fixed in 100% methanol for approximately 20 minutes, and allowed to air dry a second time. The slides were stored refrigerated until shipped at ambient temperature to Midwest BioResearch, LLC, Skokie, IL.

Prior to analysis, the coded slides were stained with either Giemsa or acridine orange (A/O) staining solution (Hayashi et al., 1983) and placed in numerical order using the animal numbers. Three separate evaluations were made for each slide: 1) a total of 1000 erythrocytes (both polychromatic erythrocytes [PCEs] and normochromatic erythrocytes [NCEs]) per animal were counted and the PCE:total erythrocytes [TE] ratio was determined; 2) the number of micronucleated PCEs from a total of 2000 PCEs was scored per animal, and 3) the number of micronucleated NCEs from a total of 2000 NCEs was scored per animal. In addition, the vehicle control values were within Midwest BioResearch, LLC, historical control reference range values (Appendix J) and were less than 0.4% micronucleated PCEs. A detailed description of the methods and the results of these evaluations are presented in Appendix K.

5.11. F_1 LITTER PARAMETERS

5.11.1. LITTER VIABILITY AND DEATHS

Each litter was examined daily for survival, and all deaths were recorded. All pups were individually identified by application of tattoo markings on the digits following completion of parturition. A daily record of litter size was maintained. Intact offspring found dead or euthanized *in extremis* were necropsied using a fresh dissection technique, which included examination of the heart and major vessels (Stuckhardt and Poppe, 1984). For each pup found dead on PND 0 or 1 (pups not cannibalized or too autolyzed to examine), the lungs were removed and placed in a saline-filled jar. If the lungs sank to the bottom of the jar, the pup was considered stillborn (dead on PND 0) unless the pup had previously been noted as alive. Tissues were preserved in 10% neutral-buffered formalin for possible future histopathologic examination only as deemed necessary by the gross findings. The carcass of each pup was then discarded. Pups not expected to survive to the next observation period (moribund) were euthanized via an intraperitoneal injection of sodium pentobarbital and necropsied.

5.11.2. CLINICAL OBSERVATIONS

Litters were examined daily for survival and any adverse changes in appearance or behavior. Each pup received a detailed physical examination on PND 1 and 4. Any abnormalities in nursing behavior were recorded.

5.11.3. BODY WEIGHTS

Pups were individually weighed on PND 1 and 4. Mean pup weights were presented by sex for each litter and by dose group. When body weights could not be determined for a pup during a given interval (due to an unscheduled death, weighing error, *etc*.), group mean values were calculated for that interval using the available data. The time periods a given pup was not weighed were left blank or designated as "NA" on the individual report tables.

5.11.4. SEX DETERMINATION

Pups were individually sexed on PND 0 and 4.

5.11.5. CALCULATION OF LITTER PARAMETERS

Litter parameters were defined as follows:

$$\text{Mean Live Litter Size} = \frac{\text{Total No. of Viable Pups on PND 0}}{\text{No. of Litters with Viable Pups PND 0}}$$

$$\text{Postnatal Survival Between Birth and PND 0 or PND 4 (Pre-selection) (\% Per Litter)} = \frac{\text{Sum of (Viable Pups Per Litter on PND 0 or PND 4 [Pre-selection]/No. of Pups Born Per Litter)}}{\text{No. of Litters Per Group}} \times 100$$

$$\text{Postnatal Survival for All Other Intervals (\% Per Litter)} = \frac{\text{Sum of (Viable Pups Per Litter at End of Interval N/Viable Pups Per Litter at Start of Interval N)}}{\text{No. of Litters Per Group}} \times 100$$

Where N = PND 0-1 and 1-4

Total litter loss was determined when the last pup in the litter was found dead or euthanized *in extremis* prior to the scheduled euthanasia.

5.11.6. SCHEDULED EUTHANASIA

On PND 4, surviving F_1 rats were euthanized via an intraperitoneal injection of sodium pentobarbital and discarded without examination.

5.12. DATA ACQUISITION AND ANALYSIS

5.12.1. ACQUISITION AND REPORTING

Program/System	Description
Archive Management System (AMS)	In-house developed application for storage, maintenance, and retrieval of information for archived materials (*e.g.*, lab books, study data, wet tissues, slides, *etc*.)
InSight® Publisher	Electronic publishing system (output is Adobe Acrobat, PDF)
Master Schedule	Maintains the master schedule for the company.
Microsoft® Office 2002 and 2007;	Used in conjunction with the publishing software to generate study reports.

Program/System	Description
Provantis Dispense™	Comprehensive system (Instem LSS Limited) to manage test materials, including receipt, formulation instructions, and accountability.
WIL Formulations Dispense System (WFDS)	In-house developed system for use in conjunction with Provantis Dispense™ to ensure proper storage and use of formulations.
WIL Metasys	In-house developed system used to record and report animal room environmental conditions.
WIL Motor Activity System (WMAS) and Kinder Scientific MotorMonitor System	WMAS is an in-house developed, computer-based system utilized to minimize error and allow for quality control during the collection of locomotor activity data using the Kinder Scientific MotorMonitor System (Kinder Scientific Company, LLC), and transfer of these data to WTDMSTM for reporting.
WIL Toxicology Data Management System™ (WTDMS™)	In-house developed system used for collection and reporting of in-life and *postmortem* data.

Note: Version numbers of WTDMS™ programs used for the study are presented on the report data tables (reporting programs); version numbers and release dates are otherwise maintained in the study records and/or facility records.

5.12.2. STATISTICAL ANALYSES

Each mean was presented with the standard deviation (S.D.), standard error (S.E.), and the number of animals (N) used to calculate the mean. Due to the use of significant figures and the different rounding conventions inherent in the types of software used, the means and standard deviations on the summary and individual tables may differ slightly. Therefore, the use of reported individual values to calculate subsequent parameters or means will, in some instances, yield minor variations from those listed in the report data tables. Data obtained from nongravid females were excluded from statistical analyses following the mating period. Where applicable, the litter was used as the experimental unit.

5.12.2.1. ANALYSES CONDUCTED BY WIL RESEARCH

All statistical tests were performed using WTDMS™ unless otherwise noted. Analyses were conducted using two-tailed tests (except as noted otherwise) for minimum significance levels of 1% and 5%; each test substance-treated group was compared to the vehicle control group (Group 2), the vehicle control group (Group 2) was compared to the sham control (Group 1), and the positive control group (Group 6) was compared to the sham control group (Group 1) by sex, with the following exception. The vehicle control group (Group 2) was compared to the sham control group (Group 1) and the positive control group (Group 6) was compared to the sham control group (Group 1) using a two-sample t-test (Snedecor and Cochran, 1980).

Parental mating, fertility, conception, and copulation indices were analyzed using the Chi-square test with Yates' correction factor (Hollander and Wolfe, 1999). Mean parental body weights (weekly, gestation, and lactation), body weight changes, and food consumption, offspring body weights and body weight changes, gestation length, numbers of former implantation sites, numbers of corpora lutea, number of pups born, live litter size on PND 0, unaccounted-for sites, absolute and relative organ weights, clinical pathology values (except for gamma glutamyltransferase), pre-coital intervals, and continuous FOB data values were subjected to a parametric one-way ANOVA (Snedecor and Cochran, 1980) to determine intergroup differences between the vehicle control and test substance-treated groups. If the ANOVA revealed significant ($p<0.05$) intergroup variance, Dunnett's test (Dunnett, 1964) was used to compare the test substance-treated groups to the control group. Histopathological findings in the test substance-treated groups and FOB parameters that yield scalar or descriptive data in the test substance-treated groups were compared to the vehicle control group using Fisher's Exact test (Steel and Torrie, 1980). Gamma glutamyltransferase values under range were assigned a value of 0.1 (half the lower limit of quantification) for statistical analysis and reporting. Gamma glutamyltransferase data, mean litter proportions (percent per litter) of males at birth, and postnatal survival were subjected to the Kruskal-Wallis nonparametric ANOVA (Kruskal and Wallis, 1952) to determine intergroup differences between the

vehicle control and test substance-treated groups. If the ANOVA revealed significant ($p<0.05$) intergroup variance, Dunn's test (Dunn, 1964) was used to compare the test substance-treated groups to the vehicle control group.

5.12.2.2. ANALYSES CONDUCTED BY BIOSTAT CONSULTANTS, INC.

All analyses were conducted using SAS version 9.1 (SAS Institute, Inc., 2002-2003), or higher, software. The statistical summary report is presented in Appendix L.

Ambulatory and total counts measured during locomotor activity assessments were analyzed by sex and session, with a RMANOVA. Factors in the model included treatment group (TRT), time interval (TIME) and the interaction of time interval and treatment group (TRT*TIME). The SAS® procedure PROC MIXED was used for analysis with the random effect of animal included as the repeated measurement. The covariance structure across time was selected by comparing Akaike's Information Criterion (AIC).

The monotonic dose-response relationship was evaluated using sequential linear trend tests based on ordinal spacing of dosage levels. The linear dose by time interaction (LinTrt*Time) was evaluated, and if significant at the 0.05 level, trend tests on treatment means were performed at the 0.05 level for each time interval. If the linear dose by time interaction was not significant, the trend test was conducted across the pooled time intervals by session only.

Nonmonotonic dose responses were evaluated whenever no significant linear trends were detected but TRT and/or TRT*TIME interaction was significant at the 0.01 level. Within the framework of the RMANOVA, pair-wise comparisons were made for each individual treated group with the control group through linear contrasts. If TRT*TIME was significant, the comparisons were conducted for each time interval. If only the TRT effect was significant, the comparisons were conducted across the pooled time intervals of the entire session. These nonmonotonic dose response comparisons were conducted at the 0.01 significance level.

5.12.2.3. STATISTICS CONDUCTED BY MIDWEST BIORESEARCH, LLC

The percentages of micronucleated cells in polychromatic erythrocytes (PCEs), micronucleated cells in normochromatic erythrocytes (NCEs) and in the ratio of PCEs to total erythrocytes for the test substance- and vehicle control-treated groups were compared using an analysis of variance (ANOVA) (Snedecor and Cochran, 1980). If the ANOVA revealed statistically significant ($p<0.05$) intergroup variance, Dunnett's test (Dunnett, 1964) was used to compare each test substance-treated group to the vehicle control group. In addition, the positive control and vehicle control groups and the sham and vehicle control groups were compared using separate parametric one-way analysis of variance (ANOVA) (Snedecor and Cochran, 1980). Statistical significance was assessed at a 95% confidence level ($p\leq0.05$).

6. RESULTS

The positive control group (Group 6) was the control group for the micronucleus assay and was not treated until 1 day prior to euthanasia.

6.1. ANALYSES OF DOSING FORMULATIONS

Analyses of Dosing Formulations Report: Appendix D

The analyzed dosing formulations met the applicable WIL Research SOP acceptance criteria for test substance homogeneity and, following 8 days of room temperature storage, resuspension homogeneity with the following exceptions. The initial homogeneity results obtained for 30 mg/mL and 90 mg/mL formulations prepared on 22 September 2010 did not meet the WIL Research SOP acceptance criteria, *i.e.*, the relative standard deviation (RSD) for the mean concentration was $\leq$10% at a concentration within the acceptable limits (85% to 115% of target concentration). The back-up samples were analyzed from these same dosing formulations and met the previously mentioned criteria for homogeneity. Concentration analyses of formulations used for dose administration were within WIL Research's SOP range for suspensions (85% to 115%). The test substance was not detected in the vehicle formulation that was administered to the control group (Group 1).

Text Table 1. Results of Homogeneity Analyses

	Group 3 (10 mg/mL)	Group 4 (30 mg/mL)	Group 5 (90 mg/mL)
Homogeneity Assessment of the 22 September 2010 Formulations			
Mean Concentration (mg/mL)	10.9	35.6	116
RSD (%)	5.1	11	5.5
Mean % of Target	109	119	129
Homogeneity Assessment of the 22 September 2010 Formulations Back-up Samples			
Mean Concentration (mg/mL)	NA	25.6	77.3
RSD (%)	NA	10	8.8
Mean % of Target	NA	85.2	85.9
8-Day Room Temperature Resuspension Homogeneity Assessment of the 22 September 2010 Formulations			
Mean Concentration (mg/mL)	9.99	29.7	90.7
RSD (%)	3.4	1.6	3.3
Mean % of Target	99.9	99.1	101

NA = Not Applicable.

Text Table 2. Results of Concentration Analyses

	Mean Concentration, mg/mL (% of Target)		
Date of Preparation	Group 3 (10 mg/mL)	Group 4 (30 mg/mL)	Group 5 (90 mg/mL)
29 September 2010	9.91 (99.1)	30.6 (102)	90.7 (101)
6 October 2010	9.40 (94.0)	29.1 (97.1)	84.5 (93.9)
13 October 2010	9.18 (91.8)	28.5 (95.1)	85.3 (94.8)
20 October 2010	10.5 (105)	33.3 (111)	93.2 (104)
27 October 2010	10.8 (108)	30.1 (100)	101 (112)
3 November 2010	9.78 (97.8)	30.2 (101)	90.1 (100)
10 November 2010	---	29.3 (97.6)	76.5 (85.0)

"---" = Formulation not prepared or analyzed

6.2. F_0 GENERATION

6.2.1. CLINICAL OBSERVATIONS AND SURVIVAL

Summary Data: Table S1, Table S2, Table S3, Table S4

Individual Data: Table A1, Table A2, Table A3, Table A4, Table A5, Table A6

In the 900 mg/kg/day group, a single female (no. 81964) was euthanized *in extremis* on lactation day 2 due to poor clinical condition. On the day of euthanasia, this female had clinical findings of body cool to the touch, rales, slightly drooping eyelids, hunched posture, yellow or brown material on the ventral abdominal, anogenital, and urogenital areas, and red material around the nose noted at the detailed physical examination. Upon macroscopic and microscopic examination, the cause of moribund condition for this female was determined to be acute inflammation in the uterus (see Section 6.2.9.1. and Section 6.2.9.3.) and, therefore, was not attributed to test substance administration. One female (no. 81951) in the 900 mg/kg/day group was euthanized on lactation day 2 due to total litter loss. All other males and females at all dosage levels survived to the scheduled necropsy.

Test substance-related clinical findings observed in the surviving animals in the 900 mg/kg/day group generally consisted of hunched posture, rocking, lurching, and/or swaying while ambulating, walking on tiptoes, hypoactivity, and shallow respiration for the majority of females. In addition, slight tremors were observed for female no. 81918 on study day 1 and rales were noted for female no. 81969 on gestation day 2. In contrast, only hunched posture was observed for half of the surviving males in the 900 mg/kg/day group. The above-mentioned clinical findings observed in the 900 mg/kg/day group were noted approximately 1 hour following dose administration and were generally noted primarily intermittently during the first 2 weeks of treatment. Although these findings did not persist to the detailed physical examinations, due to the frequency and nature of these findings, they were considered adverse. In addition, yellow material on the ventral abdominal, ventral thoracic, anogenital and/or urogenital areas and red material around the mouth was observed for the majority of males and females in the 900 mg/kg/day

group at the detailed physical examinations and/or approximately 1 hour following dose administration and was attributed to test substance administration. At the detailed physical examinations, test substance-related higher incidences of hair loss on the left hindlimb, ventral abdominal, and ventral thoracic areas were observed for females in the 900 mg/kg/day group while hair loss on the ventral abdominal and urogenital areas was observed for the majority of males in this group. These clinical findings were noted as early as study day 7 and generally continued throughout the study. Hair loss is not considered to be toxicologically relevant and therefore the hair loss noted in the 900 mg/kg/day group was not considered to be adverse.

Salivation was noted prior to dosing for the majority of males and females in the 300 and 900 mg/kg/day groups generally throughout the treatment period. In addition, clinical findings of clear material around the nose, mouth, and/or on the forelimbs were noted in a dose-related manner for males and females in the 100, 300, and 900 mg/kg/day groups at the detailed physical examinations, at the time of dosing, and/or approximately 1 hour following throughout the study. All of the above-mentioned salivation-related findings noted in the test substance-treated groups were attributed to test substance administration, but were not considered to be adverse.

Other findings noted in the test substance-treated groups occurred infrequently, at similar frequencies in the vehicle control group, and/or in a manner that was not dose-related.

6.2.2. BODY WEIGHTS

6.2.2.1. MALES

Summary Data: Table S5, Table S6; Figure 1
Individual Data: Table A7, Table A8

A test substance-related, significantly ($p<0.01$) lower mean body weight gain compared to the vehicle control group was noted in the 900 mg/kg/day group during the first week of treatment (study days 0-7). Slightly lower (not statistically significant) mean body weight gains were generally noted in this group compared to the vehicle control group

during study days 7-27. As a result, significantly ($p<0.01$) lower mean body weight gains were observed in the 900 mg/kg/day group compared to the vehicle control group when the pre-mating treatment period (study days 0-13) and entire treatment period (study days 0-27) were evaluated. Mean body weights in this group were 6.0% to 8.2% lower than the vehicle control group during study days 7-27; the differences were not statistically significant.

Mean body weights and body weight gains in the 100 and 300 mg/kg/day groups were generally similar to the vehicle control group during the pre-mating (study days 0-13) and overall treatment (study days 0-27) periods. The only statistically significant difference from the vehicle control group was a lower ($p<0.05$) mean body weight gain in the 300 mg/kg/day group during study days 13-20 when compared to the vehicle control group. However, there were no effects on absolute mean body weights in this group and the difference did not occur in a dose-related manner. Therefore, the transient body weight deficit observed in the 300 mg/kg/day group during study days 13-20 was not attributed to test substance administration.

Mean body weights and body weight gains in the vehicle control group were similar to the sham control group throughout the pre-mating (study days 0-13) and entire treatment (study days 0-27) periods. Differences from the sham control group were slight and not statistically significant with the exception of a significantly ($p<0.01$) higher mean body weight gain in the vehicle control group during study days 13-20.

Mean body weights and body weight gains in the positive control group was similar to the sham control group which was expected since neither of these groups was treated during this time. Differences from the sham control group were slight and attributed to biological variability.

6.2.2.2. FEMALES

6.2.2.2.1. PRE-MATING

Summary Data: Table S7, Table S8; Figure 2

Individual Data: Table A9, Table A10

Mean body weights and body weight gains in the 100, 300, and 900 mg/kg/day groups were unaffected by test substance administration. Slightly lower mean body weight gains or mean body weight losses were noted in the 100, 300, and 900 mg/kg/day groups during study days 0-7. However, these deficits were transient, the differences were not statistically significant compared to the vehicle control group, there were no effects on mean body weights, and no dose-related trend was observed; therefore, these differences were not attributed to test substance administration.

Mean body weights and body weight gains in the vehicle control group were similar to the sham control group throughout the pre-mating period (study days 0-13). Differences from the sham control group were slight and not statistically significant.

Mean body weights and body weight gains in the positive control group was similar to the sham control group which was expected since neither of these groups was treated during this time. Differences from the sham control group were slight and attributed to biological variability.

6.2.2.2.2. GESTATION

Summary Data: Table S9, Table S10; Figure 3

Individual Data: Table A11, Table A12

A higher mean body weight gain was noted in the 900 mg/kg/day group during gestation days 0-4. Although this difference was significantly ($p<0.05$) different from the vehicle control group, the body weight gain observed in the 900 mg/kg/day group was similar to that observed in the sham control group and was therefore not attributed to test substance administration. Mean body weight gains in this group were similar to the vehicle control group during gestation days 4-14. However, test substance-related lower mean body

weight gains were noted in this group during gestation days 14-17 and 17-20; differences were significant ($p<0.01$) when compared to the vehicle control group. Consequently, when the overall gestation treatment period (gestation days 0-20) was evaluated, a slightly lower (not statistically significant) mean body weight gain was noted in the 900 mg/kg/day group compared to the vehicle control group. Mean body weights in the 900 mg/kg/day group were 8.4% lower (not statistically significant) than the vehicle control group on gestation day 20.

Mean body weights and body weight gains in the 100 and 300 mg/kg/day groups were generally similar to those in the vehicle control group throughout gestation. None of the differences from the vehicle control group were statistically significant.

Mean body weights and body weight gains in the vehicle control group were generally similar to those in the sham control group throughout gestation, with the following exceptions. A lower mean body weight gain was noted in the vehicle control group during gestation days 0-4. This body weight deficit was significant ($p<0.05$) when compared to the sham control group and resulted in a significantly ($p<0.05$) lower mean body weight gain in this group when the overall gestation period (days 0-20) was evaluated. Consequently, mean body weight in the vehicle control group on gestation day 20 was 6.4% lower (not statistically significant) than the sham control group.

Mean body weights and body weight gains in the positive control group were similar to the sham control group, with the following exception. Lower mean body weight gains were observed in the positive control group during gestation days 4-7 and 14-17 which resulted in a lower mean body weight gain when the overall gestation period (days 0-20) was evaluated and a mean body weight on gestation day 20 that was 9.8% lower than the sham control group. Although these differences were occasionally significant ($p<0.05$), these body weight effects occurred prior to treatment and were therefore attributed to biological variability.

6.2.2.2.3. LACTATION

Summary Data: Table S11, Table S12

Individual Data: Table A13, Table A14

Mean body weight gain in the 900 mg/kg/day group was similar to the vehicle control group during lactation; however, mean body weights in this group were 7.6% and 7.7% lower than the vehicle control group on lactation days 1 and 4, respectively, due to the decrements in mean body weight gain observed in this group during the last week of gestation.

No test substance-related effects on mean body weights and body weight gains were noted in the 100 and 300 mg/kg/day groups during lactation. None of the differences from the vehicle control group were statistically significant. A lower (not statistically significant) mean body weight gain was observed in the 300 mg/kg/day group during lactation days 1-4 compared to the vehicle control group. However, in the absence of a dose response, this difference was not attributed to test substance administration.

Mean body weights and body weight gains in the vehicle control group were similar to the sham control group during lactation; differences were slight and not statistically significant.

A lower mean body weight gain and lower mean body weights were noted in the positive control group compared to the sham control group during lactation; the differences were not statistically significant. The body weight decrements observed in the positive control group were most likely due to treatment with cyclophosphamide on lactation day 3.

6.2.3. FOOD CONSUMPTION

6.2.3.1. MALES

Summary Data: Table S13, Table S14

Individual Data: Table A15, Table A16

Test substance-related lower mean food consumption, evaluated as g/animal/day and g/kg/day, was noted in the 900 mg/kg/day group when compared to the vehicle control group throughout the pre-mating treatment period (study days 0-13) and corresponded to a lower mean body weight gain in this group during the same period. The differences were significant ($p<0.01$) when compared to the vehicle control group.

Mean food consumption in the 100 and 300 mg/kg/day group males was similar to that in the vehicle control group during study days 0-7. However, significantly ($p<0.05$ or $p<0.01$) lower mean food consumption was noted in these groups during study days 7-13 when compared to the vehicle control group. Although the deficits noted in the 100 and 300 mg/kg/day groups were attributed to test substance administration, in the absence of corresponding effects on mean body weights or body weight gains, these deficits were not considered to be adverse.

Significantly ($p<0.01$) lower mean food consumption was noted in the vehicle control group compared to the sham control group throughout the pre-mating treatment period (study days 0-13). It is not uncommon for rats to show reduced food consumption when treated with corn oil, which has a high caloric content. Since mean food consumption was similar in these 2 groups during the pre-treatment period (study days -7-0) and there were no corresponding effects on mean body weight gain noted in this group during the pre-mating treatment period, the decrements in mean food consumption observed in the vehicle control group were attributed to the high caloric content of the vehicle.

Mean food consumption in the positive control group was similar to the sham control group during study days 0-7 and significantly ($p<0.01$) lower than the sham control group

during study days 7-13. The reduction in the positive control group occurred prior to treatment and was therefore attributed to biological variability.

6.2.3.2. FEMALES

6.2.3.2.1. PRE-MATING

Summary Data: Table S15, Table S16

Individual Data: Table A17, Table A18

Test substance-related lower mean food consumption, evaluated as g/animal/day and g/kg/day, was noted in the 100, 300, and 900 mg/kg/day groups throughout the pre-mating period (study days 0-13); the differences were generally significant ($p<0.01$) compared to the vehicle control group. In the absence of corresponding effects on mean body weights in these groups, the reduced food consumption noted in the 100, 300, and 900 mg/kg/day groups was not considered to be adverse.

Significantly ($p<0.01$) lower mean food consumption was noted in the vehicle control group compared to the sham control group throughout the pre-mating treatment period (study days 0-13). Mean food consumption in the vehicle control group was similar to the sham control group during the pre-treatment period (study days -7-0) and there were no corresponding effects on mean body weight gain noted in this group during the pre-mating treatment period, therefore, the decrements in mean food consumption observed in the vehicle control group were attributed to the high caloric content of the vehicle.

Mean food consumption in the positive control group was similar to the sham control group during study days 0-7 and significantly ($p<0.01$) lower than the sham control group during study days 7-13. As this reduction in mean food consumption occurred prior to treatment, it was attributed to biological variability.

6.2.3.2.2. GESTATION

Summary Data: Table S17, Table S18

Individual Data: Table A19, Table A20

No test substance-related effects on mean maternal food consumption were observed at any dosage level. A significant ($p<0.01$) increase in mean food consumption, evaluated as g/animal/day, compared to the vehicle control group was noted in the 900 mg/kg/day group during gestation days 4-7. The only other significant ($p<0.05$ or $p<0.01$) differences from the vehicle control group were increased food consumption, evaluated as g/kg/day, in the 900 mg/kg/day group during gestation days 4-14 and when the overall gestation period (gestation days 0-20) was evaluated. In the absence of a correlating increase in body weight gain, the higher g/kg/day food consumption values were attributed to biological variability.

Significantly ($p<0.01$) lower mean food consumption was noted in the vehicle control group compared to the sham control group throughout gestation (days 0-20). Since mean food consumption in the vehicle control group was similar to the sham control group during the pre-treatment period (study days -7-0), the decrements in this group were attributed to the high caloric content of the vehicle.

Mean food consumption in the positive control group was similar to the sham control group during gestation which was consistent with the fact that neither group received treatment at this time.

6.2.3.2.3. LACTATION

Summary Data: Table S19, Table S20

Individual Data: Table A21, Table A22

Test substance-related lower mean food consumption, evaluated as g/animal/day and g/kg/day, was observed in the 900 mg/kg/day during lactation days 1-4; the difference was not statistically significant when compared to the vehicle control group. In the

absence of an effect on mean body weight gain in this group during lactation, the reduced food consumption was not considered to be adverse.

Mean food consumption in the 100 and 300 mg/kg/day groups was unaffected by the test substance during lactation. None of the differences from the vehicle control group were statistically significant.

Mean food consumption in the vehicle control group was similar to the sham control group during lactation. Differences from the sham control group were slight and not statistically significant.

Slightly lower mean food consumption, corresponding to a lower mean body weight gain, was noted in the positive control group during lactation. Differences from the sham control group were slight, and not statistically significant. However, the reduced food consumption noted in the positive control group was likely due to cyclophosphamide treatment on lactation day 3.

6.2.4. FUNCTIONAL OBSERVATIONAL BATTERY (FOB)

6.2.4.1. HOME CAGE OBSERVATIONS

Summary Data: Table S21, Table S22, Table S23, Table S24

Individual Data: Table A23, Table A24, Table A25, Table A26, Table A27, Table A28, Table A29

Positive Control Data: Appendix G

Historical Control Data: Appendix M

Home cage parameters were unaffected by test substance administration. There were no statistically significant differences for the test substance-treated groups when compared to the vehicle control group during study week 4 (males) or on lactation day 4 (females).

6.2.4.2. HANDLING OBSERVATIONS

Summary Data: Table S25, Table S26, Table S27, Table S28

Individual Data: Table A30, Table A31, Table A32, Table A33, Table A34, Table A35, Table A36

Positive Control Data: Appendix G

Historical Control Data: Appendix M

Handling parameters were unaffected by test substance administration. There were no statistically significant differences for the test substance-treated groups when compared to the vehicle control group during study week 4 (males) or on lactation day 4 (females).

6.2.4.3. OPEN FIELD OBSERVATIONS

Summary Data: Table S29, Table S30, Table S31, Table S32

Individual Data: Table A37, Table A38, Table A39, Table A40, Table A41, Table A42, Table A43

Positive Control Data: Appendix G

Historical Control Data: Appendix M

Open field parameters were unaffected by test substance administration. There were no statistically significant differences for the test substance-treated groups when compared to the vehicle control group during study week 4 (males) or on lactation day 4 (females) and/or were similar to pretest values.

6.2.4.4. SENSORY OBSERVATIONS

Summary Data: Table S33, Table S34, Table S35, Table S36

Individual Data: Table A44, Table A45, Table A46, Table A47, Table A48, Table A49, Table A50

Positive Control Data: Appendix G

Historical Control Data: Appendix M

Sensory parameters were unaffected by test substance administration. There were no statistically significant differences for the test substance-treated groups when compared to the vehicle control group during study week 4 (males) or on lactation day 4 (females).

6.2.4.5. NEUROMUSCULAR OBSERVATIONS

Summary Data: Table S37, Table S38, Table S39, Table S40; Figure 4, Figure 5, Figure 6, Figure 7

Individual Data: Table A51, Table A52, Table A53, Table A54, Table A55, Table A56, Table A57

Positive Control Data: Appendix G

Historical Control Data: Appendix M

Neuromuscular parameters were unaffected by test substance administration. There were no statistically significant differences for the test substance-treated groups when compared to the vehicle control group during study week 4 (males) or on lactation day 4 (females).

6.2.4.6. PHYSIOLOGICAL OBSERVATIONS

Summary Data: Table S41, Table S42, Table S43, Table S44

Individual Data: Table A58, Table A59, Table A60, Table A61, Table A62, Table A63, Table A64

Positive Control Data: Appendix G

Historical Control Data: Appendix M

A test substance-related, significantly ($p<0.05$) lower mean body weight was noted in the 900 mg/kg/day group males compared to the vehicle control group during study week 4, corresponding to the lower mean body weight gains noted in this group during study days 0-27. In the 900 mg/kg/day group females, a test substance-related lower (not statistically significant) mean body weight, which corresponded to lower mean body weight gains observed during the later part of gestation, was noted compared to the vehicle control group on lactation day 4. Mean body weights in the 100 and 300 mg/kg/day group males and females were unaffected by test substance administration. Other physiological parameters (catalepsy and body temperature) were unaffected by test substance administration at all dosage levels. A significant ($p<0.05$) increase in body temperature was noted in the 300 mg/kg/day group females on lactation day 4. In the absence of an effect on body temperature in the 900 mg/kg/day group, this difference was not attributed to test substance administration. There were no other statistically significant differences for the test substance-treated groups when compared to the vehicle control group during study week 4 (males) or on lactation day 4 (females).

6.2.5. LOCOMOTOR ACTIVITY

Summary Data: Table S45, Table S46; Figure 8, Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, Figure 14, Figure 15, Figure 16, Figure 17, Figure 18, Figure 19

Individual Data: Table A65, Table A66, Table A67, Table A68, Table A69, Table A70

Positive Control Data: Appendix G

Statistical Analysis Summary: Appendix L

Historical Control Data: Appendix N

Locomotor activity patterns (total activity as well as ambulatory activity counts) in F_0 animals were unaffected by test substance administration at all concentrations when evaluated during week 4 (males) and on lactation day 4 (females). Values obtained from the 6 subintervals evaluated (0-10, 11-20, 21-30, 31-40, 41-50, and 51-60 minutes) and the overall 60-minute test session values were comparable to the concurrent vehicle control values. Differences from the vehicle control group were slight and not statistically significant when analyzed by a repeated measures analysis. No remarkable shifts in the pattern of habituation occurred in any of the Naphthenic acid-treated groups when the F_0 animals were evaluated during study week 4 (males) or on lactation day 4 (females).

6.2.6. CLINICAL PATHOLOGY

6.2.6.1. HEMATOLOGY

Summary Data: Table S47, Table S48

Individual Data: Table A71, Table A72, Table A73, Table A74, Table A75

Pathology Report: Appendix I

The following alterations in hematology parameters were considered to be related to test substance administration in the 900 mg/kg/day group males: red blood cell count (↓4.8%), hemoglobin concentration (↓6.4%), hematocrit (↓6.4%), platelet count (↑14.3%), large unstained cell count (↑100.0%), and red cell distribution width (↑9.6%);

the differences were significant ($p<0.05$ or $p<0.01$) when compared to the vehicle control group. The hemoglobin distribution width was significantly ($p<0.05$) higher in the 300 and 900 mg/kg/day group males (↑7.0%, ↑7.4%, respectively). All changes were of small magnitude and were within the WIL historical control reference range.

The following alterations in hematology parameters were considered to be related to test substance administration in the 300 and 900 mg/kg/day group females: absolute white blood cell count (↑49.1%, ↑47.4%, respectively) and absolute lymphocyte count (↑53.9%, ↑49.4%, respectively). Although significantly ($p<0.05$) higher when compared to the vehicle control group, these values were within the WIL historical control reference range. A significantly ($p<0.05$) higher absolute monocyte count (↑218.2%) was also observed in the 900 mg/kg group females.

There were no other test substance-related effects on hematology parameters and no test substance-related effects on coagulation parameters. However, some statistically significant ($p<0.05$ or $p<0.01$) differences were observed when the vehicle control and test substance-treated groups were compared. These findings included: lower activated partial thromboplastin time (APTT) in the 900 mg/kg group females that is a change in a direction of no known toxicologic importance. Higher mean platelet volume (MPV) and higher large unstained cell (LUC) count in the 300 mg/kg group females lacked a clear dose-related response.

Statistically significant findings that involved percentage reticulocyte or leukocyte differential counts were not itemized above, and were not considered toxicologically important because absolute cell counts are more relevant for interpretative purposes.

6.2.6.2. SERUM CHEMISTRY

Summary Data: Table S49, Table S50, Table S51, Table S52

Individual Data: Table A76, Table A77, Table A78, Table A79, Table A80, Table A81, Table A82, Table A83, Table A84, Table A85

Pathology Report: Appendix I

The following alterations in serum chemistry parameters were considered to be related to test substance administration in the 900 mg/kg/day group males: mean serum creatinine (↑33.3%) and mean serum chloride (↓1.9%); these differences were significant ($p<0.01$) when compared to the vehicle control group. The change in serum chloride was of small magnitude, and the value fell within the WIL historical control reference range.

The following alterations in serum chemistry parameters were considered to be related to test substance administration in the 900 mg/kg/day group females: mean serum albumin (↑9.3%), total protein (↑6.3%), mean serum glucose (↑13%), mean serum cholesterol (↑29%), and mean serum calcium (↑8.5%); these differences were significant ($p<0.05$ or $p<0.01$) when compared to the vehicle control group. Mean serum phosphorus was significantly ($p<0.05$) higher in the 300 and 900 mg/kg/day group females (↑38.5%, ↑41%, respectively). The changes observed in the serum chemistry values in the 300 and 900 mg/kg/day group females were all of small magnitude, and the values were within the WIL historical control reference range.

There were no other test substance-related effects on serum chemistry parameters. However, some other statistically significant ($p<0.05$ or $p<0.01$) differences were observed when the vehicle control and test substance-treated groups were compared. These findings included: higher mean serum potassium in the 300 mg/kg/day group females. This finding lacked a clear dose-related response.

6.2.7. REPRODUCTIVE PERFORMANCE

Summary Data: Table S53

Individual Data: Table A86

Historical Control Data: Appendix O

F_0 male and female reproductive parameters are presented in the following table.

Text Table 3. Results of F_0 Reproductive Performance

	Dosage Level (mg/kg/day)						
Parameter	Sham control	0	100	300	900	60	WIL HC[a] Mean (Range)
Male Mating Index	100.0	100.0	100.0	83.3	100.0	100.0	96.8 (84.0-100.0)
Female Mating Index	100.0	100.0	100.0	83.3	100.0	100.0	98.2 (86.7-100.0)
Male Fertility Index	100.0	75.0	100.0	83.3	100.0	100.0	91.1 (60.0-100.0)
Female Fertility Index	100.0	75.0	100.0	83.3	100.0	100.0	93.2 (60.0-100.0)
Male Copulation Index	100.0	75.0	100.0	100.0	100.0	100.0	94.4 (71.4-100.0)
Female Conception Index	100.0	75.0	100.0	100.0	100.0	100.0	95.0 (65.2-100.0)
Pre-Coital Interval (days)	2.8	1.4[b]	2.3	4.2[c]	3.8	2.0	2.9 (1.8-4.8)

[a] = WIL historical control data
[b] = Statistically significant at 0.01 compared to the sham control group (Group 1).
[c] = Statistically significant at 0.05 compared to the vehicle control group (Group 2).

No test substance-related effects on reproductive performance were observed at any dosage level. A significantly ($p<0.05$) greater number of days between pairing and coitus was noted in the 300 mg/kg/day group compared to the vehicle control group. This difference was attributed to a single female (no. 81914) in this group with a pre-coital interval of 13 days and in the absence of a dose response, this increase was not attributed to test substance administration. No other statistically significant differences were noted between the vehicle control and test substance-treated groups. Males that did not sire a litter numbered 3 and 2 in the vehicle control and 300 mg/kg/day groups, respectively. Females that had evidence of mating but did not deliver numbered 3 in the vehicle control group.

A significant ($p<0.01$) decrease in the mean number of days between pairing and coitus was noted in the vehicle control group (1.4 days) when compared to the sham control group (2.8 days). This value was below the minimum mean value in the WIL historical control data (1.8 days) and was attributed to biological variability.

The mean number of days between pairing and coitus in the positive control group was similar to the sham control group value and was consistent with the lack of treatment in either group during this time period.

6.2.8. GESTATION LENGTH AND PARTURITION

Summary Data: Table S54, Table S55

Individual Data: Table A87, Table A88

Historical Control Data: Appendix O

Mean gestation lengths were similar amongst all groups when the 100, 300, and 900 mg/kg/day groups were compared to the vehicle control group or when the vehicle control group was compared to the sham control group. No statistically significant differences were noted. No signs of dystocia were noted in any group.

As expected, mean gestation length in the positive control group was similar to the sham control group; consistent with the lack of treatment in this group during this time.

6.2.9. ANATOMIC PATHOLOGY

6.2.9.1. MACROSCOPIC EXAMINATIONS

Summary Data: Table S56, Table S57, Table S58, Table S59, Table S60, Table S61

Individual Data: Table A89, Table A90, Table A91, Table A92, Table A93, Table A94

Pathology Report: Appendix I

Historical Control Data: Appendix O

Female no. 81964 in the 900 mg/kg/day group was euthanized *in extremis* on lactation day 2. Gross observations for this female included irregular white areas on all lobes of the liver, pale brain, pale pituitary, pale adrenal glands, distended stomach, and small thymus. The cause of moribund condition for this female was attributed to the acute inflammation in the uterus and therefore not attributed to test substance administration.

At the scheduled F_0 male and female necropsies, a test substance-related increased incidence of pale kidneys was noted in the 900 mg/kg/day group males. All other

macroscopic findings noted in the test substance-treated groups occurred infrequently, at similar frequencies in the vehicle control group, and/or in a manner that was not dose-related.

A reduction in the mean number of corpora lutea was noted in the 900 mg/kg/day group (13.8 per dam) when compared to the vehicle control group (15.6 per dam); this value was equal to the minimum mean value in the WIL historical control data. As a result, a reduction in the mean number of former implantation sites was observed in this group (12.2 per dam) compared to the vehicle control group (15.0 per dam) and the minimum mean value (13.0 per dam) in the WIL historical control data. Although these values were not statistically significantly different from the vehicle control group, the magnitude of the difference between the mean number of implantation sites and the number of corpora lutea produced in this group was greater than that observed in the vehicle control group; therefore, these differences were attributed to test substance administration. A corresponding test substance-related significant ($p<0.01$) reduction in the mean number of pups born (10.8 per dam) was also noted in the 900 mg/kg/day group relative to the vehicle control group (14.1 per dam); this value was also below the minimum mean value (11.7 per dam) in the WIL historical control data. The mean number of unaccounted-for sites in this group (1.4 per dam) was slightly higher than the vehicle control group (0.9 per dam); this value was not statistically significant when compared to the vehicle control group, was equal to the maximum mean value in the WIL historical control data, and therefore was not attributed to test substance administration.

A slight reduction in the mean number of former implantation sites (13.0 per dam) and as a result, the mean number of pups born (12.0 per dam) were noted in the 300 mg/kg/day group. Although the differences were not statistically different when compared to the vehicle control group, they were attributed to test substance administration. The mean number of unaccounted-for sites and corpora lutea in this group were similar to the vehicle control group.

The mean numbers of unaccounted-for sites, implantation sites, corpora lutea, and pups born in the 100 mg/kg/day group were similar to the vehicle control group. The differences were slight and not statistically significant.

A slightly lower mean number of corpora lutea (15.6 per dam) was noted in the vehicle control group when compared to the sham control group (17.6 per dam). This difference was not statistically significant and the value was within the WIL historical control data range (13.8 to 18.8 per dam). The mean numbers of unaccounted-for sites, implantation sites, and pups born in the vehicle control group were similar to the sham control group.

A significant ($p<0.05$) reduction in the mean number of corpora lutea was noted in the positive control group (13.6 per dam) when compared to the sham control group (17.8 per dam). Although the mean number of former implantation sites (12.8 per dam) observed in the positive control group was also significantly ($p<0.01$) lower than the sham control group (15.8 per dam), the difference in the number of successful implantations relative to the number of corpora lutea produced was less than that observed in the sham control group. Furthermore, the mean number of unaccounted-for sites in the positive control group was less than that observed in the sham control group. Therefore, the differences in the numbers of corpora lutea, implantation sites, and pups born in the positive control group were attributed to the small sample size in these groups resulting in biological variability.

6.2.9.2. ORGAN WEIGHTS

Summary Data: Table S62, Table S63

Individual Data: Table A95, Table A96, Table A97, Table A98, Table A99, Table A100, Table A101, Table A102, Table A103

Pathology Report: Appendix I

Organ weight differences presented in Text Table 4 were considered to be associated with administration of the test substance.

Text Table 4. Toxicologically Relevant Organ Weight Changes

Parameter	Direction and magnitude of change	Dosage level (mg/kg/day)	Sex	Interval
Thyroids/Parathyroids				
Relative to body weight	↑25%**	900	M	PN
Relative to brain weight	↑11.3%*	900	M	PN
Liver				
Absolute	↑16.6%*, ↑48.1%**	300, 900	M	PN
	↑52.6%**	900	F	PN
Relative to body weight	↑20.9%**, ↑63.5%**	300, 900	M	PN
	↑21.8%**,↑65%**	300, 900	F	PN
Relative to brain weight	↑15.2%*, ↑50.8%**	300, 900	M	PN
	↑53.1%**	900	F	PN
Kidneys				
Absolute	↑17.4%**	900	M	PN
Relative to body weight	↑13.1**, ↑28.3%**	300, 900	M	PN
	↑13.4%**	900	F	PN
Relative to brain weight	↑19.3%**	900	M	PN

* = Significantly different from the vehicle control group at 0.05 using Dunnett's test
** = Significantly different from the vehicle control group at 0.01 using Dunnett's test

There were no other test substance-related effects on organ weights.

Significantly ($p<0.05$ or $p<0.01$) lower mean lung (absolute) weights were noted in the 100, 300, and 900 mg/kg/day group females compared to the vehicle control group. In addition, the lung weight relative to brain weight was lower in the 900 mg/kg/day group females. These values fell within the WIL historical control database range and were not associated with any gross, microscopic, or clinical pathology changes, and therefore, were not considered test substance related.

Lower mean uterus/vagina weights (absolute and relative to brain) were noted in the 100, 300, and 900 mg/kg/day group females; the differences were significant ($p<0.05$ or $p<0.01$) when compared to the vehicle control group. All gravid females were in lactational anestrus and undergoing involution. The values fell within the WIL historical

control database range and were not associated with any gross, histopathologic, or clinical pathology changes and were not considered test substance related.

Significantly ($p<0.01$) higher mean adrenal gland weights relative to body and/or brain weights and significantly ($p<0.05$ or $p<0.01$) lower mean spleen weights (absolute and relative) were observed in the cyclophosphamide positive control group males and females compared to the sham control group. In addition, lower mean thymus weights (absolute and relative) were noted in the positive control group males and lower mean kidney and liver weights (absolute and/or relative) and a higher mean brain weight (relative to body weight) were noted in the positive control group females; the differences were significant ($p<0.05$ or $p<0.01$) compared to the sham control group. The differences in mean organ weights observed in the positive control group were expected effects based on the known pharmacology of cyclophosphamide.

6.2.9.3. MICROSCOPIC EXAMINATIONS

Summary Data: Table S64, Table S65, Table S66, Table S67, Table S68
Individual Data: Table A89, Table A90, Table A91, Table A92, Table A93
Pathology Report: Appendix I

Female no. 81964 from the 900 mg/kg/day group was euthanized *in extremis* on lactation day 2. Histologic findings for this female included acute inflammation in the uterus, hypocellular bone marrow in the femur and sternum, contracted spleen, severe thymic lymphoid depletion, centrilobular hepatocellular hypertrophy, centrilobular to coalescing hepatocellular vacuolation, coagulation necrosis of the liver, moderate widespread tubular dilatation in the kidneys, and erosions of the glandular stomach with scattered neutrophilic infiltrate. In the kidneys, dilated tubules were observed throughout the cortex and outer medulla. Tubules were lined by attenuated epithelium and contained lightly eosinophilic granular material. The microscopic findings of thymic lymphoid depletion and centrilobular hepatocellular hypertrophy were consistent with observations made at the primary necropsy. The cause of the moribund condition for this female was the acute inflammation in the uterus.

Test substance-related findings occurred in all test substance-treated groups. Unique to the male rats were prominent hyaline droplets in the 100, 300, and 900 mg/kg/day groups and hyaline droplet nephropathy in the 300 and 900 mg/kg/day groups. Cortical lymphoid depletion was observed in the thymus of the 100 and 900 mg/kg/day group females, but was not observed in the 300 mg/kg/day group females. Epithelial hypertrophy and cytoplasmic vacuolation of the thyroid gland was observed in all test substance-treated groups. Centrilobular hepatocellular hypertrophy was observed in the 900 mg/kg/day group males and females. Cytoplasmic vacuolation of the zona fasciculata occurred in the adrenal cortex of the 900 mg/kg/day group females and the 100, 300, and 900 mg/kg/day group males.

Text Table 5. Incidence of Selected Histopathologic Findings, Scheduled Necropsy

Dosage (mg/kg/day):	Males				Females			
	0 Vehicle	100	300	900	0 Vehicle	100	300	900
Kidney [a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Droplet, hyaline	0	3	10^{++}	11^{++}	0	0	0	0
Minimal	-	3	9^{++}	9^{++}	-	-	-	-
Mild	-	0	1	2	-	-	-	-
Nephropathy, hyaline Droplet	0	0	2	9^{++}	0	0	0	0
Minimal	-	-	2	5^{+}	-	-	-	-
Mild	-	-	0	4	-	-	-	-
Thyroids [a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Hypertrophy, epithelial	0	6^{+}	9^{++}	11^{++}	0	3	4	8^{++}
Minimal	-	6^{+}	9^{++}	11^{++}	-	3	4	6^{+}
Mild	-	0	0	0	-	0	0	2
Vacuolation, cytoplasmic	0	6^{+}	9^{++}	10^{++}	0	3	4	8^{++}
Minimal	-	6^{+}	9^{++}	10^{++}	-	3	4	8^{++}
Liver [a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Hypertrophy, hepatocellular, centrilobular	0	0	0	8^{++}	0	0	0	10^{++}
Minimal	-	-	-	8^{++}	-	-	-	10^{++}
Vacuolation, hepatocellular, periportal	2	1	2	0	0	1	0	2
Minimal	1	1	2	-	-	1	-	2
Mild	1	0	0	-	-	0	-	0
Adrenal Cortex [a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Vacuolation, cytoplasmic	0	2	3	2	0	0	0	2
Minimal	-	2	3	2	-	-	-	1
Mild	-	-	-	0	-	-	-	1
Thymus [a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Depletion, lymphoid, cortex	0	0	0	0	0	1	0	5^{+}
Minimal	-	-	-	-	-	1	-	4
Mild	-	-	-	-	-	0	-	1

[a] - Number of tissues examined from each group.
$^{+}$ = Significantly different from vehicle control group at 0.05 using Fisher's Exact test.
$^{++}$ = Significantly different from vehicle control group at 0.01 using Fisher's Exact test.

Findings of uncertain relationship to the test substance included mineralization of the tubules in the kidneys and mild coagulative necrosis in the liver. In test substance-treated females, tubules in the inner stripe of the outer medulla were mineralized more often than in the vehicle control group rats (5 of 12 females in the control group, 6 of 12 females in the 100 mg/kg/day group, 9 of 12 females in the 300 mg/kg/day group and 7 of 12 females in the 900 mg/kg/day group). Mineralization at this location (often noted as the corticomedullary junction) is a common finding in rats (Greaves, 2007c). The incidence of mineralization in the WIL Research historical control database was 22.47% with an individual control group incidence range of 22-77.78%. In addition, mild coagulative necrosis was observed in the liver of one 900 mg/kg/day group female (no. 81969). The observation was characterized by multiple random foci of coagulative necrosis with subacute inflammation throughout the liver.

There were no other test substance-related histologic changes. Remaining histologic changes were considered to be incidental findings or related to some aspect of experimental manipulation other than administration of the test substance. There was no test substance-related alteration in the prevalence, severity, or histologic character of those incidental tissue alterations.

6.2.9.4. DISCUSSION OF MICROSCOPIC FINDINGS

Test substance-related microscopic findings were noted at 100, 300, and 900 mg/kg/day in males and females. Relationships were suspected between gross necropsy, organ weight, clinical pathology, and histopathology observations, as presented in Text Table 6. These proposed relationships were based on subjective interpretation rather than a statistical analysis of correlation.

Text Table 6. Correlations of Selected Observations

Necropsy	Organ Weight	Clinical Pathology	Histopathology
Kidneys – pale	↑ kidney weight	↑ serum creatinine	Droplets, hyaline Nephropathy, hyaline droplet
Liver	↑ liver weight	-	Centrilobular hepatocellular hypertrophy
Thyroids/Parathyroids	↑ thyroid/parathyroid weights	-	Epithelial hypertrophy and cytoplasmic vacuolation

- = No correlate

Unique to the male rats were prominent hyaline droplets and hyaline droplet nephropathy. While hyaline droplets are considered a normal finding in untreated male rats (Greaves, 2007c), the aggregation and condensation pattern of the droplets was more prominent in the test substance treated male rats. In addition to prominent and aggregated hyaline droplets, radiating arrays of basophilic tubules throughout the cortex, and granular casts at the inner stripe of the outer medulla comprised a constellation of observations characteristic of hyaline droplet nephropathy (Hard, 2008). The hyaline droplet nephropathy correlated to the grossly observed pale kidneys and the increased absolute and relative kidney weights as well as the increased mean serum creatinine levels. The test substance-related renal changes are considered adverse in the rat, but are specific to this species, and toxicologically unimportant in humans.

Cortical lymphoid depletion was observed in the thymus of the 900 mg/kg/day group females and 1 of the 100 mg/kg/day group females. Thymic lymphoid depletion may be a result of the test substance but can also occur secondary to stress (Greaves, 2007d). As lymphoid depletion can be associated with stress, the histologic changes are considered non-adverse.

Epithelial hypertrophy and cytoplasmic vacuolation of the thyroid gland was observed in the test substance-treated groups and correlated to the increased relative thyroid/parathyroid weights in the 900 mg/kg/day group males. Follicular epithelial

hypertrophy can occur with enzyme induction and increased hepatic clearance of thyroxine (Curran, 1991). The changes in the thyroid gland are not considered an adverse effect of the test substance and are considered to be specific to the rat, with no toxicologic significance to humans.

Centrilobular hepatocellular hypertrophy was observed in the 900 mg/kg/day group males and females. Centrilobular hepatocellular hypertrophy correlated to the increased absolute and relative liver weights. Centrilobular hepatocellular hypertrophy and higher liver weights were consistent with hepatocellular enzyme induction (Greaves, 2007e). This change is considered adaptive and hence non-adverse.

Cytoplasmic vacuolation of the zona fasciculata occurred in the adrenal cortex of the 100, 300, and 900 mg/kg/day group males and the 900 mg/kg/day group females. Cytoplasmic vacuolation can occur spontaneously (Frith *et al*., 2000) or as a result of pharmacologic effects (Greaves, 2007a). In the WIL Research historical control database, the overall incidence of minimal cytoplasmic vacuolation in age-matched male and female rats was 1.09% and 2.35%, respectively, with individual control group incidences of 20% for males and 40% for females. Cytoplasmic vacuolation can be associated with stress, and the histologic changes are considered non-adverse.

The positive control group (60 mg/kg/day CYC) was not examined histologically.

6.2.9.5. MICRONUCLEUS EVALUATION

Historical Control Data for Micronucleus Evaluation: Appendix J
Micronucleus Assay Report: Appendix K

Naphthenic acid did not produce a statistically significant ($p \leq 0.05$) increase in the mean percentage of micronucleated polychromatic erythrocytes (%MN-PCEs) or in the mean percentage of micronucleated normochromatic erythrocytes (%MN-NCEs) compared to the vehicle control. In addition, naphthenic acid did not produce a statistically significant change in the mean ratio of polychromatic to total erythrocytes (PCE:TE ratio) relative to the vehicle control. Severe cytotoxicity (PCE:TE ratio < 20% of the vehicle control) was

observed in 1 female rat at 900 mg/kg/day (no. 81964); therefore this animal was excluded from the calculation of means and statistics. The group mean values for both %MN-PCEs and PCE:TE ratios for the vehicle and positive control groups were within the values previously obtained by Midwest BioResearch (see Appendix J).

Naphthenic acid met the criteria for a negative response for the induction of bone marrow micronuclei under the conditions of this assay.

6.3. F_1 LITTER DATA

6.3.1. PND 0 LITTER DATA AND POSTNATAL SURVIVAL

Summary Data: Table S69, Table S70

Individual Data: Table A104, Table A105, Table A106

Historical Control Data: Appendix O

A test substance-related significant ($p<0.01$) reduction in the mean number of pups born, and consequently mean live litter size were observed in the 900 mg/kg/day group when compared to the vehicle control group. The mean number of pups born and the live litter size in this group (10.8 and 9.6 pups, respectively) were lower than the concurrent vehicle control group (14.1 and 13.9 pups, respectively) and below the minimum mean values (11.7 and 11.6 pups, respectively) in the WIL historical control data. Test substance-related lower postnatal survival was also noted in the 900 mg/kg/day group between birth and PND 0 (relative to number born), PND 0-1, 1-4, and from birth to PND 4. The differences were not statistically significant when compared to the vehicle control group; however, the values (90.1%, 78.9%, 82.6%, and 67.7%, respectively) were below the minimum mean values in the WIL historical control data (93.3%, 94.6%, 87.0%, and 83.8%, respectively).

A test substance-related, slightly lower (not statistically significant) mean number of pups born and consequently significantly ($p<0.05$) lower live litter size were observed in the 300 mg/kg/day group. As a result, postnatal survival on PND 0 (relative to number born) in the 300 mg/kg/day group was also slightly lower (90.2%) than the vehicle control

group (99.3%). Postnatal survival in the 300 mg/kg/day group was similar to the vehicle control group during PND 0-1 and 1-4; however, as a result of the effects noted on PND 0, postnatal survival in this group during birth to PND 4 was lower (88.0%) compared to the vehicle control group (98.1%).

The mean number of pups born, live litter size, and the percentage of males at birth in the 100 mg/kg/day group were similar to the vehicle control group values. Postnatal survival in the 100 mg/kg/day group was unaffected by test substance administration.

The mean number of pups born, live litter size, and the percentage of males at birth in the vehicle control group were similar to the sham control group values. Postnatal survival in this group on PND 0 (relative to number born) and during PND 0-1 was similar to the sham control group. During PND 1-4 and from birth to PND 4, postnatal survival in the vehicle control group was higher than the sham control group. However, an increase in survival is not of toxicological significance.

A significantly ($p<0.01$) lower mean number of pups born, and consequently slightly lower (not statistically significant) mean live litter size were observed in the positive control group when compared to the sham control group. These values were within the WIL historical control ranges and therefore these differences were attributed to biological variability. The percentage of males at birth and postnatal survival in the positive control group was similar to the sham control group.

6.3.2. GENERAL PHYSICAL CONDITION

Summary Data: Table S71
Individual Data: Table A107

An increase in the incidence of body cool to the touch was noted in the F_1 pups in the 900 mg/kg/day group. In addition, 4 pups in 1 litter in this group were noted with small stature which correlated to the lower birth weight observed in the 900 mg/kg/day group. The general physical condition of all F_1 pups in the 100 and 300 mg/kg/day groups were unaffected by test substance administration. Pups (litters) that were found dead or

euthanized *in extremis* numbered 6(2), 1(1), 0(0), 12(5), 38(8), and 0(0) in the sham control, vehicle control, 100, 300, and 900 mg/kg/day and positive control groups, respectively. Six, 1, 0, 1, 9, and 0 pups in the same respective groups were missing and presumed to have been cannibalized.

6.3.3. OFFSPRING BODY WEIGHTS

Summary Data: Table S72, Table S73

Individual Data: Table A108, Table A109

Historical Control Data: Appendix O

Lower mean pup birth weights (PND 1) noted for the 900 mg/kg/day group (18.6% and 15.2% lower in males and females, respectively) in combination with lower mean body weight gains during PND 1-4 resulted in lower mean body weights in this group on PND 4 (25.8% and 19.8% lower in males and females, respectively). All of these differences were significant ($p<0.05$ or $p<0.01$) when compared to the vehicle control group.

Mean male and female pup body weights and body weight changes in the 100 and 300 mg/kg/day groups were unaffected by test substance administration during PND 1-4. No statistically significant differences from the vehicle control group were noted.

Mean male and female pup body weights and body weight changes in the vehicle and positive control groups were similar to the sham control group during PND 1-4. No statistically significant differences were noted.

6.3.4. NECROPSIES OF PUPS (UNSCHEDULED DEATHS)

Summary Data: Table S74

Individual Data: Table A110

The numbers of pups (litters) found dead or euthanized *in extremis* during PND 0-4 numbered 6(2), 1(1), 0(0), 12(5), 38(8), and 0(0) pups (litters) in the sham control, vehicle control, 100, 300, and 900 mg/kg/day, and positive control groups, respectively.

No internal findings that could be attributed to F_0 parental test substance administration were noted at the necropsies of the pups that were found dead or euthanized *in extremis*. In the 900 mg/kg/day group, pup no. 81964-09 had renal papilla(e) not fully developed (Woo and Hoar grade 1) and pup no. 81918-01 had a fractured parietal bone. Aside from the presence or absence of milk in the stomach, no other internal findings were noted.

7. DISCUSSION

This study was designed to evaluate the potential toxic effects of the test substance when administered to rats for a minimum of 28 days and to evaluate the potential of the test substance to affect male and female reproductive performance such as gonadal function, mating behavior, conception, parturition, and early postnatal development. In addition, a micronucleus assay was performed to assess the potential of the test substance to induce micronuclei in polychromatic erythrocytes (PCEs) in the rat bone marrow following at least 28 consecutive days of treatment administered by oral gavage. This assay evaluates compounds for *in vivo* clastogenic activity and/or disruption of the mitotic apparatus.

F_0 parental toxicity was manifested at 900 mg/kg/day as evidenced by adverse clinical findings and lower mean body weight gains. Test substance-related clinical findings generally noted for the majority of females in this group included hunched posture, rocking, lurching, and/or swaying while ambulating, walking on tiptoes, hypoactivity, and shallow respiration. In addition, single occurrences of tremors and rales were noted in the 900 mg/kg/day group females. In contrast, only hunched posture was observed for half of the males in the 900 mg/kg/day group. These findings were noted at approximately 1 hour following dose administration primarily during the first 2 weeks of treatment. Yellow material on the ventral abdominal, ventral thoracic, anogenital, and/or urogenital areas and red material around the mouth was observed for the majority of males and females in the 900 mg/kg/day group at the detailed physical examinations and/or approximately 1 hour following dose administration and was considered adverse. At the detailed physical examinations, test substance-related higher incidences of hair loss on the left hindlimb, ventral abdominal, and ventral thoracic areas were observed for females in the 900 mg/kg/day group while hair loss on the ventral abdominal and urogenital areas was observed for the majority of males in this group. These clinical findings were noted as early as study day 7 and generally continued throughout the study. Hair loss is not considered to be toxicologically relevant and therefore the hair loss noted in the 900 mg/kg/day group was not considered to be adverse. In addition, non-adverse salivation or evidence thereof (clear material around the mouth, nose, and/or on the

forelimbs) was noted at all dosage levels at the detailed physical examinations, at the time of dosing, and/or approximately 1 hour following dose administration generally throughout the study.

Lower mean body weight gains and corresponding reduced food consumption were noted in the 900 mg/kg/day group males throughout the treatment period which resulted in a mean body weight that was 8.2% lower than the vehicle control group on study day 27. Although lower mean food consumption was noted in the 900 mg/kg/day group females during the pre-mating period (study days 0-13), mean body weight gain in this group was similar to the vehicle control group during this time. However, lower mean body weight gains, without corresponding effects on mean food consumption, were noted in this group during gestation days 14-20 and when the overall gestation treatment period was evaluated which resulted in a mean body weight that was 8.4% lower than the vehicle control group on gestation day 20. Lower mean body weights (7.6% lower) and reduced food consumption were observed in the 900 mg/kg/day group during the lactation treatment period. The lower mean body weight noted in the 900 mg/kg/day group females during lactation was due to lower mean body weight gains during the last week of gestation and in the absence of an effect on mean body weight gain during lactation, the reduced food consumption noted in this group was not considered adverse.

Test substance-related lower mean body weights were noted in the 900 mg/kg/day group males at the physiological observations during study week 4 and in the 900 mg/kg/day group females on lactation day 4. No other test substance-related changes in F_0 FOB parameters were noted at 100, 300, or 900 mg/kg/day and no test substance-related effects on motor activity patterns were noted at any dosage level. There were no test substance-related effects on F_0 reproductive performance, gestation length, and parturition at any dosage level.

Test substance-related alterations in hematology and serum chemistry parameters noted in the 300 and 900 mg/kg/day group males and females were generally of small

magnitude, within the WIL historical control data range, and were therefore considered toxicologically unimportant and non-adverse.

A test substance-related macroscopic finding of pale kidneys was noted in the 900 mg/kg/day group males. The finding of pale kidneys correlated with the increased kidney weight, increased mean serum creatinine, and microscopic findings of hyaline droplets and hyaline droplet nephropathology observed in this group. The test substance-related renal changes were considered adverse in the rat, but are specific to that species, and toxicologically unimportant in humans. Furthermore, the microscopic observations of hyaline droplets and hyaline droplet nephropathy are consistent with the accumulation of alpha 2u-globulins, however, immunohistochemical staining would be required for definitive identification of the eosinophilic proteinaceous droplets (Hard, 2008). Increased mean liver weights were noted in the 300 and 900 mg/kg/day group males and females. In the 900 mg/kg/day group, these differences in liver weights correlated with microscopic findings of centrilobular hepatocellular hypertrophy in the males and females. Test substance-related higher mean thyroid/parathyroid weight with corresponding epithelial hypertrophy and cytoplasmic vacuolation was noted in the 900 mg/kg/day group males. Microscopic findings of cytoplasmic vacuolation of the adrenal cortex were noted in the 900 mg/kg/day group females and the 100, 300, and 900 mg/kg/day group males. Lymphoid cortical depletion in the thymus was observed in the 900 mg/kg/day group females and 1 of the 100 mg/kg/day group females. These findings were not associated with any organ weight changes in these groups. The test substance-related changes in the liver, thyroids, thymus, and adrenals were considered to be non-adverse. The centrilobular hypertrophy in the liver was consistent with enzyme induction. The epithelial hypertrophy and cytoplasmic vacuolation in the thyroid was considered adaptive and the lymphoid cortical depletion in the thymus and adrenal cortical vacuolation are considered a result of stress.

F_1 neonatal toxicity was observed in the 300 and 900 mg/kg/day groups. A decrease in the number of corpora lutea, the former number of implantation sites, a lower number of

F_1 pups born, and consequently lower mean live litter size were observed in the 300 and/or 900 mg/kg/day groups. In addition, lower postnatal survival was noted in the 900 mg/kg/day group between birth and PND 4 as well as an increase in the number of pups in this group with a body cool to the touch and small stature. Test substance-related lower mean F_1 male and female body weights and body weight gains were also noted in the 900 mg/kg/day group.

Naphthenic acid met the criteria for a negative response for the induction of bone marrow micronuclei under the conditions of this assay.

8. CONCLUSIONS

Adverse behavioral-related clinical findings, lower mean body weights, lower mean body weight gains, and/or reduced food consumption were noted in the 900 mg/kg/day group males and females during the treatment periods. Therefore, under the conditions of this screening study the no-observed-adverse-effect-level (NOAEL) for F_0 systemic toxicity was considered to be 300 mg/kg/day for males and females when naphthenic acid was administered orally by gavage to Crl:CD(SD) rats. Although a lower mean body weight gain was noted at the physiological observations in the 900 mg/kg/day group males during study week 4 and in the 900 mg/kg/day group females on lactation day 4, no other effects on FOB parameters and no effects on locomotor activity were noted at any dosage level. Based on these results, the NOAEL for F_0 neurobehavioral toxicity was 900 mg/kg/day for males and females. No test substance-related effects on F_0 reproductive performance, gestation length, parturition, or reproductive organs were noted at any dosage level. However, a lower mean number of corpora lutea and former implantation sites, lower mean number of pups born, and/or lower live litter size were noted in the 300 and 900 mg/kg/day groups. In addition, lower postnatal survival, increased incidences of body cool to the touch and small stature, and lower mean pup body weights and body weight gains were observed in the 900 mg/kg/day group. Based on these results, the NOAEL for F_0 reproductive toxicity and F_1 neonatal toxicity was considered to be 100 mg/kg/day.

Naphthenic acid met the criteria for a negative response for the induction of bone marrow micronuclei under the conditions of this assay.

9. REPORT REVIEW AND APPROVAL

Report Authored and Approved By:

[redacted]

Staff Toxicologist, Developmental
and Reproductive Toxicology
Study Director

30 Aug 2012
Date

Report Prepared By:

[redacted]

Study Analyst

30 Aug 2012
Date

Report Reviewed By:

[redacted]

Associate Director, Neurosciences
and Head of Juvenile Toxicology

30 Aug 2012
Date

[redacted]

Senior Director, Developmental and
Reproductive Toxicology

30 Aug 2012
Date

10. QUALITY ASSURANCE STATEMENT

Date(s) of Inspection(s)	Phase Inspected	Date(s) Findings Reported to Study Director	Date(s) Findings Reported to Management
23-Sep-2010	Oral Gavage Test Article Administration	23-Sep-2010	22-Oct-2010
21-Oct-2010	Clinical Pathology Blood Collection and Processing	21-Oct-2010	30-Nov-2010
21-Oct-2010	Necropsy with Bone Marrow Collection	21-Oct-2010	30-Nov-2010
27-Oct-2010	Trimming of Tissues	27-Oct-2010	30-Nov-2010
02-Nov-2010	Functional Observational Battery	02-Nov-2010	28-Dec-2010
06-Dec-2010, 15-Dec-2010	Study Records (I-1)	15-Dec-2010	26-Jan-2011
06-Dec-2010, 07-Dec-2010, 11-Dec-2010, 15-Dec-2010	Study Records (I-2)	15-Dec-2010	26-Jan-2011
14-Dec-2010, 15-Dec-2010	Study Records (I-3)	15-Dec-2010	26-Jan-2011
14-Dec-2010, 15-Dec-2010	Study Records (I-4)	15-Dec-2010	26-Jan-2011
14-Dec-2010, 15-Dec-2010	Study Records (N-1)	15-Dec-2010	26-Jan-2011
14-Dec-2010, 15-Dec-2010	Study Records (N-2)	15-Dec-2010	26-Jan-2011
14-Dec-2010, 15-Dec-2010	Study Records (N-3)	15-Dec-2010	26-Jan-2011
15-Dec-2010	Study Records (Rx-1)	15-Dec-2010	26-Jan-2011
15-Dec-2010	Study Records (C-1)	15-Dec-2010	26-Jan-2011
12-Jan-2011, 13-Jan-2011, 14-Jan-2011	Draft Report (Tables only without Pathology Data)	14-Jan-2011	28-Feb-2011

Date(s) of Inspection(s)	Phase Inspected	Date(s) Findings Reported to Study Director	Date(s) Findings Reported to Management
14-Jan-2011	Draft Report (Statistical Analysis Summary)	14-Jan-2011	28-Feb-2011
25-Jan-2011	Trimming of Tissues	25-Jan-2011	28-Feb-2011
03-Feb-2011, 04-Feb-2011, 14-Feb-2011, 15-Feb-2011	Study Records (A-1 through A-6)	15-Feb-2011	23-Mar-2011
15-Feb-2011	Draft Report (Analytical Chemistry, Dose Formulation Analysis)	15-Feb-2011	23-Mar-2011
23-Feb-2011	Study Records (H-1)	23-Feb-2011	23-Mar-2011
23-Feb-2011	Study Records (H-2)	23-Feb-2011	23-Mar-2011
23-Feb-2011	Study Records (H-3)	23-Feb-2011	23-Mar-2011
23-Feb-2011	Study Records (Pathology Data)	23-Feb-2011	23-Mar-2011
23-Feb-2011	Draft Report (Test Substance Characterization)	23-Feb-2011	23-Mar-2011
23-Feb-2011	Draft Report (Pathology Report)	23-Feb-2011	23-Mar-2011
01-Mar-2011, 02-Mar-2011	Draft Report (Text with Pathology Tables)	02-Mar-2011	25-Apr-2011
24-Jul-2012	Final Pathology Report	24-Jul-2012	24-Jul-2012
30-Jul-2012	Final Report	30-Jul-2012	30-Jul-2012

This study was inspected in accordance with the applicable GLP Regulations, the SOPs of WIL Research, and the protocol and protocol amendments, with the following exceptions. The data located in Appendix C (Certificate of Analysis, Test Substance Analyses Report, and Material Safety Data Sheet) were the responsibility of the Sponsor or supplier. In addition, the data located in Appendix J (Historical Control Data for Micronucleus Evaluation) and Appendix K (Micronucleus Assay Report) were the responsibility of Midwest BioResearch, LLC. Review of the protocol and protocol

amendments as well as a yearly internal facility inspection are conducted by the WIL Research Quality Assurance Department.

This report accurately reflects the data generated during the study. The methods and procedures used in the study were those specified in the protocol, its amendments, and the SOPs of WIL Research.

[redacted]
Quality Assurance Representative

30 Aug 2012
Date

11. REFERENCES

Curran, P.G.; De Groot, L.J. The effect of hepatic enzyme-inducing drugs on thyroid hormones and thyroid gland. *Endocrine Reviews* **1991**, *12*, 135-150.

Dunn, O.J. Multiple comparisons using rank sums. *Technometrics* **1964**, *6(3)*, 241-252.

Dunnett, C.W. New tables for multiple comparisons with a control. *Biometrics* **1964**, *20*, 482-491.

Frith, C.H.; Botts, S; Jokinen, M.P.; Eighmy, J.J.; Hailey, J.R.; Morgan, S.J.; Chandra, M. Non-proliferative lesions of the endocrine system in rats. In *Guides for Toxicologic Pathology*. **2000**.

Gad, S.C. A neuromuscular screen for use in industrial toxicology. *Journal of Toxicology and Environmental Health* **1982,** *9(5-6),* 691-704.

Greaves, P. Endocrine Glands. In *Histopathology of Preclinical Toxicity Studies*. 3rd.; Associated Press: New York, NY **2007a**, 800-801

Greaves, P. Cardiovascular System. In *Histopathology of Preclinical Toxicity Studies.* 3rd.; Associated Press: New York, NY **2007b**, 276-277

Greaves, P. Urinary Tract. In *Histopathology of Preclinical Toxicity Studies.* 3rd Ed.; Associated Press: New York, NY **2007c**, 600-601, 615

Greaves, P. Haematopoietic and Lymphatic Systems. In *Histopathology of Preclinical Toxicity Studies*. 3rd Edition; Associated Press: New York, NY **2007d**, 118, 126

Greaves, P. Liver and Pancreas. In Histopathology of Preclinical Toxicity Studies. 3rd Ed.; Associated Press: New York, NY **2007e**, 466-475

Haggerty, G.C. Development of tier I neurobehavioral testing capabilities for incorporation into pivotal rodent safety assessment studies. *Journal of the American College of Toxicology* **1989,** *8(1),* 53-69.

Hard, G.C. Some aids to histological recognition of hyaline droplet nephropathy in ninety-day toxicity studies. *Toxicologic Pathology* **2008**, *36*, 1014-1017.

Hayashi, M.; Sofuni, T., and Ishidate, M (Jr.). An application of acridine orange fluorescent staining to the micronucleus test. *Mutation Research* **1983 Jun**; 120(4):241-7.

Hollander, M.; Wolfe, D.A. *Nonparametric Statistical Methods*, 2nd ed.; Hollander, M., Wolfe, D.A., Eds.; John Wiley and Sons, Inc.: New York, NY, **1999**; p 468.

Irwin, S. Comprehensive observational assessment: Ia. a systematic, quantitative procedure for assessing the behavioral and physiologic state of the mouse. *Psychopharmacologia* **1968,** *13,* 222-257.

Kuhl, A.J. A 14-Day Oral (Gavage) 14-Day and Pilot Prenatal Developmental Toxicity Study of Naphthenic Acid in Rats (Study No. WIL-402010). WIL Research Laboratories, LLC, Ashland, OH, **2010.**

Kruskal, W.H.; Wallis, W.A. Use of ranks in one-criterion variance analysis. *Journal of the American Statistical Association* **1952**, *47*, 583-621.

Meyer, O.; Tilson, H.; Byrd, W.; Riley, M. A Method for the Routine Assessment of Fore- and Hindlimb Grip Strength in Rats and Mice. *Neurobehavioral Toxicology* **1979**, *1*, 233-239.

Moser, V.C.; McCormick, J.P.; Creason, J.P.; MacPhail, R.C. Comparison of chlordimeform and carbaryl using a functional observational battery. *Fundamentals of Applied Toxicology* **1988,** *11(2),* 189-206.

Moser, V.C.; McDaniel, K.L.; Phillips, P.M. Rat strain and stock comparisons using a functional observational battery: baseline values and effects of amitraz. *Toxicology and Applied Pharmacology* **1991,** *108(2),* 267-283.

National Research Council. *Guide for the Care and Use of Laboratory Animals*, Institute of Laboratory Animal Resources, Commission on Life Sciences; National Academy Press: Washington, DC, **1996**.

O'Donoghue, J.L. Screening for neurotoxicity using a neurologically based examination and neuropathology. *Journal of the American College of Toxicology* **1989,** *8(1),* 97-115.

SAS® Proprietary Software, Version 9.1; SAS Institute, Inc.: Cary, NC, **2002-2003**.

Salewski, E. Färbemethode zum makroskopischen Nachweis von Implantationsstellen am Uterus der Ratte. [Staining method for a macroscopic test for implantation sites in the uterus of the rat]. *Naunyn - Schmiedebergs Archiv für Experimentelle Pathologie und Pharmakologie* **1964**, *247*, 367.

Snedecor, G.W.; Cochran, W.G. One-Way Classifications; Analysis of Variance. In *Statistical Methods*, 7th ed.; The Iowa State University Press: Ames, IA, **1980**; pp 215-237.

Steel, R.G.D.; Torrie, J.H. *Principles and Procedures of Statistics, A Biometrical Approach*, 2nd ed.; McGraw-Hill Book Company: New York, NY, **1980**; pp 504-506.

Stuckhardt, J.L.; Poppe, S.M. Fresh visceral examination of rat and rabbit fetuses used in teratogenicity testing. *Teratogenesis, Carcinogenesis and Mutagenesis* **1984**, *4*, 181-188.

12. DATA RETENTION

The Sponsor has title to all documentation records, raw data, slides, specimens, or other work product generated during the performance of the study. Any remaining dosing formulation samples will be discarded upon issuance of the final report; all remaining work product generated by WIL Research, including raw paper data and specimens, are retained in the Archives at WIL Research as specified in the study protocol. Appropriate supporting documentation for statistical analyses conducted and reported by BioSTAT Consultants, Inc., and data generated by Midwest BioResearch, LLC will be maintained in the Archives at WIL Research.

Reserve samples of the test substance, pertinent electronic storage media, and the original final report are retained in the Archives at WIL Research in compliance with regulatory requirements.

13. ABBREVIATIONS

The following abbreviations may apply to this report:

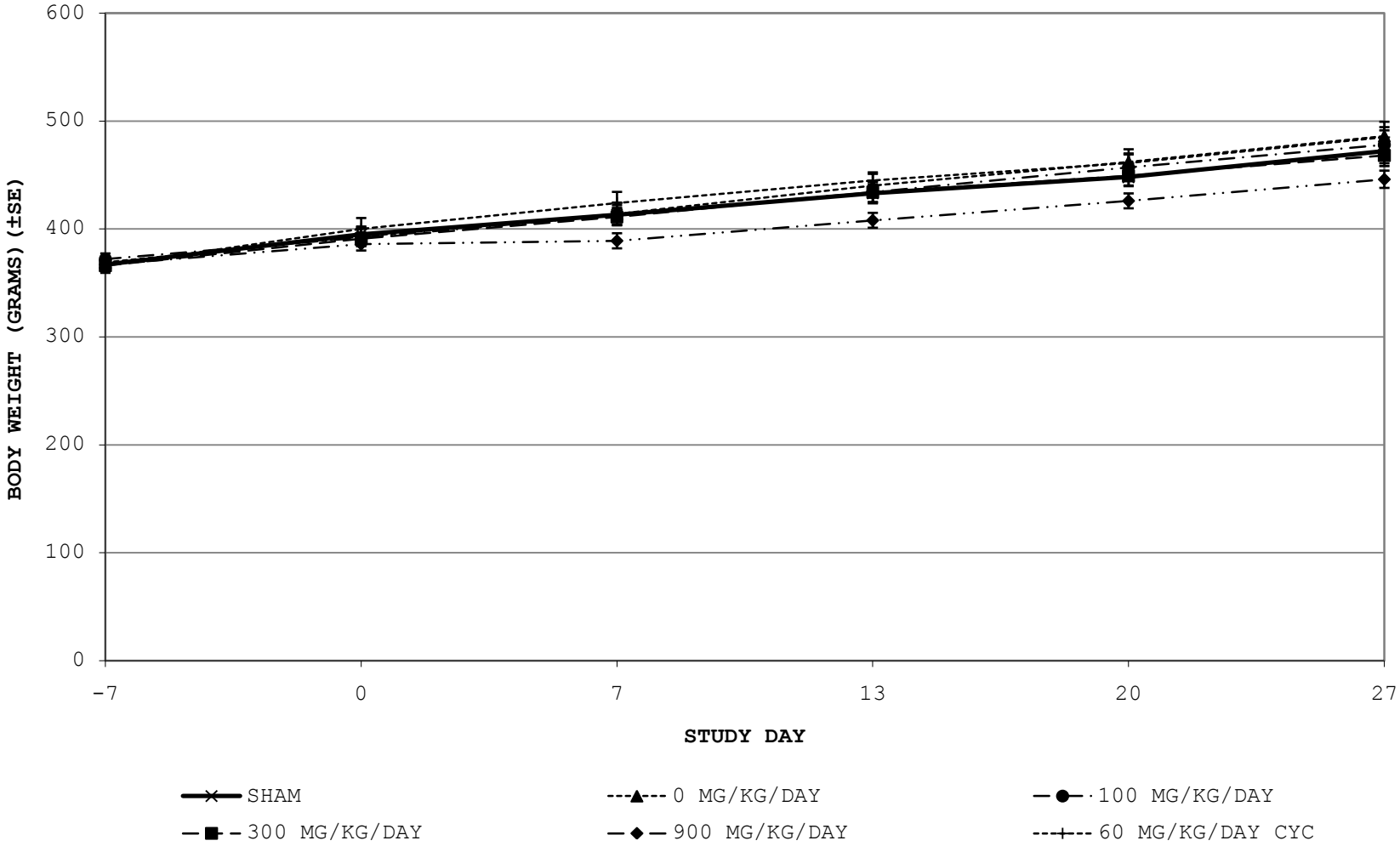
µ	-	micro
AAALAC	-	Association for Assessment and Accreditation of Laboratory Animal Care
ANOVA	-	analysis of variance
AUC	-	area under the curve
AVE	-	average response amplitude
BSA	-	Bovine serum albumin
cm	-	centimeter
C_{max}	-	maximum measured concentration of the analyte in plasma
CEO	-	correlates with externally observed
CYC	-	cyclophosphamide monohydrate
dB	-	decibels
dL	-	deciliter
EDTA	-	ethylenediaminetetracetic acid
EPA	-	Environmental Protection Agency
exp.	-	expiration
FOB	-	functional observational battery
g	-	gram
GLP	-	Good Laboratory Practices
hr	-	hour(s)
ICH	-	International Conference on Harmonisation
kg	-	kilogram
L	-	liter
M	-	molar
MAX	-	maximum response amplitude
mg	-	milligram
mL	-	milliliter
mm	-	millimeter
ms	-	milliseconds
mM	-	millimolar
NA	-	not applicable
no.	-	number
OECD	-	Organisation for Economic Cooperation and Development
OPPTS	-	Office of Prevention, Pesticides and Toxic Substances
PAS	-	Periodic Acid Schiff
PCEs	-	Polychromatic erythrocytes
PND	-	postnatal day
ppm	-	parts per million
QAU	-	Quality Assurance Unit
RMANOVA	-	repeated measure analysis of variance

RSD	-	Relative standard deviation
SOP	-	standard operating procedure
TSCA	-	Toxic Substances Control Act
WIL Research	-	WIL Research Laboratories, LLC
WTDMS™	-	WIL Toxicology Data Management System
wt.	-	weight
wts.	-	weights

FIGURES 1 - 19

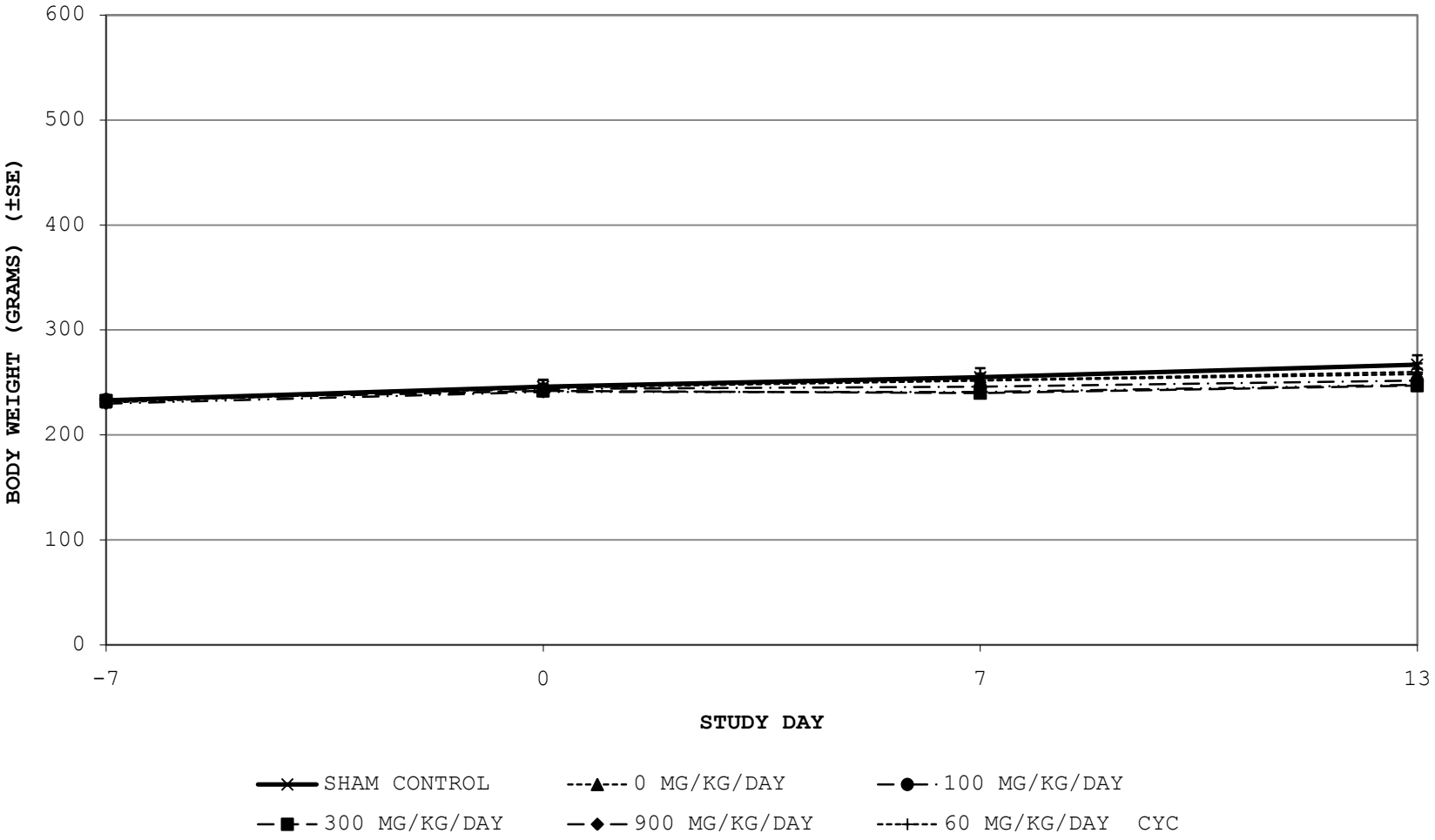
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 1 (F0 MALES)
SUMMARY OF BODY WEIGHTS [G]



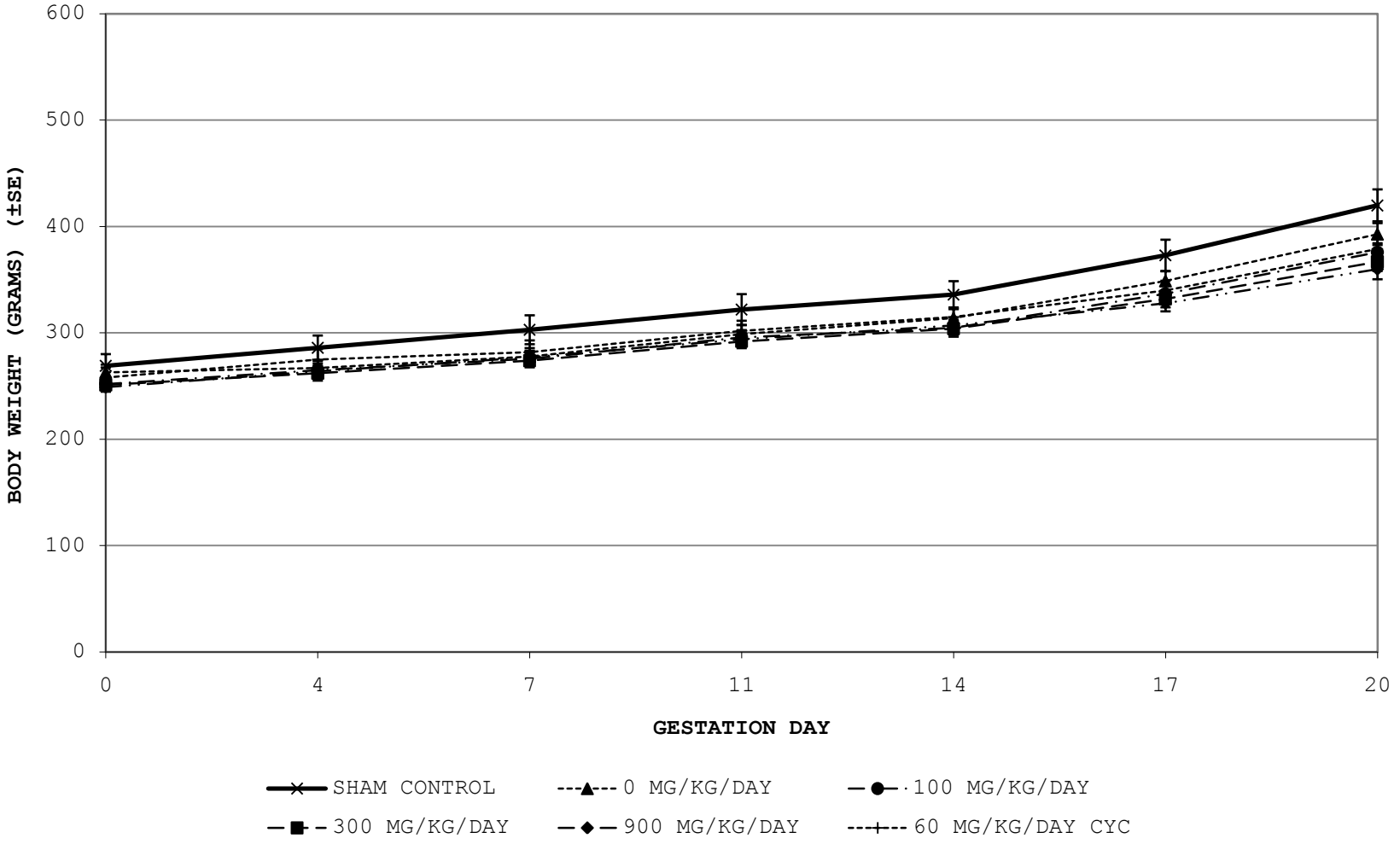
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 2 (F0 FEMALES)
SUMMARY OF BODY WEIGHTS [G]



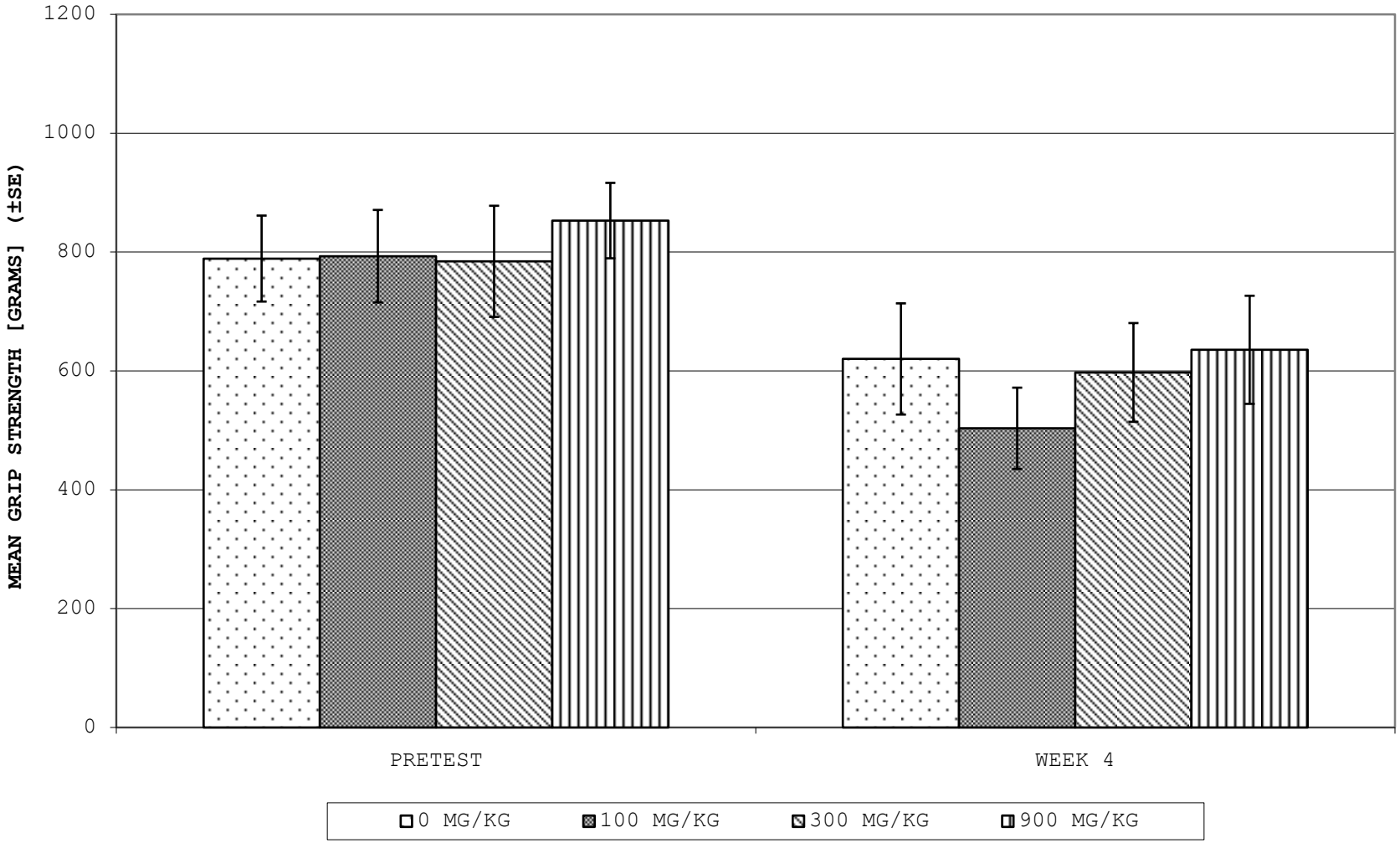
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 3 (F0 FEMALES)
SUMMARY OF BODY WEIGHTS DURING GESTATION [G]



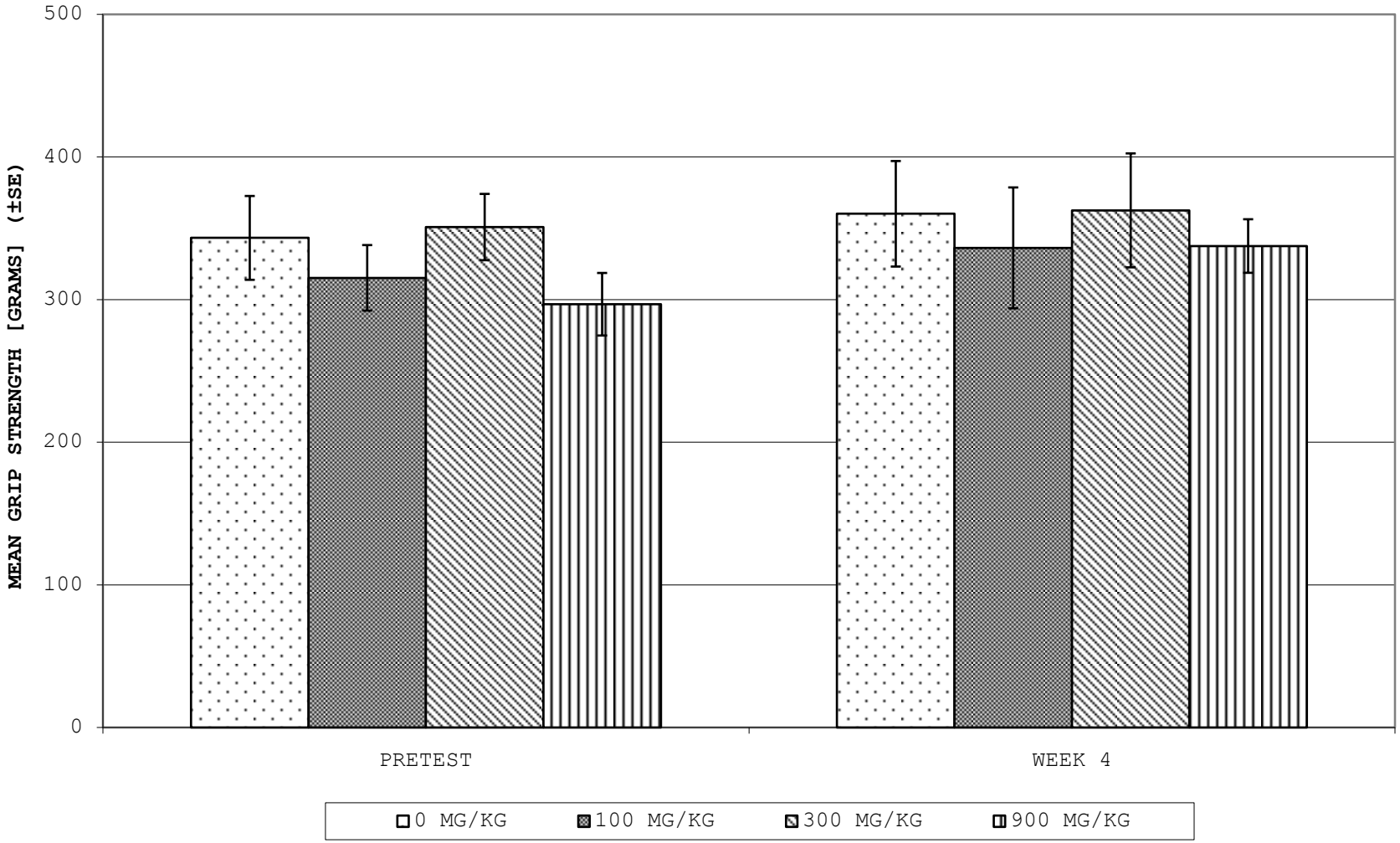
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 4 (F0 MALES)
SUMMARY OF MEAN FORELIMB GRIP STRENGTH [G]



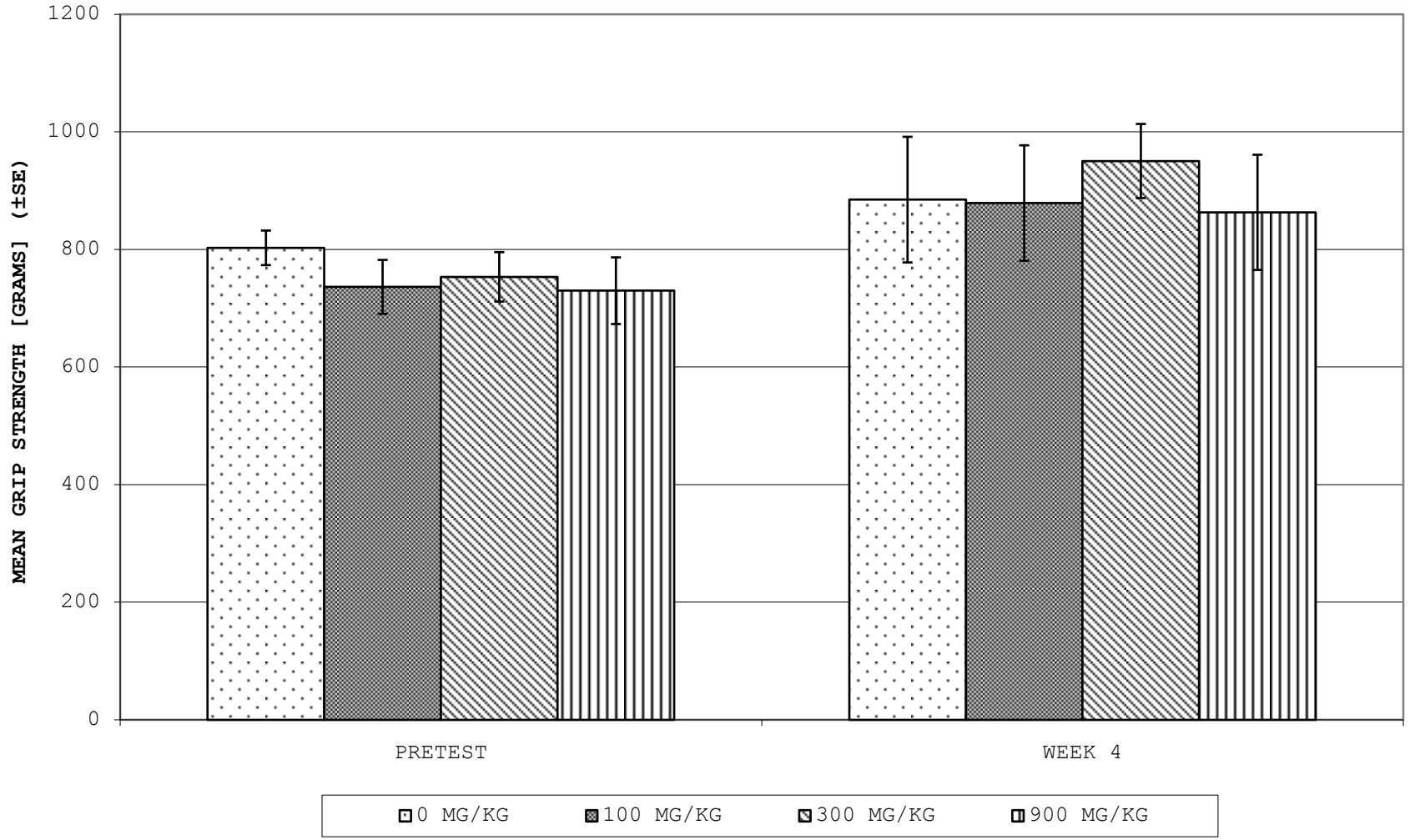
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 5 (F0 MALES)
SUMMARY OF MEAN HINDLIMB GRIP STRENGTH [G]



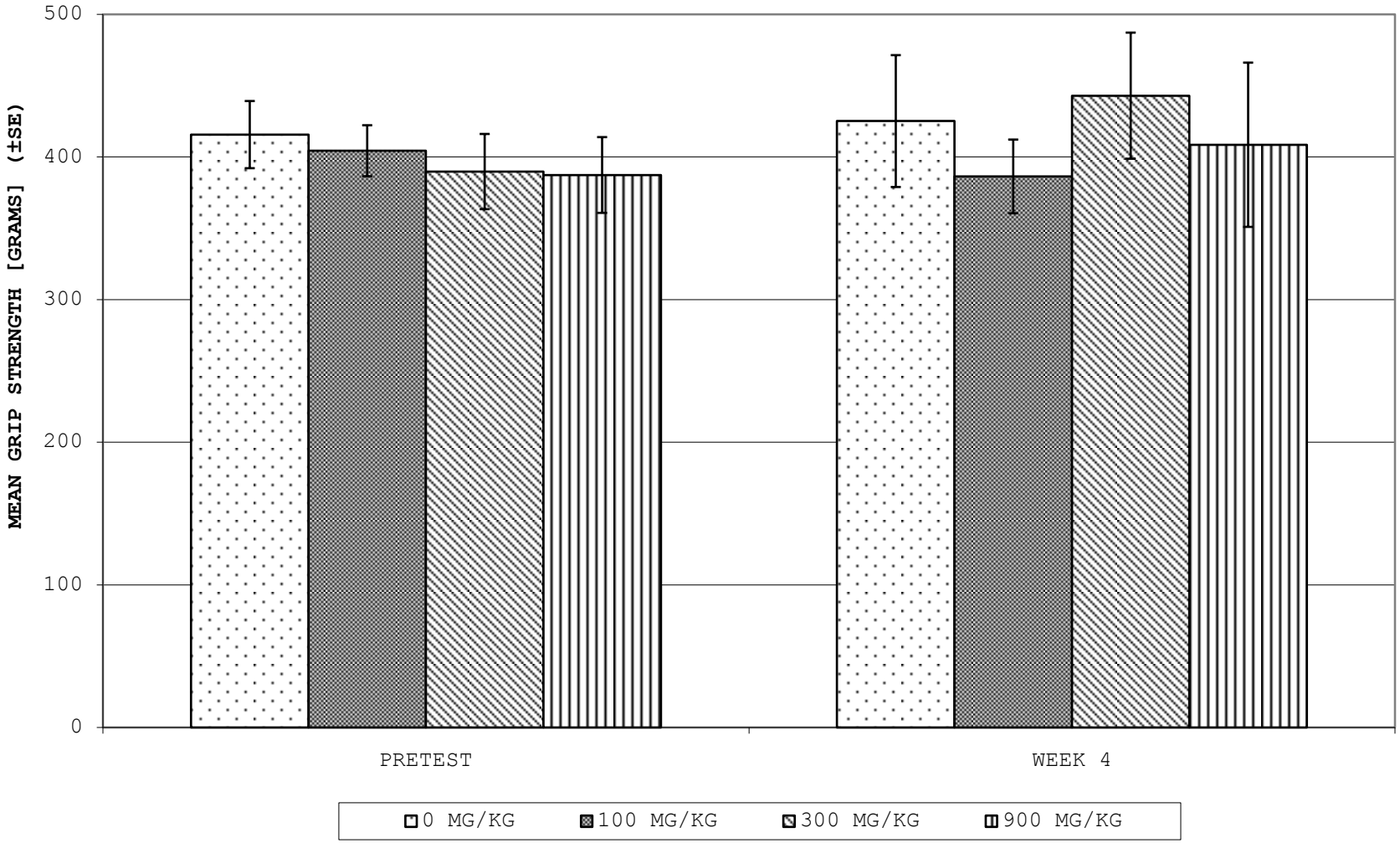
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 6 (F0 FEMALES)
SUMMARY OF MEAN FORELIMB GRIP STRENGTH [G]



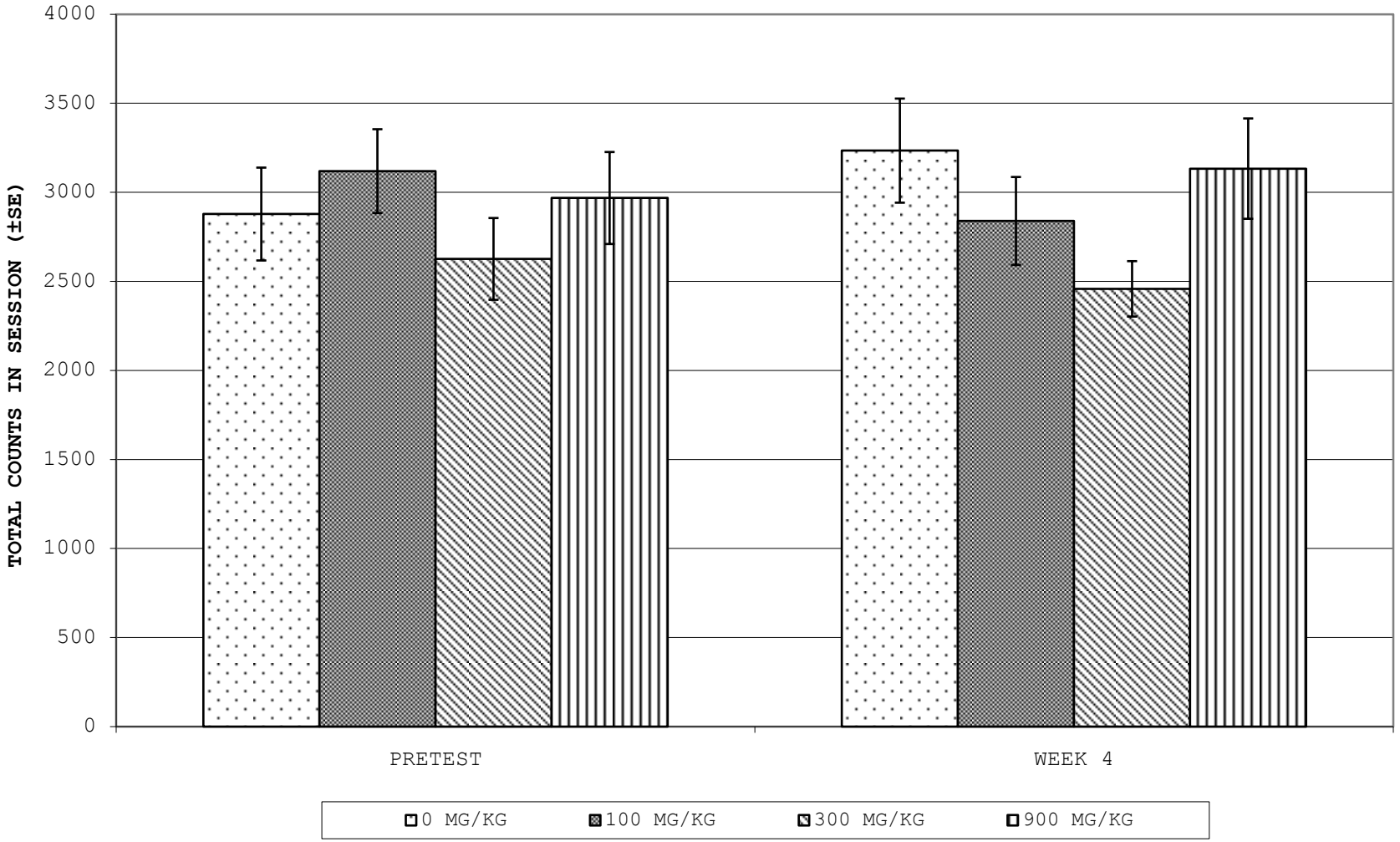
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAL PETROLEUM

FIGURE 7 (F0 FEMALES)
SUMMARY OF MEAN HINDLIMB GRIP STRENGTH [G]



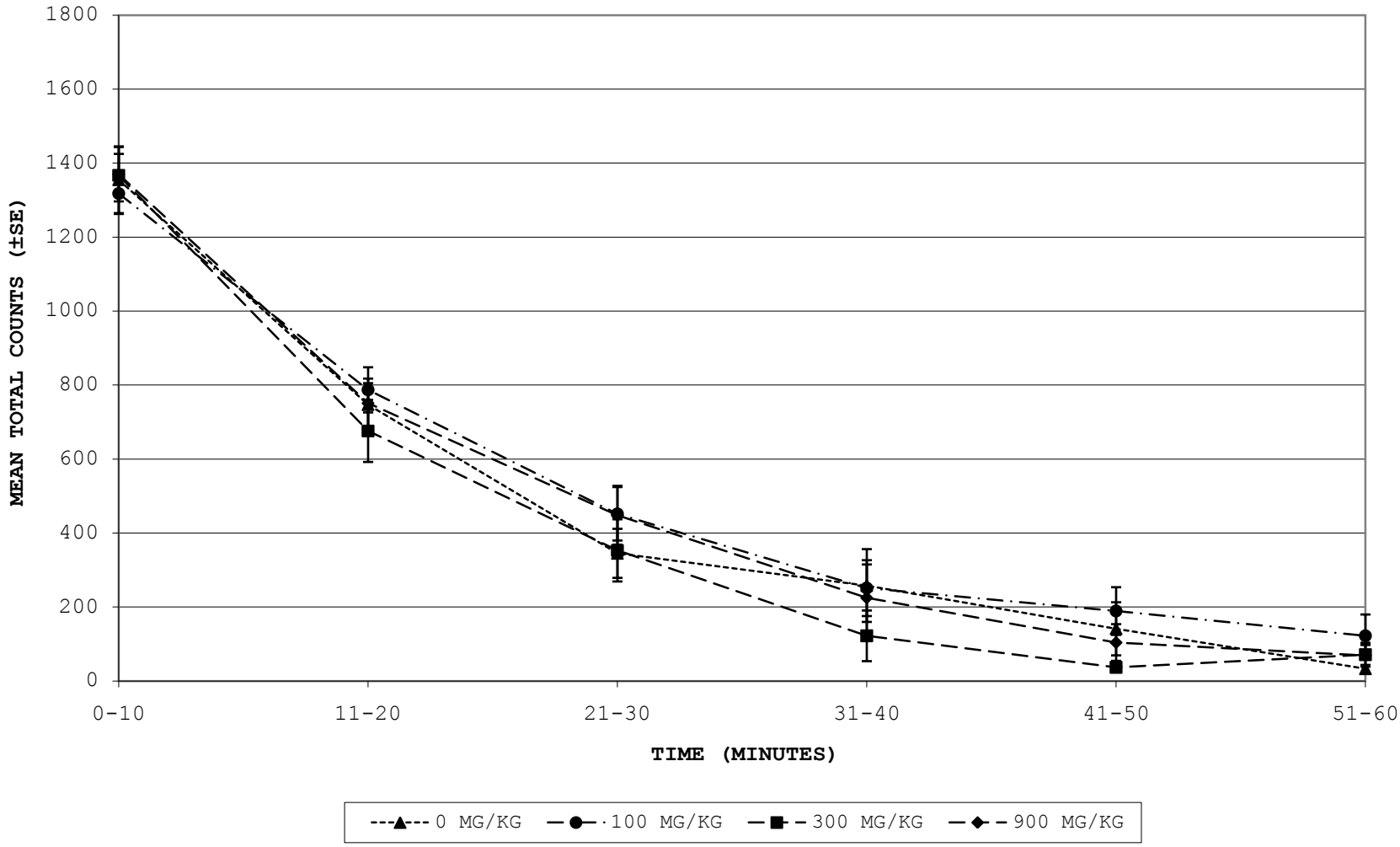
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 8 (F0 MALES)
SUMMARY OF MOTOR ACTIVITY TOTAL COUNTS BY SESSION



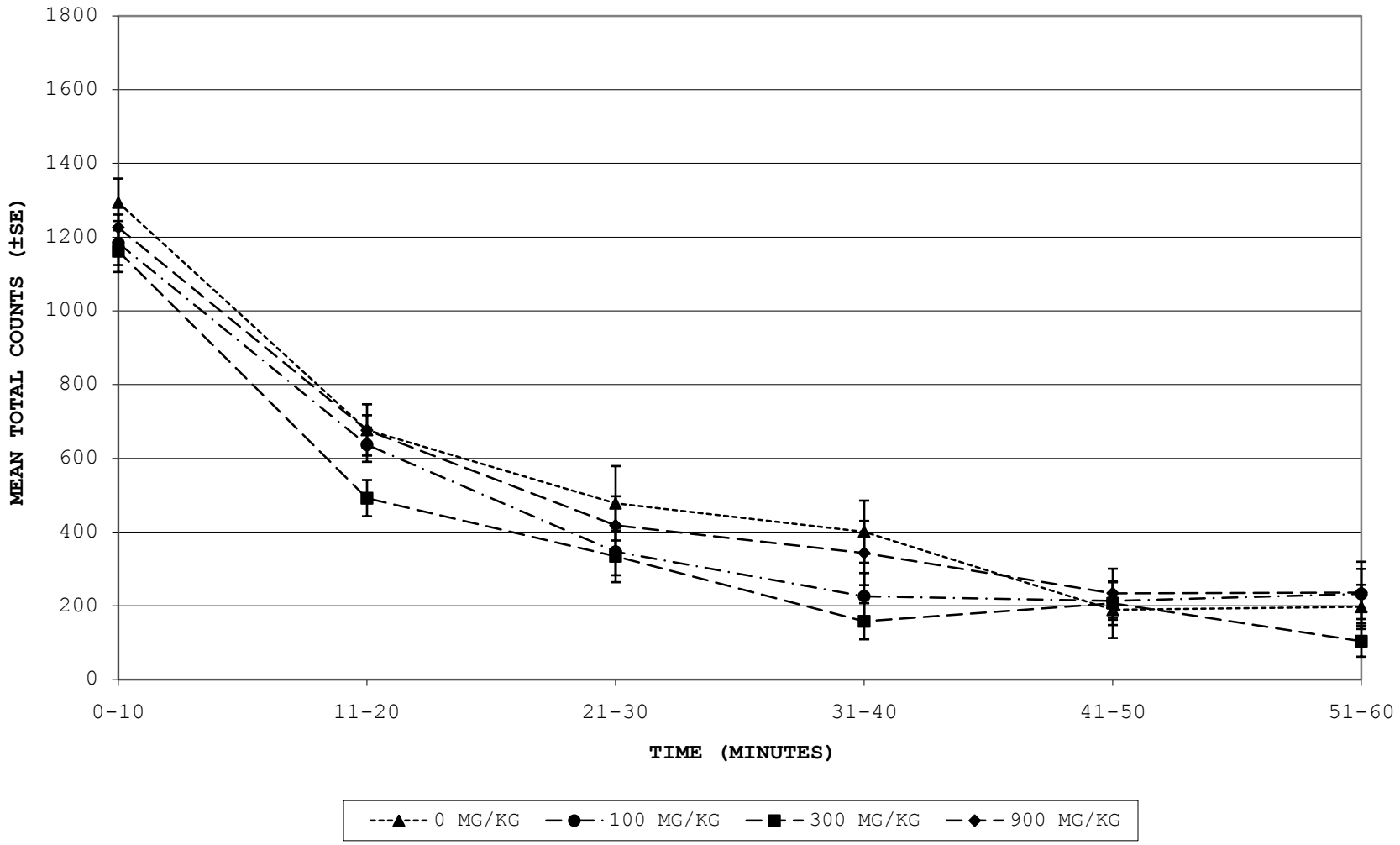
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 9 (F0 MALES - PRETEST)
SUMMARY OF MOTOR ACTIVITY TOTAL COUNTS



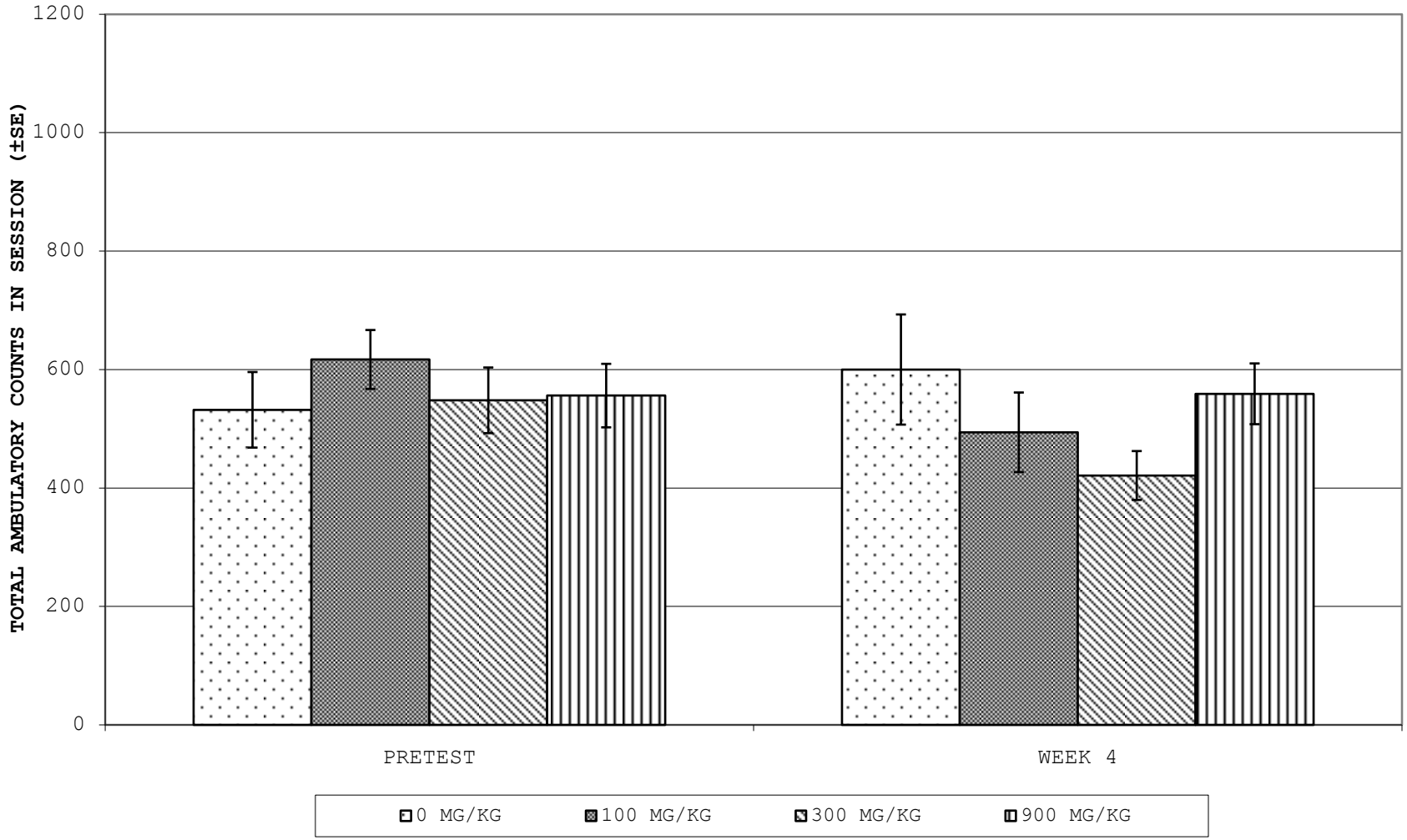
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 10 (F0 MALES - WEEK 4)
SUMMARY OF MOTOR ACTIVITY TOTAL COUNTS



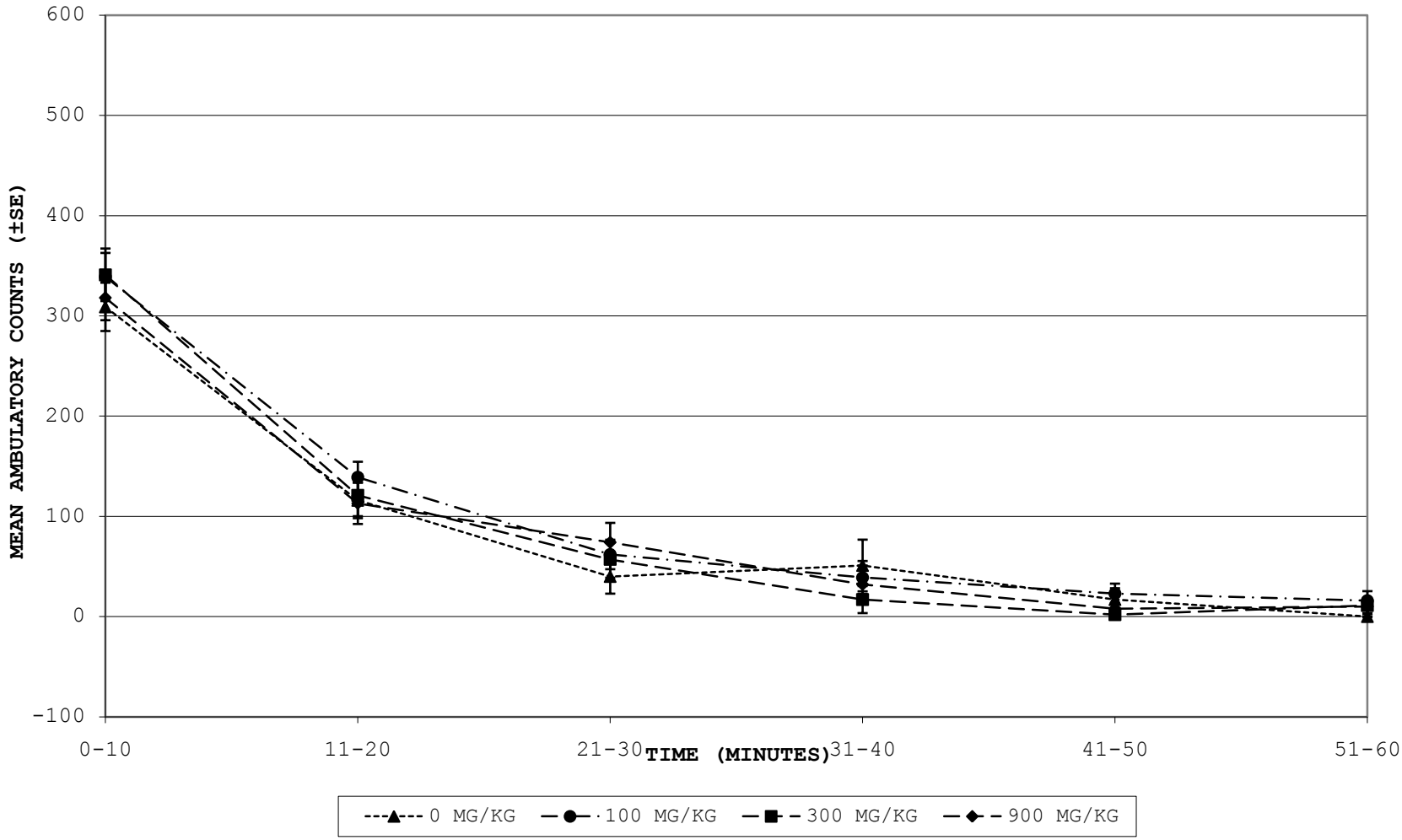
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 11 (F0 MALES)
SUMMARY OF MOTOR ACTIVITY AMBULATORY COUNTS BY SESSION



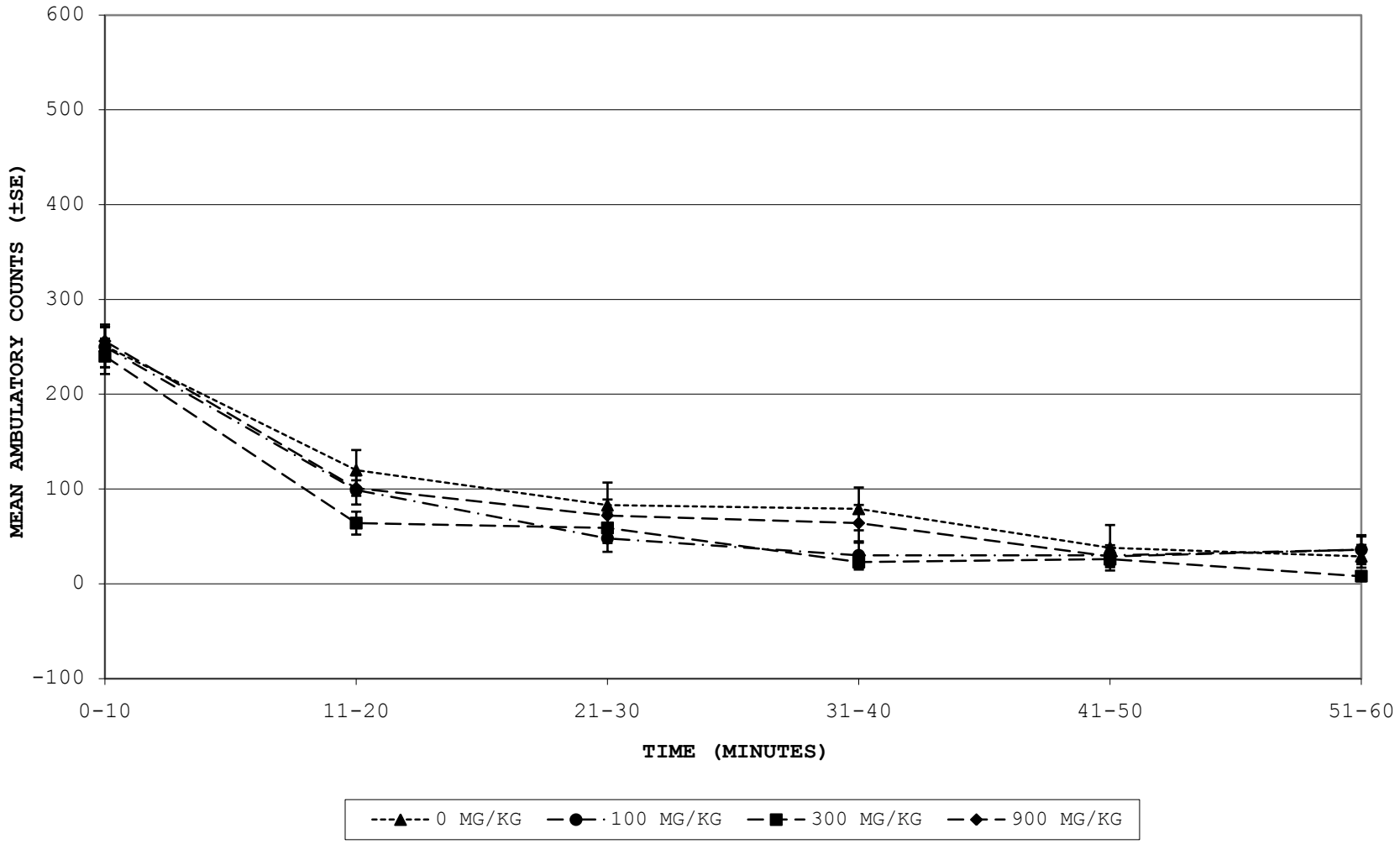
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 12 (F0 MALES - PRETEST)
SUMMARY OF MOTOR ACTIVITY AMBULATORY COUNTS



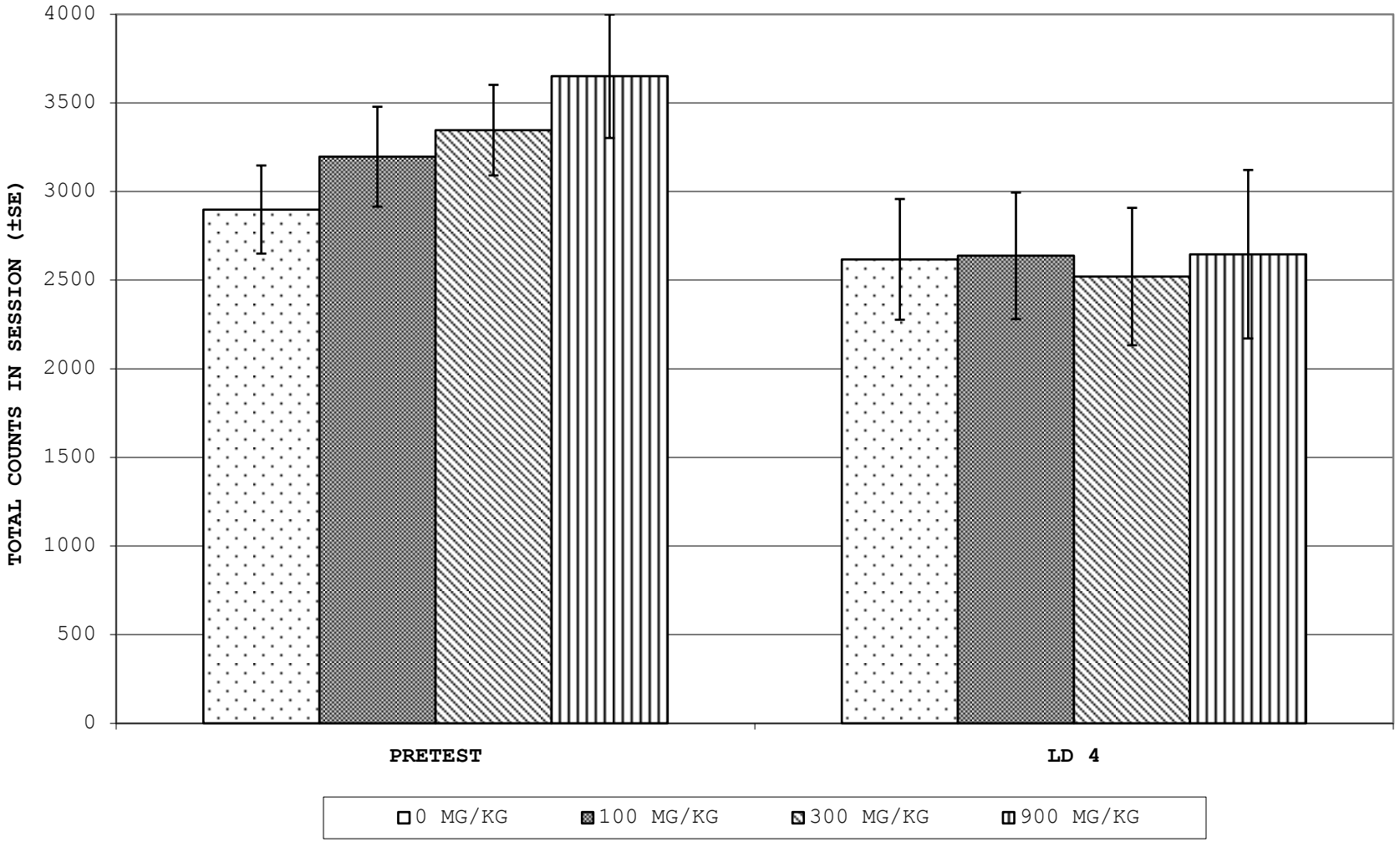
PROJECT NO.:WIL-402011M
SPONSOR:AMERICAN PETROLEUM

FIGURE 13 (F0 MALES - WEEK 4)
SUMMARY OF MOTOR ACTIVITY AMBULATORY COUNTS



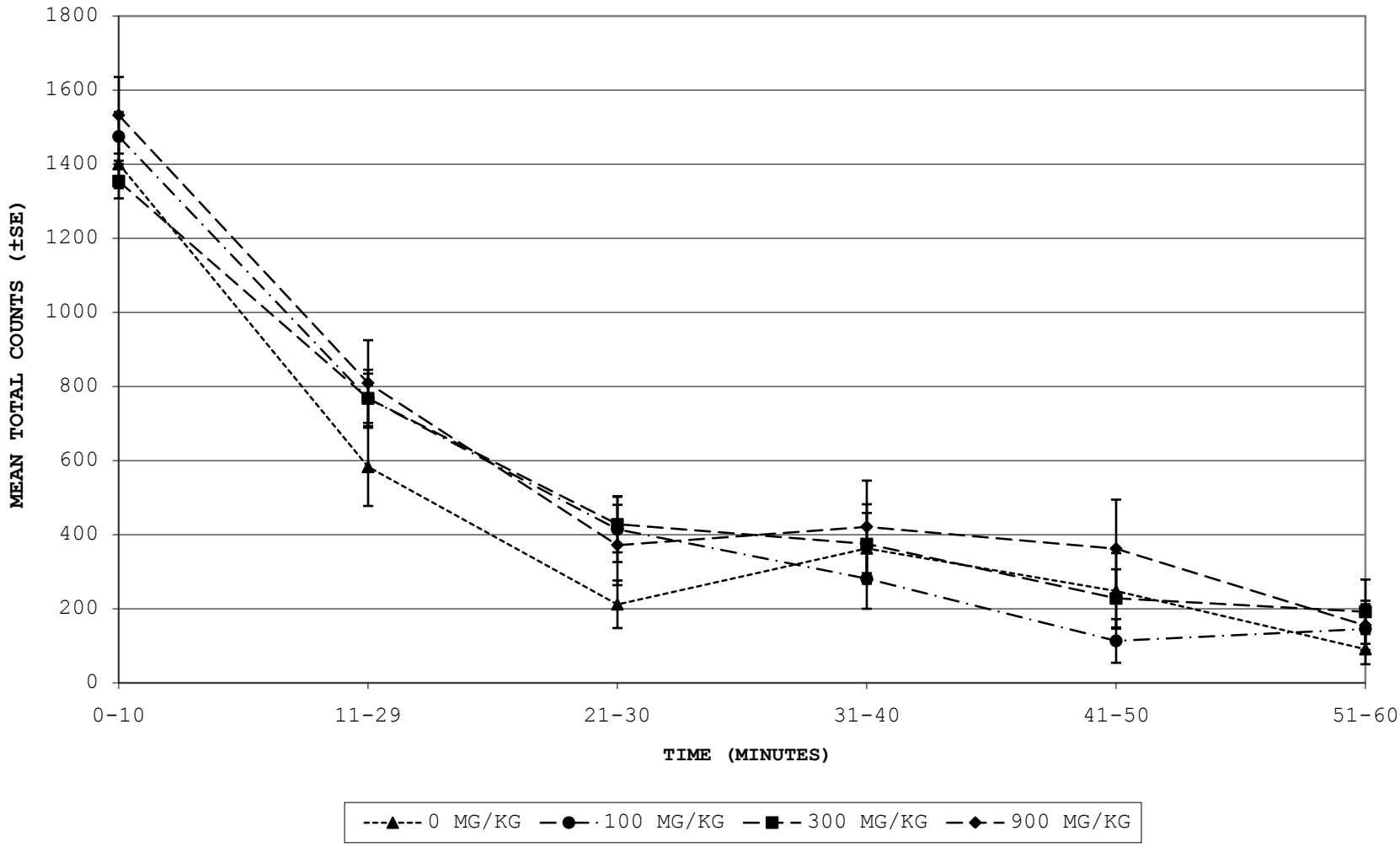
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 14 (F0 FEMALES)
SUMMARY OF MOTOR ACTIVITY TOTAL COUNTS BY SESSION



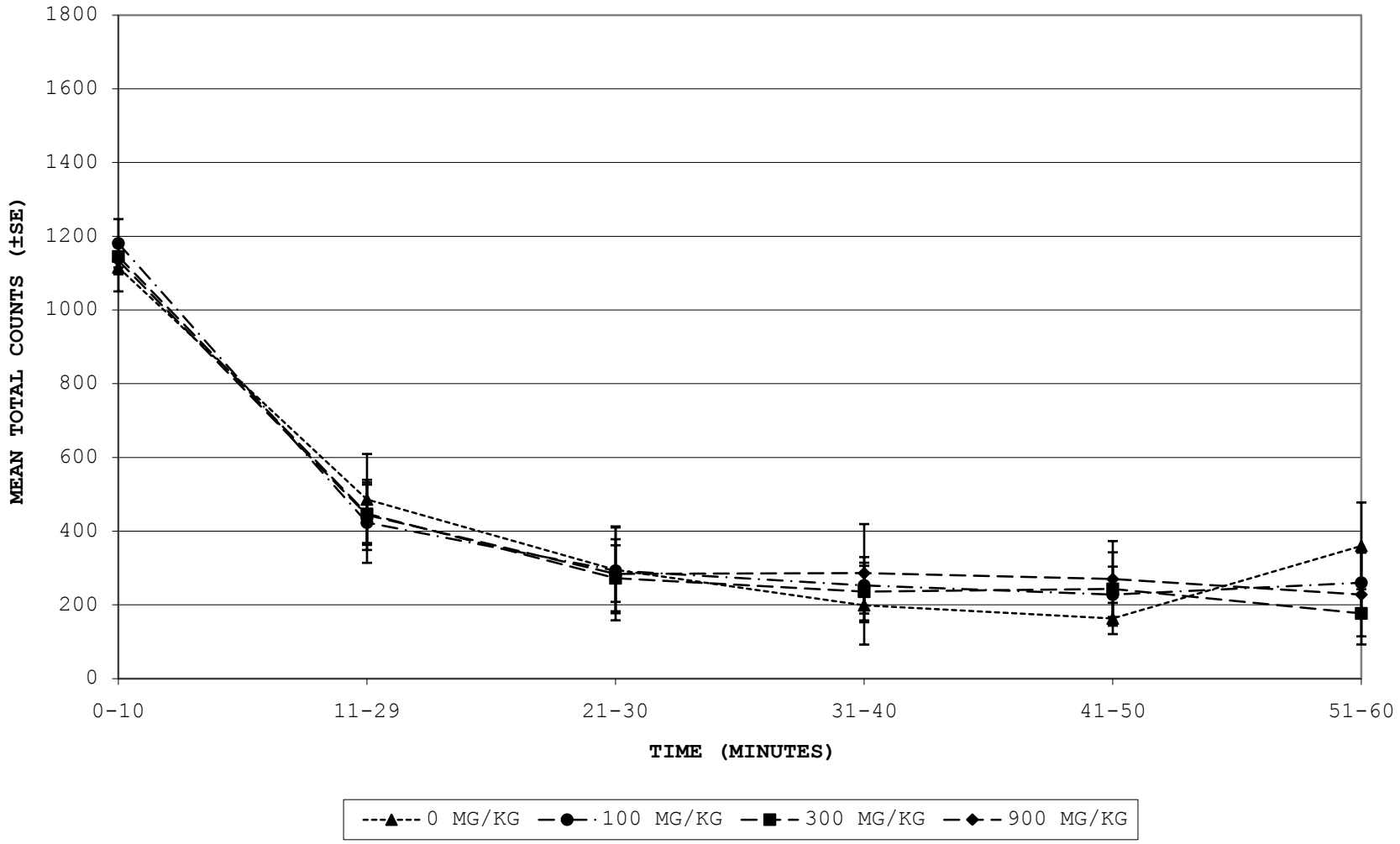
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 15 (F0 FEMALES - PRETEST)
SUMMARY OF MOTOR ACTIVITY TOTAL COUNTS



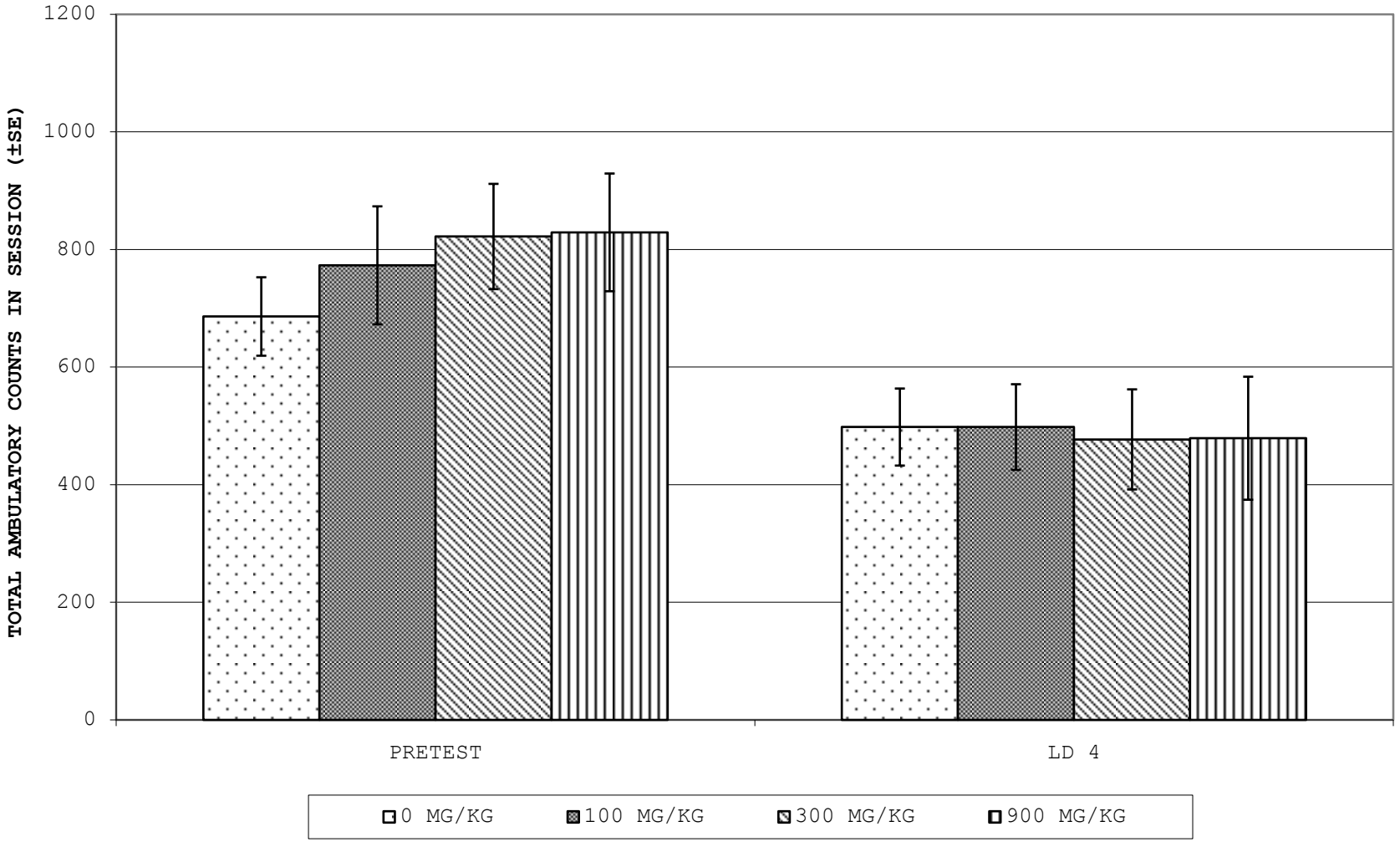
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 16 (F0 FEMALES - LACTATION DAY 4)
SUMMARY OF MOTOR ACTIVITY TOTAL COUNTS



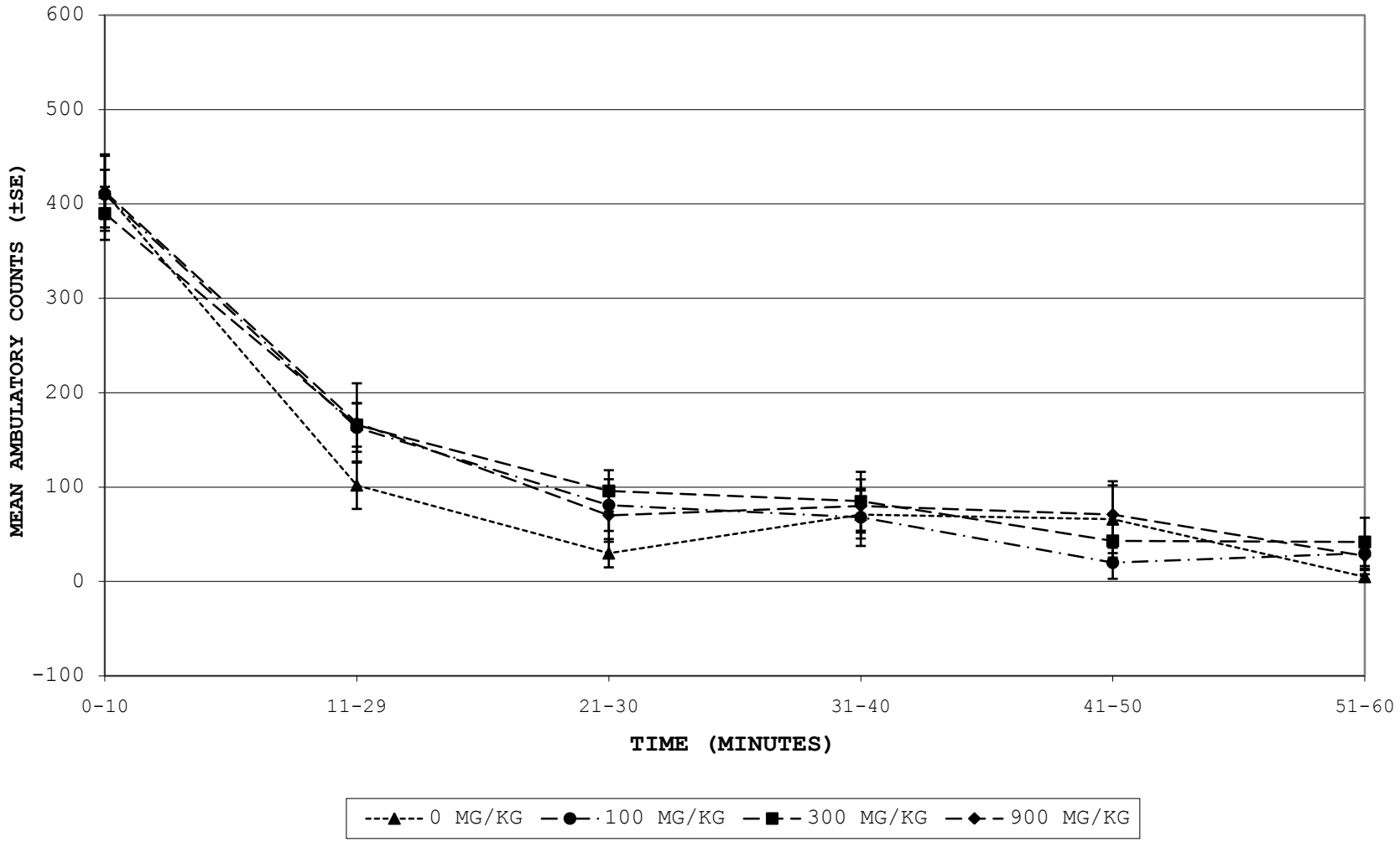
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 17 (F0 FEMALES)
SUMMARY OF MOTOR ACTIVITY AMBULATORY COUNTS BY SESSION



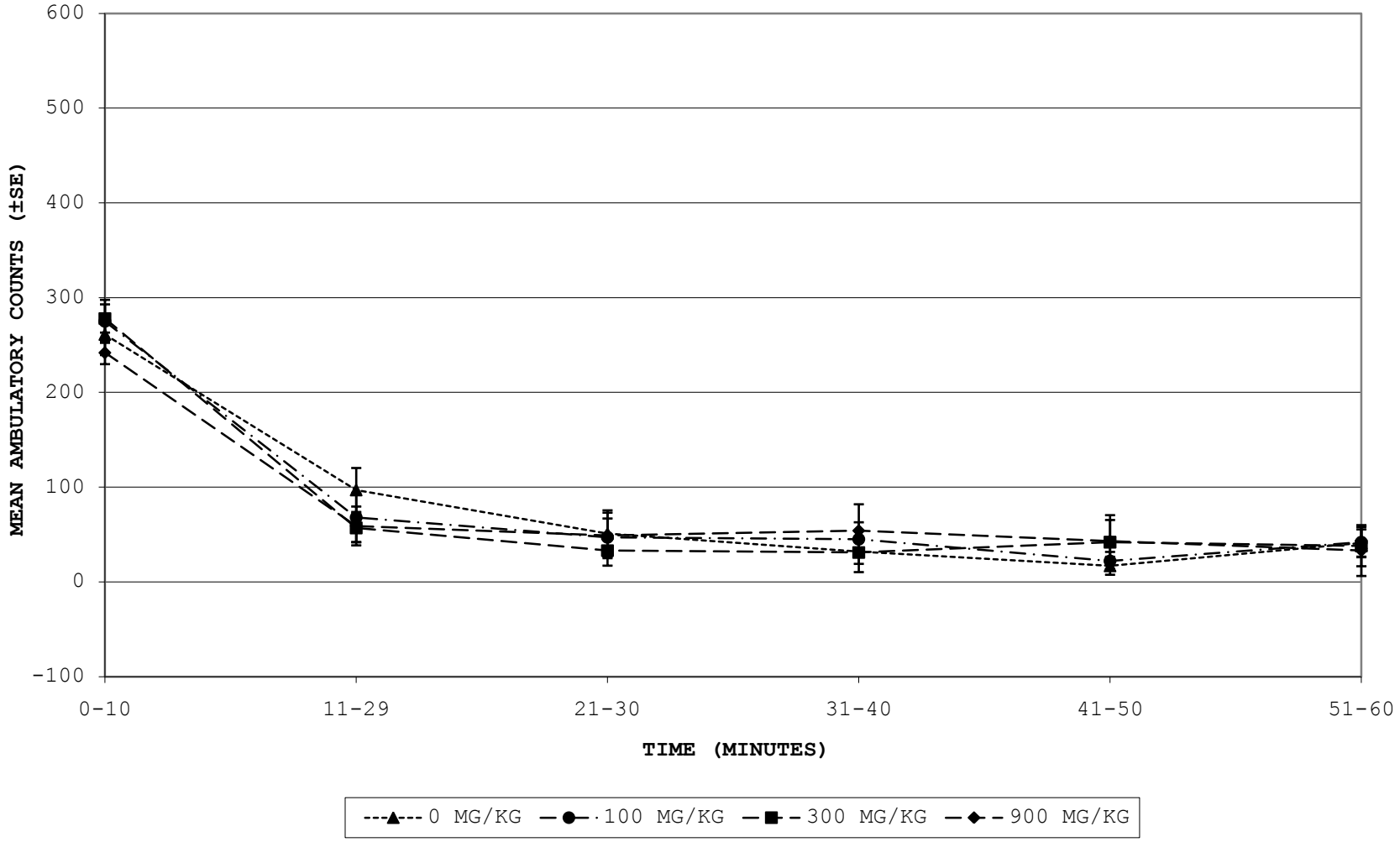
PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 18 (F0 FEMALES - PRETEST)
SUMMARY OF MOTOR ACTIVITY AMBULATORY COUNTS



PROJECT NO.:WIL-402011F
SPONSOR:AMERICAN PETROLEUM

FIGURE 19 (F0 FEMALES - LACTATION DAY 4)
SUMMARY OF MOTOR ACTIVITY AMBULATORY COUNTS



TABLES S1 - S74

TABLE S1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	09-16-10 TO 10-22-10					
GROUP:	1	2	3	4	5	6
NORMAL						
-NO SIGNIFICANT CLINICAL OBSERVATIONS	31/ 5	72/12	68/12	66/12	26/12	28/ 5
DISPOSITION						
-SCHEDULED EUTHANASIA	5/ 5	12/12	12/12	12/12	12/12	5/ 5
BODY/INTEGUMENT						
-HAIR LOSS RIGHT FORELIMB	4/ 1	8/ 3	9/ 2	4/ 2	16/ 4	1/ 1
-HAIR LOSS LEFT FORELIMB	1/ 1	7/ 2	9/ 2	5/ 2	16/ 4	4/ 1
-WET YELLOW MATERIAL UROGENITAL AREA	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0	2/ 2
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/ 0	2/ 1	2/ 1	2/ 2	35/10	0/ 0
-HAIR LOSS LEFT HINDLIMB	0/ 0	0/ 0	0/ 0	0/ 0	16/ 4	0/ 0
-HAIR LOSS VENTRAL THORACIC AREA	0/ 0	0/ 0	0/ 0	0/ 0	5/ 1	0/ 0
-HAIR LOSS VENTRAL ABDOMINAL AREA	0/ 0	0/ 0	3/ 1	3/ 1	17/ 8	0/ 0
-HAIR LOSS UROGENITAL AREA	0/ 0	0/ 0	0/ 0	7/ 4	42/12	0/ 0
-HAIR LOSS RIGHT HINDLIMB	0/ 0	0/ 0	0/ 0	2/ 1	3/ 2	0/ 0
-HAIR LOSS RUMP	0/ 0	0/ 0	0/ 0	0/ 0	3/ 1	0/ 0
-SCABBING RIGHT FORELIMB	0/ 0	0/ 0	1/ 1	2/ 1	5/ 2	0/ 0
-SCABBING LEFT FORELIMB	0/ 0	1/ 1	2/ 2	2/ 2	0/ 0	0/ 0
-DRIED YELLOW MATERIAL LEFT HINDLIMB	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
-HAIR LOSS RIGHT LATERAL ABDOMINAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0
-HAIR LOSS DORSAL NECK	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 2

SPONSOR:AMERICAN PETROLEUM SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	09-16-10 TO 10-22-10					
GROUP:	1	2	3	4	5	6
BODY/INTEGUMENT						
-HAIR LOSS DORSAL HEAD	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
-SCABBING DORSAL HEAD	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
-WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-WET YELLOW MATERIAL VENTRAL THORACIC AREA	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-LEFT TESTICLE UNDESCENDED	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
EYES/EARS/NOSE						
-DRIED RED MATERIAL AROUND NOSE	0/ 0	1/ 1	2/ 2	4/ 3	1/ 1	0/ 0
ORAL/DENTAL						
-DRIED CLEAR MATERIAL AROUND MOUTH	0/ 0	1/ 1	0/ 0	0/ 0	3/ 3	1/ 1
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-SCABBING AROUND MOUTH	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-SWOLLEN UPPER LIP	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	09-16-10 TO 11-15-10					
GROUP:	1	2	3	4	5	6
NORMAL						
-NO SIGNIFICANT CLINICAL OBSERVATIONS	41/ 5	87/12	69/11	79/12	32/11	37/ 5
DISPOSITION						
-SCHEDULED EUTHANASIA; LACTATION DAY 4	5/ 5	9/ 9	12/12	10/10	10/10	5/ 5
-SCHEDULED EUTHANASIA; TOTAL LITTER LOSS	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-SCHEDULED EUTHANASIA; POST-MATING DAY 25	0/ 0	3/ 3	0/ 0	0/ 0	0/ 0	0/ 0
-EUTHANIZED IN EXTREMIS	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-SCHEDULED EUTHANASIA; POST-COHABITATION DAY 25	0/ 0	0/ 0	0/ 0	2/ 2	0/ 0	0/ 0
BEHAVIOR/CNS						
-HUNCHED POSTURE	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
BODY/INTEGUMENT						
-HAIR LOSS RIGHT FORELIMB	0/ 0	2/ 1	21/ 5	8/ 3	14/ 2	3/ 2
-HAIR LOSS LEFT FORELIMB	0/ 0	1/ 1	22/ 7	8/ 3	14/ 2	3/ 2
-WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2	0/ 0
-WET YELLOW MATERIAL UROGENITAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2	0/ 0
-WET BROWN MATERIAL ANOGENITAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-HAIR LOSS RIGHT HINDLIMB	0/ 0	1/ 1	4/ 1	7/ 2	23/ 4	0/ 0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	09-16-10 TO 11-15-10					
GROUP:	1	2	3	4	5	6
BODY/INTEGUMENT						
-HAIR LOSS LEFT HINDLIMB	0/ 0	4/ 1	7/ 1	5/ 1	27/ 6	0/ 0
-HAIR LOSS VENTRAL ABDOMINAL AREA	0/ 0	1/ 1	4/ 1	12/ 4	44/10	0/ 0
-DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA	0/ 0	0/ 0	0/ 0	2/ 2	10/ 8	0/ 0
-DRIED YELLOW MATERIAL ANOGENITAL AREA	0/ 0	0/ 0	0/ 0	4/ 1	5/ 4	0/ 0
-HAIR LOSS VENTRAL THORACIC AREA	0/ 0	0/ 0	0/ 0	3/ 2	18/ 6	0/ 0
-DRIED YELLOW MATERIAL VENTRAL THORACIC AREA	0/ 0	0/ 0	0/ 0	0/ 0	8/ 6	0/ 0
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/ 0	0/ 0	0/ 0	4/ 3	19/ 6	0/ 0
-HAIR LOSS UROGENITAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0
-SCABBING LEFT HINDLIMB	0/ 0	1/ 1	0/ 0	0/ 0	1/ 1	0/ 0
-HAIR LOSS RIGHT LATERAL ABDOMINAL AREA	0/ 0	0/ 0	0/ 0	2/ 1	9/ 2	0/ 0
-HAIR LOSS LEFT LATERAL ABDOMINAL AREA	0/ 0	0/ 0	2/ 1	0/ 0	9/ 2	0/ 0
-HAIR LOSS DORSAL ABDOMINAL AREA	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0	0/ 0
-BODY COOL	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
CARDIO-PULMONARY						
-RALES	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
EYES/EARS/NOSE						
-EYELIDS SLIGHTLY DROOPING	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	09-16-10 TO 11-15-10					
GROUP:	1	2	3	4	5	6
EYES/EARS/NOSE						
-DRIED RED MATERIAL AROUND NOSE	1/ 1	2/ 2	4/ 4	3/ 3	7/ 7	0/ 0
-DRIED RED MATERIAL AROUND RIGHT EYE	0/ 0	0/ 0	0/ 0	1/ 1	1/ 1	0/ 0
ORAL/DENTAL						
-DRIED CLEAR MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2	0/ 0
-TEETH LONG; TRIMMED	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
SPECIAL II						
-BREEDING PERIOD COMPLETE; FEMALE SEPARATED FROM MALE AND PLACED INTO CLEAN CAGING	0/ 0	0/ 0	0/ 0	2/ 2	0/ 0	0/ 0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S3 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF POST-DOSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: 09-23-10 TO 10-21-10 GROUP:	1	2	3	4	5	6
NORMAL						
1 HOUR POST-DOSING						
-NO SIGNIFICANT CLINICAL OBSERVATIONS	0/0	338/12	308/12	272/12	69/12	0/0
BEHAVIOR/CNS						
1 HOUR POST-DOSING						
-HUNCHED POSTURE	0/0	0/0	0/0	0/0	28/6	0/0
BODY/INTEGUMENT						
1 HOUR POST-DOSING						
-WET YELLOW MATERIAL UROGENITAL AREA	0/0	0/0	0/0	11/6	97/11	0/0
-WET CLEAR MATERIAL RIGHT FORELIMB	0/0	0/0	1/1	5/4	14/8	0/0
-WET CLEAR MATERIAL LEFT FORELIMB	0/0	0/0	1/1	5/4	14/8	0/0
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/0	0/0	0/0	3/3	7/6	0/0
EYES/EARS/NOSE						
1 HOUR POST-DOSING						
-WET RED MATERIAL AROUND NOSE	0/0	0/0	1/1	0/0	2/2	0/0
-DRIED RED MATERIAL AROUND NOSE	0/0	1/1	1/1	0/0	2/2	0/0
-WET CLEAR MATERIAL AROUND NOSE	0/0	0/0	0/0	2/2	3/3	0/0
EXCRETA						
1 HOUR POST-DOSING						
-SOFT STOOL	0/0	0/0	0/0	0/0	3/2	0/0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S3 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF POST-DOSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: 09-23-10 TO 10-21-10 GROUP:	1	2	3	4	5	6
ORAL/DENTAL						
TIME OF DOSE						
-SALIVATION PRIOR TO DOSING	0/0	0/0	0/0	11/5	22/8	0/0
1 HOUR POST-DOSING						
-WET CLEAR MATERIAL AROUND MOUTH	0/0	1/1	6/4	11/6	84/12	0/0
-DRIED CLEAR MATERIAL AROUND MOUTH	0/0	2/1	26/8	46/12	155/12	0/0
-WET RED MATERIAL AROUND MOUTH	0/0	0/0	0/0	0/0	11/8	0/0
-DRIED RED MATERIAL AROUND MOUTH	0/0	0/0	3/2	2/2	18/6	0/0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S4 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF POST-DOSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: 09-23-10 TO 11-14-10 GROUP:	1	2	3	4	5	6
NORMAL						
1 HOUR POST-DOSING						
-NO SIGNIFICANT CLINICAL OBSERVATIONS	0/0	469/12	456/12	357/12	126/12	0/0
BEHAVIOR/CNS						
1 HOUR POST-DOSING						
-HYPOACTIVITY	0/0	0/0	0/0	0/0	5/4	0/0
-TREMORS	0/0	0/0	0/0	0/0	1/1	0/0
-ROCKS, LURCHES, OR SWAYS AS IT WALKS	0/0	0/0	0/0	0/0	24/9	0/0
-WALKS ON TIPTOES	0/0	0/0	0/0	0/0	15/10	0/0
-HUNCHED POSTURE	0/0	0/0	0/0	0/0	61/12	0/0
BODY/INTEGUMENT						
1 HOUR POST-DOSING						
-WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA	0/0	0/0	0/0	0/0	10/7	0/0
-WET YELLOW MATERIAL UROGENITAL AREA	0/0	0/0	0/0	15/4	38/12	0/0
-WET BROWN MATERIAL ANOGENITAL AREA	0/0	0/0	0/0	0/0	2/2	0/0
-WET CLEAR MATERIAL RIGHT FORELIMB	0/0	0/0	0/0	1/1	24/11	0/0
-WET CLEAR MATERIAL LEFT FORELIMB	0/0	0/0	0/0	1/1	23/11	0/0
-WET YELLOW MATERIAL ANOGENITAL AREA	0/0	2/2	0/0	3/2	3/3	0/0
-DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA	0/0	0/0	0/0	0/0	2/2	0/0
-DRIED YELLOW MATERIAL ANOGENITAL AREA	0/0	0/0	0/0	0/0	1/1	0/0
-WET CLEAR MATERIAL VENTRAL THORACIC AREA	0/0	0/0	0/0	1/1	1/1	0/0
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/0	0/0	0/0	2/2	2/1	0/0
-DRIED YELLOW MATERIAL LEFT HINDLIMB	0/0	0/0	0/0	0/0	1/1	0/0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

----- F E M A L E -----

TABLE RANGE: 09-23-10 TO 11-14-10 GROUP:	1	2	3	4	5	6
CARDIO-PULMONARY						
1 HOUR POST-DOSING						
-SHALLOW RESPIRATION	0/0	0/0	0/0	0/0	6/6	0/0
-RALES	0/0	0/0	0/0	0/0	1/1	0/0
EYES/EARS/NOSE						
1 HOUR POST-DOSING						
-WET RED MATERIAL AROUND NOSE	0/0	0/0	0/0	1/1	0/0	0/0
-WET CLEAR MATERIAL AROUND NOSE	0/0	0/0	1/1	5/3	11/8	0/0
-EYELIDS SLIGHTLY DROOPING	0/0	0/0	0/0	0/0	2/2	0/0
-LACRIMATION RIGHT EYE	0/0	0/0	0/0	0/0	5/3	0/0
-DRIED RED MATERIAL AROUND NOSE	0/0	0/0	1/1	1/1	2/2	0/0
-LACRIMATION LEFT EYE	0/0	0/0	0/0	0/0	2/2	0/0
EXCRETA						
1 HOUR POST-DOSING						
-DIARRHEA	0/0	1/1	0/0	0/0	3/3	0/0
-SOFT STOOL	0/0	0/0	0/0	0/0	1/1	0/0
ORAL/DENTAL						
TIME OF DOSE						
-SALIVATION PRIOR TO DOSING	0/0	9/3	0/0	38/12	89/11	0/0
-WET CLEAR MATERIAL AROUND MOUTH	0/0	0/0	0/0	0/0	1/1	0/0
1 HOUR POST-DOSING						
-WET CLEAR MATERIAL AROUND MOUTH	0/0	2/2	2/2	19/8	91/12	0/0
-DRIED CLEAR MATERIAL AROUND MOUTH	0/0	8/2	32/8	141/11	241/12	0/0
-DRIED RED MATERIAL AROUND MOUTH	0/0	0/0	4/4	20/9	63/11	0/0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S5 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHTS [G]

MALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7						
MEAN	367.	369.	372.	366.	367.	366.
S.D.	10.7	19.3	18.2	16.3	16.3	15.1
S.E.	4.8	5.6	5.3	4.7	4.7	6.7
N	5	12	12	12	12	5
DAY 0						
MEAN	395.	393.	392.	391.	386.	400.
S.D.	16.2	30.3	27.9	19.8	20.7	22.6
S.E.	7.2	8.7	8.0	5.7	6.0	10.1
N	5	12	12	12	12	5
DAY 7						
MEAN	413.	414.	413.	411.	389.	424.
S.D.	14.5	36.1	31.3	26.8	24.1	23.0
S.E.	6.5	10.4	9.0	7.7	7.0	10.3
N	5	12	12	12	12	5
DAY 13						
MEAN	433.	440.	434.	434.	408.	445.
S.D.	18.3	38.2	35.6	32.2	24.0	16.6
S.E.	8.2	11.0	10.3	9.3	6.9	7.4
N	5	12	12	12	12	5
DAY 20						
MEAN	448.	462.	457.	449.	426.	461.
S.D.	18.9	40.8	41.5	30.6	23.8	19.8
S.E.	8.4	11.8	12.0	8.8	6.9	8.9
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

MALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 27						
MEAN	472.	486.	478.	468.	446.	485.
S.D.	25.0	46.0	46.1	34.1	27.6	20.8
S.E.	11.2	13.3	13.3	9.8	8.0	9.3
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

PJTBWSUv5.18
01/07/2011
R:01/20/2011

TABLE S6 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHT CHANGES [G]

MALES

GROUP:		SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7- 0							
	MEAN	29.	25.	21.	25.	19.	34.
	S.D.	6.7	13.7	13.4	7.1	8.2	15.1
	S.E.	3.0	3.9	3.9	2.1	2.4	6.7
	N	5	12	12	12	12	5
DAY 0- 7							
	MEAN	18.	21.	20.	21.	3.d	24.
	S.D.	2.6	7.0	13.0	10.7	10.1	7.5
	S.E.	1.2	2.0	3.8	3.1	2.9	3.4
	N	5	12	12	12	12	5
DAY 7- 13							
	MEAN	19.	25.	22.	23.	19.	21.
	S.D.	7.3	7.3	7.7	6.5	6.1	10.3
	S.E.	3.2	2.1	2.2	1.9	1.8	4.6
	N	5	12	12	12	12	5
DAY 13- 20							
	MEAN	15.	22.b	23.	15.c	18.	16.
	S.D.	4.8	4.3	8.4	5.0	5.3	6.0
	S.E.	2.2	1.2	2.4	1.4	1.5	2.7
	N	5	12	12	12	12	5
DAY 20- 27							
	MEAN	24.	24.	20.	19.	19.	24.
	S.D.	7.9	7.4	6.0	6.6	6.5	12.1
	S.E.	3.5	2.2	1.7	1.9	1.9	5.4
	N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

TABLE S6 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHT CHANGES [G]

MALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 0- 13 (PRE-MATING PERIOD)						
MEAN	37.	46.	42.	43.	21.d	45.
S.D.	6.8	10.9	15.8	15.8	12.2	13.9
S.E.	3.0	3.1	4.6	4.6	3.5	6.2
N	5	12	12	12	12	5
DAY 0- 27 (ENTIRE TREATMENT PERIOD)						
MEAN	76.	92.	85.	77.	59.d	85.
S.D.	17.4	19.5	24.7	16.9	16.2	16.1
S.E.	7.8	5.6	7.1	4.9	4.7	7.2
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
d = Significantly different from control group 2 at 0.01 using Dunnett's test
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

PJTBWSUv5.18
01/07/2011
R:01/20/2011

TABLE S7 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHTS [G]

		FEMALES					
	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7							
	MEAN	233.	232.	234.	233.	230.	231.
	S.D.	10.5	11.3	13.2	10.3	12.9	10.2
	S.E.	4.7	3.3	3.8	3.0	3.7	4.5
	N	5	12	12	12	12	5
DAY 0							
	MEAN	246.	245.	244.	242.	241.	246.
	S.D.	14.4	12.4	15.1	15.2	13.9	15.0
	S.E.	6.5	3.6	4.4	4.4	4.0	6.7
	N	5	12	12	12	12	5
DAY 7							
	MEAN	255.	252.	246.	240.	241.	252.
	S.D.	19.4	15.2	19.3	15.7	10.9	14.7
	S.E.	8.7	4.4	5.6	4.5	3.1	6.6
	N	5	12	12	12	12	5
DAY 13							
	MEAN	267.	258.	252.	247.	248.	260.
	S.D.	20.0	18.0	21.1	17.1	13.2	18.5
	S.E.	9.0	5.2	6.1	4.9	3.8	8.3
	N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

PJTBWSUv5.18
12/16/2010
R:01/20/2011

TABLE S8 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHT CHANGES [G]

FEMALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7- 0						
MEAN	13.	13.	10.	9.	11.	15.
S.D.	4.7	6.1	6.8	6.7	9.6	7.5
S.E.	2.1	1.8	2.0	1.9	2.8	3.4
N	5	12	12	12	12	5
DAY 0- 7						
MEAN	9.	7.	2.	-2.	1.	5.
S.D.	9.1	6.7	6.9	8.6	10.1	4.3
S.E.	4.1	1.9	2.0	2.5	2.9	1.9
N	5	12	12	12	12	5
DAY 7- 13						
MEAN	12.	6.	6.	7.	7.	8.
S.D.	7.8	5.9	5.3	4.5	8.9	6.6
S.E.	3.5	1.7	1.5	1.3	2.6	2.9
N	5	12	12	12	12	5
DAY 0- 13 (PRE-MATING PERIOD)						
MEAN	21.	13.	8.	5.	7.	14.
S.D.	7.6	9.3	9.6	8.9	13.6	4.0
S.E.	3.4	2.7	2.8	2.6	3.9	1.8
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

PJTBWSUv5.18
12/16/2010
R:01/20/2011

TABLE S9 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHTS DURING GESTATION [G]

GROUP:		SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY	0						
	MEAN	269.	263.	252.	251.	249.	258.
	S.D.	24.8	21.7	18.6	19.0	14.5	21.3
	S.E.	11.1	7.2	5.4	6.0	4.2	9.5
	N	5	9	12	10	12	5
DAY	4						
	MEAN	286.	267.	265.	262.	264.	275.
	S.D.	26.0	20.8	22.4	21.4	18.1	21.9
	S.E.	11.6	6.9	6.5	6.8	5.2	9.8
	N	5	9	12	10	12	5
DAY	7						
	MEAN	303.	278.	276.	274.	277.	282.
	S.D.	30.4	23.4	22.6	20.1	21.7	24.6
	S.E.	13.6	7.8	6.5	6.3	6.3	11.0
	N	5	9	12	10	12	5
DAY	11						
	MEAN	322.	299.	296.	292.	294.	302.
	S.D.	32.5	25.1	23.1	19.9	20.9	21.2
	S.E.	14.5	8.4	6.7	6.3	6.0	9.5
	N	5	9	12	10	12	5
DAY	14						
	MEAN	336.	314.	305.	304.	307.	315.
	S.D.	28.3	25.2	23.8	23.8	25.5	20.0
	S.E.	12.7	8.4	6.9	7.5	7.4	9.0
	N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE S9 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHTS DURING GESTATION [G]

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 17						
MEAN	373.	349.	337.	332.	328.	340.
S.D.	33.0	27.1	26.6	25.0	26.8	20.3
S.E.	14.7	9.0	7.7	7.9	7.7	9.1
N	5	9	12	10	12	5
DAY 20						
MEAN	420.	393.	376.	367.	360.	379.
S.D.	33.5	30.9	29.0	28.0	32.9	21.5
S.E.	15.0	10.3	8.4	8.8	9.5	9.6
N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

PGBWSUv5.10
12/09/2010
R:01/20/2011

TABLE S10 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHT CHANGES DURING GESTATION [G]

GROUP:		SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 0- 4							
	MEAN	17.	5.a	13.	11.	15.c	17.
	S.D.	7.4	8.5	6.5	8.0	9.1	9.0
	S.E.	3.3	2.8	1.9	2.5	2.6	4.0
	N	5	9	12	10	12	5
DAY 4- 7							
	MEAN	17.	10.	11.	12.	14.	7.
	S.D.	10.2	7.3	5.2	5.2	10.9	12.4
	S.E.	4.6	2.4	1.5	1.7	3.2	5.5
	N	5	9	12	10	12	5
DAY 7- 11							
	MEAN	19.	21.	20.	18.	16.	20.
	S.D.	9.1	8.1	7.7	2.5	6.7	10.1
	S.E.	4.1	2.7	2.2	0.8	1.9	4.5
	N	5	9	12	10	12	5
DAY 11- 14							
	MEAN	14.	15.	10.	12.	13.	13.
	S.D.	5.9	10.3	6.1	5.8	6.0	6.3
	S.E.	2.6	3.4	1.8	1.8	1.7	2.8
	N	5	9	12	10	12	5
DAY 14- 17							
	MEAN	37.	35.	32.	28.	21.d	25.e
	S.D.	7.4	6.8	5.5	4.7	6.9	5.1
	S.E.	3.3	2.3	1.6	1.5	2.0	2.3
	N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
a = Significantly different from control group 1 at 0.05 using two-sample t-test
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
e = Significantly different from control group 1 at 0.05 using two-sample t-test
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 17- 20						
MEAN	48.	44.	39.	36.	32.d	39.
S.D.	3.5	6.3	7.8	6.4	10.0	8.0
S.E.	1.6	2.1	2.2	2.0	2.9	3.6
N	5	9	12	10	12	5
DAY 0- 20						
MEAN	151.	131.a	124.	116.	111.	122.e
S.D.	13.2	16.2	12.6	13.4	23.7	15.3
S.E.	5.9	5.4	3.7	4.2	6.8	6.9
N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
a = Significantly different from control group 1 at 0.05 using two-sample t-test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
e = Significantly different from control group 1 at 0.05 using two-sample t-test
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

PGBWSUv5.10
12/09/2010
R:01/20/2011

TABLE S11 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHTS DURING LACTATION [G]

GROUP:		SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY	1						
	MEAN	321.	304.	288.	292.	281.	295.
	S.D.	37.7	19.9	28.0	26.3	24.9	24.2
	S.E.	16.9	6.6	8.1	8.3	7.2	10.8
	N	5	9	12	10	12	5
DAY	4						
	MEAN	335.	313.	301.	293.	289.	295.
	S.D.	25.2	23.2	30.2	23.6	24.1	31.3
	S.E.	11.3	7.7	8.7	7.5	7.6	14.0
	N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

PLBWSUv5.08
12/09/2010
R:01/20/2011

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 1- 4						
MEAN	14.	9.	13.	1.	9.	0.
S.D.	15.0	11.3	6.4	8.9	10.7	9.7
S.E.	6.7	3.8	1.9	2.8	3.4	4.3
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

PLBWSUv5.08
12/09/2010
R:01/20/2011

TABLE S13 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION [G/ANIMAL/DAY]

MALES

GROUP:		SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7- 0							
	MEAN	26.	26.	26.	26.	26.	27.
	S.D.	1.7	3.5	3.3	2.0	2.1	2.3
	S.E.	0.8	1.0	1.0	0.6	0.6	1.0
	N	5	12	12	12	12	5
DAY 0- 7							
	MEAN	28.	20.b	20.	20.	15.d	30.
	S.D.	3.3	2.7	1.6	3.4	2.3	3.7
	S.E.	1.5	0.8	0.5	1.0	0.7	1.6
	N	5	12	12	12	11	5
DAY 7- 13							
	MEAN	29.	19.b	16.c	15.d	13.d	20.f
	S.D.	4.9	4.0	2.2	1.8	2.2	1.3
	S.E.	2.2	1.1	0.6	0.5	0.6	0.6
	N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
f = Significantly different from control group 1 at 0.01 using two-sample t-test

PJTFWSUv5.20
12/09/2010
R:01/20/2011

TABLE S14 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION [G/KG/DAY]

MALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7- 0						
MEAN	68.	67.	67.	67.	68.	70.
S.D.	2.9	5.3	6.4	3.2	4.4	5.9
S.E.	1.3	1.5	1.9	0.9	1.3	2.7
N	5	12	12	12	12	5
DAY 0- 7						
MEAN	70.	49.b	50.	49.	39.d	73.
S.D.	8.4	4.8	4.1	6.7	4.5	8.3
S.E.	3.8	1.4	1.2	1.9	1.3	3.7
N	5	12	12	12	11	5
DAY 7- 13						
MEAN	68.	44.b	37.c	36.d	32.d	47.f
S.D.	9.1	7.8	4.7	4.7	6.0	4.3
S.E.	4.0	2.2	1.4	1.4	1.7	1.9
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
f = Significantly different from control group 1 at 0.01 using two-sample t-test

PJTFWSUv5.20
12/09/2010
R:01/20/2011

TABLE S15 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7- 0						
MEAN	20.	19.	18.	19.	19.	19.
S.D.	2.3	2.2	1.8	3.2	2.8	1.5
S.E.	1.0	0.6	0.5	0.9	0.8	0.7
N	5	12	12	12	12	5
DAY 0- 7						
MEAN	23.	17.b	15.	13.d	12.d	22.
S.D.	1.8	2.5	3.3	1.7	4.0	2.0
S.E.	0.8	0.7	0.9	0.5	1.1	0.9
N	5	12	12	12	12	5
DAY 7- 13						
MEAN	20.	14.b	9.d	8.d	9.d	13.f
S.D.	1.9	2.3	3.0	2.9	4.8	1.8
S.E.	0.8	0.7	0.9	0.8	1.4	0.8
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
f = Significantly different from control group 1 at 0.01 using two-sample t-test

PJTFWSUv5.20
12/16/2010
R:01/20/2011

TABLE S16 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION [G/KG/DAY]

		FEMALES					
	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY -7- 0							
	MEAN	85.	81.	76.	78.	82.	80.
	S.D.	7.5	6.1	5.6	11.4	10.2	3.1
	S.E.	3.4	1.8	1.6	3.3	3.0	1.4
	N	5	12	12	12	12	5
DAY 0- 7							
	MEAN	90.	70.b	60.	55.d	52.d	88.
	S.D.	7.9	11.0	10.3	7.9	16.4	7.3
	S.E.	3.5	3.2	3.0	2.3	4.7	3.2
	N	5	12	12	12	12	5
DAY 7- 13							
	MEAN	75.	54.b	34.d	31.d	36.d	52.f
	S.D.	2.9	7.3	11.4	12.0	18.7	7.0
	S.E.	1.3	2.1	3.3	3.5	5.4	3.1
	N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
f = Significantly different from control group 1 at 0.01 using two-sample t-test

PJTFWSUv5.20
12/16/2010
R:01/20/2011

TABLE S17 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION DURING GESTATION [G/ANIMAL/DAY]

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 0- 4						
MEAN	20.	8.b	11.	10.	11.	18.
S.D.	2.1	4.9	2.6	1.8	3.5	1.5
S.E.	0.9	1.6	0.8	0.6	1.0	0.7
N	5	9	12	10	12	5
DAY 4- 7						
MEAN	22.	13.b	13.	13.	16.d	21.
S.D.	4.3	1.5	1.6	1.3	3.1	3.0
S.E.	1.9	0.5	0.5	0.4	0.9	1.3
N	5	9	12	10	11	5
DAY 7- 11						
MEAN	23.	13.b	14.	14.	15.	20.
S.D.	3.2	1.9	1.9	1.0	1.7	1.9
S.E.	1.4	0.6	0.6	0.3	0.5	0.9
N	5	9	12	10	11	5
DAY 11- 14						
MEAN	24.	14.b	14.	14.	17.	22.
S.D.	2.5	1.6	1.6	2.7	4.1	2.1
S.E.	1.1	0.5	0.5	0.8	1.2	0.9
N	5	9	12	10	11	5
DAY 14- 17						
MEAN	24.	17.b	16.	15.	19.	23.
S.D.	3.0	2.3	1.9	2.5	6.9	1.1
S.E.	1.4	0.8	0.5	0.8	2.0	0.5
N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE S17 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION DURING GESTATION [G/ANIMAL/DAY]

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 17- 20						
MEAN	25.	17.b	15.	15.	16.	22.
S.D.	3.1	2.4	2.7	2.8	3.5	1.8
S.E.	1.4	0.8	0.8	0.9	1.0	0.8
N	5	9	12	10	12	5
DAY 0- 20						
MEAN	23.	13.b	14.	13.	15.	21.
S.D.	2.8	2.1	1.5	1.8	3.0	1.6
S.E.	1.2	0.7	0.4	0.6	0.9	0.7
N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

PGFWSUv5.16
12/09/2010
R:01/20/2011

TABLE S18 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION DURING GESTATION [G/KG/DAY]

GROUP:		SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 0- 4							
	MEAN	70.	30.b	42.	38.	45.	69.
	S.D.	3.4	18.6	9.5	6.1	13.1	6.5
	S.E.	1.5	6.2	2.7	1.9	3.8	2.9
	N	5	9	12	10	12	5
DAY 4- 7							
	MEAN	76.	47.b	50.	49.	59.d	75.
	S.D.	9.9	3.8	5.4	3.9	12.3	11.1
	S.E.	4.4	1.3	1.6	1.2	3.7	5.0
	N	5	9	12	10	11	5
DAY 7- 11							
	MEAN	74.	44.b	47.	48.	51.d	70.
	S.D.	4.7	6.3	3.5	3.2	4.3	6.0
	S.E.	2.1	2.1	1.0	1.0	1.3	2.7
	N	5	9	12	10	11	5
DAY 11- 14							
	MEAN	73.	47.b	46.	48.	56.c	70.
	S.D.	4.4	4.0	3.8	6.3	11.2	6.9
	S.E.	2.0	1.3	1.1	2.0	3.4	3.1
	N	5	9	12	10	11	5
DAY 14- 17							
	MEAN	68.	50.b	49.	47.	60.	69.
	S.D.	4.8	5.6	3.6	5.2	24.6	6.1
	S.E.	2.2	1.9	1.1	1.6	7.1	2.7
	N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 17- 20						
MEAN	62.	46.b	43.	42.	47.	62.
S.D.	2.9	5.3	5.3	5.5	7.5	5.1
S.E.	1.3	1.8	1.5	1.7	2.2	2.3
N	5	9	12	10	12	5
DAY 0- 20						
MEAN	69.	43.b	45.	44.	52.d	68.
S.D.	4.0	6.3	2.9	3.6	9.6	5.1
S.E.	1.8	2.1	0.8	1.1	2.8	2.3
N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
b = Significantly different from control group 1 at 0.01 using two-sample t-test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NONGRAVID WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

PGFWSUv5.16
12/09/2010
R:01/20/2011

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 1- 4						
MEAN	31.	25.	26.	24.	17.	25.
S.D.	4.6	4.2	5.5	6.4	6.5	4.7
S.E.	2.1	1.6	1.7	2.1	2.9	2.1
N	5	7	11	9	5	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

PLFWSUv5.22
12/09/2010
R:01/20/2011

TABLE S20 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FOOD CONSUMPTION DURING LACTATION [G/KG/DAY]

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
DAY 1- 4						
MEAN	94.	83.	91.	82.	61.	84.
S.D.	15.9	10.8	20.2	22.7	20.6	9.5
S.E.	7.1	4.1	6.1	7.6	9.2	4.2
N	5	7	11	9	5	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

PLFWSUv5.22
12/09/2010
R:01/20/2011

TABLE S21 (F0 MALES - HOME CAGE OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

HOME CAGE OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
POSTURE						
SITTING OR STANDING NORMALLY	0	10	9	6	6	0
ASLEEP, LYING ON SIDE OR CURLED UP	0	1	3	4	6	0
ALERT, ORIENTED TOWARD OBSERVER	0	1	0	2	0	0
CONVULSIONS - CLONIC						
ABSENT	0	12	12	12	12	0
CONVULSIONS - TONIC						
ABSENT	0	12	12	12	12	0
TREMORS						
NONE	0	12	12	12	12	0
BITING						
NONE	0	12	12	12	12	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	9	9	6	5	0
EYELIDS SLIGHTLY DROOPING	0	0	1	0	1	0
DROOPING EYELIDS (HALF-CLOSED)	0	2	0	2	1	0
EYELIDS COMPLETELY SHUT	0	1	2	4	5	0
FECES CONSISTENCY						
PELLETS	0	5	4	4	7	0
PELLETS ABSENT	0	7	8	8	5	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/15/2010
R:01/10/2011

HOME CAGE OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
POSTURE						
SITTING OR STANDING NORMALLY	0	9	5	6	4	0
ASLEEP, LYING ON SIDE OR CURLED UP	0	2	7	4	6	0
ALERT, ORIENTED TOWARD OBSERVER	0	0	0	1	1	0
REARING	0	1	0	1	1	0
CONVULSIONS - CLONIC						
ABSENT	0	12	12	12	12	0
CONVULSIONS - TONIC						
ABSENT	0	12	12	12	12	0
TREMORS						
NONE	0	12	12	12	12	0
BITING						
NONE	0	12	12	12	12	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	10	5	8	6	0
DROOPING EYELIDS (HALF-CLOSED)	0	0	0	0	1	0
EYELIDS COMPLETELY SHUT	0	2	7	4	5	0
FECES CONSISTENCY						
PELLETS	0	1	1	1	1	0
PELLETS ABSENT	0	11	11	11	11	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/15/2010
R:01/10/2011

HOME CAGE OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
POSTURE						
SITTING OR STANDING NORMALLY	0	9	10	10	6	0
ASLEEP, LYING ON SIDE OR CURLED UP	0	1	2	0	5	0
ALERT, ORIENTED TOWARD OBSERVER	0	2	0	2	1	0
CONVULSIONS - CLONIC						
ABSENT	0	12	12	12	12	0
CONVULSIONS - TONIC						
ABSENT	0	12	12	12	12	0
TREMORS						
NONE	0	12	12	12	12	0
BITING						
NONE	0	12	12	12	12	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	11	9	12	8	0
EYELIDS SLIGHTLY DROOPING	0	0	1	0	0	0
DROOPING EYELIDS (HALF-CLOSED)	0	0	1	0	0	0
EYELIDS COMPLETELY SHUT	0	1	1	0	4	0
FECES CONSISTENCY						
PELLETS	0	6	5	7	8	0
PELLETS ABSENT	0	6	7	5	4	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/10/2010
R:01/10/2011

HOME CAGE OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	9	12	10	10	0
POSTURE						
SITTING OR STANDING NORMALLY	0	8	9	7	7	0
ASLEEP, LYING ON SIDE OR CURLED UP	0	1	2	1	3	0
ALERT, ORIENTED TOWARD OBSERVER	0	0	1	2	0	0
CONVULSIONS - CLONIC						
ABSENT	0	9	12	10	10	0
CONVULSIONS - TONIC						
ABSENT	0	9	12	10	10	0
TREMORS						
NONE	0	9	12	10	10	0
BITING						
NONE	0	9	12	10	10	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	8	8	9	8	0
EYELIDS SLIGHTLY DROOPING	0	0	2	1	0	0
DROOPING EYELIDS (HALF-CLOSED)	0	1	0	0	0	0
EYELIDS COMPLETELY SHUT	0	0	2	0	2	0
FECES CONSISTENCY						
PELLETS	0	4	4	8	5	0
PELLETS ABSENT	0	5	8	2	5	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

TABLE S25 (F0 MALES - HANDLING OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
EASE OF REMOVAL						
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	0	12	12	12	12	0
EASE OF HANDLING IN HAND						
NO RESISTANCE, ANIMAL IS EASY TO HANDLE	0	12	12	11	10	0
SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0	0	0	1	2	0
LACRIMATION						
NONE	0	12	12	12	12	0
CHROMODACRYORRHEA						
ABSENT	0	12	12	12	12	0
SALIVATION						
NONE	0	12	12	12	12	0
PILOERECTION						
NONE	0	12	12	12	12	0
FUR APPEARANCE						
NORMAL: CLEAN AND GROOMED	0	12	12	12	12	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	12	12	12	12	0
RESPIRATORY RATE						
NORMAL: BY OBSERVATION (80-110/MIN.)	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
RESPIRATORY CHARACTER						
NORMAL	0	12	12	12	12	0
RED DEPOSITS - eyes						
PRESENT	0	1	0	1	0	0
ABSENT	0	11	12	11	12	0
RED DEPOSITS - nose						
ABSENT	0	12	12	12	12	0
RED DEPOSITS - mouth						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - eyes						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - nose						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - mouth						
ABSENT	0	12	12	12	12	0
MUCOUS MEMBRANES - color						
PINK	0	12	12	12	12	0
EYES - color						
PINK	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
SKIN - color						
PINK	0	12	12	12	12	0
EYE PROMINENCE						
NORMAL	0	12	12	12	12	0
MUSCLE TONE						
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
01/17/2011
R:01/17/2011

TABLE S26 (F0 MALES - HANDLING OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — WEEK 4

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
EASE OF REMOVAL						
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	0	11	12	12	11	0
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	0	1	0	0	0	0
VERY DIFFICULT: TAIL AND THROAT RATTLES WITH/WITHOUT VOCALIZATION; MAY ATTACK	0	0	0	0	1	0
EASE OF HANDLING IN HAND						
NO RESISTANCE, ANIMAL IS EASY TO HANDLE	0	11	12	11	11	0
SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0	1	0	1	1	0
LACRIMATION						
NONE	0	12	12	12	12	0
CHROMODACRYORRHEA						
ABSENT	0	12	12	12	12	0
SALIVATION						
NONE	0	12	12	12	12	0
PILOERECTION						
NONE	0	12	12	12	12	0
FUR APPEARANCE						
NORMAL: CLEAN AND GROOMED	0	12	12	12	12	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
RESPIRATORY RATE						
NORMAL: BY OBSERVATION (80-110/MIN.)	0	12	12	12	12	0
RESPIRATORY CHARACTER						
NORMAL	0	12	12	12	12	0
RED DEPOSITS - eyes						
ABSENT	0	12	12	12	12	0
RED DEPOSITS - nose						
ABSENT	0	12	12	12	12	0
RED DEPOSITS - mouth						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - eyes						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - nose						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - mouth						
ABSENT	0	12	12	12	12	0
MUCOUS MEMBRANES - color						
PINK	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
EYES - color						
PINK	0	12	12	12	12	0
SKIN - color						
PINK	0	12	12	12	12	0
EYE PROMINENCE						
NORMAL	0	12	12	12	12	0
MUSCLE TONE						
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

TABLE S27 (F0 FEMALES - HANDLING OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
EASE OF REMOVAL						
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	0	12	11	11	11	0
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	0	0	1	1	1	0
EASE OF HANDLING IN HAND						
NO RESISTANCE, ANIMAL IS EASY TO HANDLE	0	12	12	12	12	0
LACRIMATION						
NONE	0	12	12	12	12	0
CHROMODACRYORRHEA						
ABSENT	0	12	12	12	12	0
SALIVATION						
NONE	0	12	12	12	12	0
PILOERECTION						
NONE	0	12	12	12	12	0
FUR APPEARANCE						
NORMAL: CLEAN AND GROOMED	0	12	12	12	12	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	12	12	12	12	0
RESPIRATORY RATE						
NORMAL: BY OBSERVATION (80-110/MIN.)	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
RESPIRATORY CHARACTER						
NORMAL	0	12	12	12	12	0
RED DEPOSITS - eyes						
ABSENT	0	12	12	12	12	0
RED DEPOSITS - nose						
ABSENT	0	12	12	12	12	0
RED DEPOSITS - mouth						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - eyes						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - nose						
ABSENT	0	12	12	12	12	0
CRUSTY DEPOSITS - mouth						
ABSENT	0	12	12	12	12	0
MUCOUS MEMBRANES - color						
PINK	0	12	12	12	12	0
EYES - color						
PINK	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
SKIN - color						
PINK	0	12	12	12	12	0
EYE PROMINENCE						
NORMAL	0	12	12	12	12	0
MUSCLE TONE						
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S28 (F0 FEMALES - HANDLING OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 4

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	9	12	10	10	0
EASE OF REMOVAL						
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	0	8	9	10	9	0
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	0	1	3	0	1	0
EASE OF HANDLING IN HAND						
NO RESISTANCE, ANIMAL IS EASY TO HANDLE	0	7	12	9	10	0
SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0	2	0	1	0	0
LACRIMATION						
NONE	0	9	12	10	10	0
CHROMODACRYORRHEA						
ABSENT	0	9	12	10	10	0
SALIVATION						
NONE	0	8	12	10	10	0
SEVERE	0	1	0	0	0	0
PILOERECTION						
NONE	0	9	12	10	10	0
FUR APPEARANCE						
NORMAL: CLEAN AND GROOMED	0	9	12	10	10	0
PALPEBRAL CLOSURE						
EYELIDS WIDE OPEN	0	9	12	10	10	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	9	12	10	10	0
RESPIRATORY RATE						
NORMAL: BY OBSERVATION (80-110/MIN.)	0	9	12	10	10	0
RESPIRATORY CHARACTER						
NORMAL	0	9	12	10	10	0
RED DEPOSITS - eyes						
ABSENT	0	9	12	10	10	0
RED DEPOSITS - nose						
PRESENT	0	0	0	1	0	0
ABSENT	0	9	12	9	10	0
RED DEPOSITS - mouth						
ABSENT	0	9	12	10	10	0
CRUSTY DEPOSITS - eyes						
ABSENT	0	9	12	10	10	0
CRUSTY DEPOSITS - nose						
PRESENT	0	0	0	1	0	0
ABSENT	0	9	12	9	10	0
CRUSTY DEPOSITS - mouth						
ABSENT	0	9	12	10	10	0
MUCOUS MEMBRANES - color						
PINK	0	9	12	10	10	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	9	12	10	10	0
EYES - color						
PINK	0	9	12	10	10	0
SKIN - color						
PINK	0	9	12	10	10	0
EYE PROMINENCE						
NORMAL	0	9	12	10	10	0
MUSCLE TONE						
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	0	9	12	10	10	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

TABLE S29 (F0 MALES - OPEN FIELD OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
TIME TO FIRST STEP (seconds)	: MEAN	0.0	0.5	0.4	0.4	0.4	0.0
	S.D.	0.00	0.25	0.15	0.08	0.14	0.00
MOBILITY							
NORMAL		0	12	12	12	12	0
GAIT							
NORMAL		0	12	12	12	12	0
CONVULSIONS - CLONIC							
ABSENT		0	12	12	12	12	0
CONVULSIONS - TONIC							
ABSENT		0	12	12	12	12	0
TREMORS							
NONE		0	12	12	12	12	0
GAIT SCORE							
NORMAL		0	12	12	12	12	0
AROUSAL							
VERY LOW: STUPOR, COMA, LITTLE OR NO RESPONSIVENESS		0	2	0	1	0	0
LOW: SOMEWHAT STUPOROUS		0	0	1	1	0	0
NORMAL: ALERT, EXPLORATORY MOVEMENTS		0	10	11	10	12	0
BIZARRE/STEREOTYPIC BEHAVIOR							
NONE		0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

None significantly different from control group 2 using Dunnett's test

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
REARING	: MEAN	0.0	3.4	5.1	5.3	3.3	0.0
	S.D.	0.00	2.68	2.94	2.53	1.48	0.00
BACKING	: MEAN	0.0	0.0	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.0	0.2	0.4	0.3	0.4	0.0
	S.D.	0.00	0.39	0.67	0.62	0.51	0.00
URINATION	: MEAN	0.0	0.3	0.4	0.3	0.7	0.0
	S.D.	0.00	0.62	0.90	0.49	0.78	0.00
DEFECATION	: MEAN	0.0	0.3	0.7	0.2	0.8	0.0
	S.D.	0.00	0.45	0.98	0.39	0.83	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S30 (F0 MALES - OPEN FIELD OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — WEEK 4

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
TIME TO FIRST STEP (seconds)	: MEAN	0.0	0.6	0.6	0.6	0.4	0.0
	S.D.	0.00	0.20	0.22	0.27	0.12	0.00
MOBILITY							
NORMAL		0	12	12	12	12	0
GAIT							
NORMAL		0	12	12	12	12	0
CONVULSIONS - CLONIC							
ABSENT		0	12	12	12	12	0
CONVULSIONS - TONIC							
ABSENT		0	12	12	12	12	0
TREMORS							
NONE		0	12	12	12	12	0
GAIT SCORE							
NORMAL		0	12	12	12	12	0
AROUSAL							
NORMAL: ALERT, EXPLORATORY MOVEMENTS		0	12	12	12	12	0
BIZARRE/STEREOTYPIC BEHAVIOR							
NONE		0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

None significantly different from control group 2 using Dunnett's test

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
REARING	: MEAN	0.0	4.3	3.5	5.3	5.8	0.0
	S.D.	0.00	2.34	2.75	4.79	2.80	0.00
BACKING	: MEAN	0.0	0.0	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.0	0.4	0.2	0.1	0.2	0.0
	S.D.	0.00	0.67	0.39	0.29	0.39	0.00
URINATION	: MEAN	0.0	0.3	0.4	0.3	0.3	0.0
	S.D.	0.00	0.49	0.51	0.49	0.49	0.00
DEFECATION	: MEAN	0.0	0.1	0.0	0.3	0.6	0.0
	S.D.	0.00	0.29	0.00	0.78	1.44	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S31 (F0 FEMALES - OPEN FIELD OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
TIME TO FIRST STEP (seconds)	: MEAN	0.0	0.6	0.6	0.5	0.6	0.0
	S.D.	0.00	0.20	0.18	0.12	0.17	0.00
MOBILITY							
NORMAL		0	12	12	12	12	0
GAIT							
NORMAL		0	12	12	12	12	0
CONVULSIONS - CLONIC							
ABSENT		0	12	12	12	12	0
CONVULSIONS - TONIC							
ABSENT		0	12	12	12	12	0
TREMORS							
NONE		0	12	12	12	12	0
GAIT SCORE							
NORMAL		0	12	12	12	12	0
AROUSAL							
NORMAL: ALERT, EXPLORATORY MOVEMENTS		0	12	12	12	12	0
BIZARRE/STEREOTYPIC BEHAVIOR							
NONE		0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

None significantly different from control group 2 using Dunnett's test

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
REARING	: MEAN	0.0	6.5	6.8	7.3	7.6	0.0
	S.D.	0.00	2.88	3.49	3.02	3.92	0.00
BACKING	: MEAN	0.0	0.3	0.0	0.2	0.0	0.0
	S.D.	0.00	0.62	0.00	0.58	0.00	0.00
GROOMING	: MEAN	0.0	1.4	2.0	1.3	1.3	0.0
	S.D.	0.00	0.79	1.41	1.44	0.89	0.00
URINATION	: MEAN	0.0	0.4	0.4	0.3	0.3	0.0
	S.D.	0.00	0.51	0.51	0.45	0.49	0.00
DEFECATION	: MEAN	0.0	0.0	0.2	0.1	0.1	0.0
	S.D.	0.00	0.00	0.39	0.29	0.29	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S32 (F0 FEMALES - OPEN FIELD OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 4

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	9	12	10	10	0
TIME TO FIRST STEP (seconds)	: MEAN	0.0	0.6	0.5	0.5	0.6	0.0
	S.D.	0.00	0.19	0.13	0.16	0.19	0.00
MOBILITY							
NORMAL		0	9	12	10	10	0
GAIT							
NORMAL		0	9	12	10	10	0
CONVULSIONS - CLONIC							
ABSENT		0	9	12	10	10	0
CONVULSIONS - TONIC							
ABSENT		0	9	12	10	10	0
TREMORS							
NONE		0	9	12	10	10	0
GAIT SCORE							
NORMAL		0	9	12	10	10	0
AROUSAL							
NORMAL: ALERT, EXPLORATORY MOVEMENTS		0	9	12	10	10	0
BIZARRE/STEREOTYPIC BEHAVIOR							
NONE		0	9	12	10	10	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test
None significantly different from control group 2 using Dunnett's test

TABLE S32 (F0 FEMALES - OPEN FIELD OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 2

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 4

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	9	12	10	10	0
REARING	: MEAN	0.0	4.8	4.5	8.4	7.1	0.0
	S.D.	0.00	2.68	3.83	7.06	5.07	0.00
BACKING	: MEAN	0.0	0.0	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.0	0.4	0.4	0.5	0.2	0.0
	S.D.	0.00	0.88	0.67	1.27	0.63	0.00
URINATION	: MEAN	0.0	0.8	0.4	0.3	0.7	0.0
	S.D.	0.00	0.83	0.51	0.48	0.95	0.00
DEFECATION	: MEAN	0.0	0.6	0.5	0.6	0.3	0.0
	S.D.	0.00	1.13	1.00	1.26	0.67	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S33 (F0 MALES - SENSORY OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

SENSORY OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
APPROACH RESPONSE						
SLOW APPROACH, SNIFFING OR TURNING AWAY	0	12	12	11	11	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	0	0	1	1	0
TOUCH RESPONSE						
NO REACTION	0	0	0	0	1	0
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	11	12	11	10	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	1	0	1	1	0
STARTLE RESPONSE						
NO REACTION	0	1	1	2	0	0
SLIGHT REACTION, EAR FLICK OR SOME EVIDENCE THAT SNAP WAS HEARD	0	11	10	9	10	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	0	1	1	2	0
TAIL PINCH RESPONSE						
NO REACTION	0	1	2	0	1	0
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	10	7	10	8	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	1	3	2	3	0
OLFACTORY ORIENTATION						
REACTION PRESENT: ANIMAL APPROACHES SWAB MAKING SNIFFING MOVEMENTS WITH NOSE	0	12	12	12	12	0
PUPIL RESPONSE						
PUPIL RESPONSE PRESENT	0	12	12	12	12	0
EYEBLINK RESPONSE						
EYEBLINK RESPONSE PRESENT	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

SENSORY OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
FORELIMB EXTENSION						
FORELIMB EXTENSION PRESENT	0	12	12	12	12	0
HINDLIMB EXTENSION						
HINDLIMB EXTENSION PRESENT	0	12	12	12	12	0
AIR RIGHTING REFLEX						
NORMAL	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S34 (F0 MALES - SENSORY OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA WEEK 4

SENSORY OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
APPROACH RESPONSE						
SLOW APPROACH, SNIFFING OR TURNING AWAY	0	12	12	12	12	0
TOUCH RESPONSE						
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	12	12	12	12	0
STARTLE RESPONSE						
SLIGHT REACTION, EAR FLICK OR SOME EVIDENCE THAT SNAP WAS HEARD	0	12	12	12	12	0
TAIL PINCH RESPONSE						
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	12	12	12	12	0
OLFACTORY ORIENTATION						
REACTION PRESENT: ANIMAL APPROACHES SWAB MAKING SNIFFING MOVEMENTS WITH NOSE	0	12	12	12	12	0
PUPIL RESPONSE						
PUPIL RESPONSE PRESENT	0	12	12	12	12	0
EYEBLINK RESPONSE						
EYEBLINK RESPONSE PRESENT	0	12	12	12	12	0
FORELIMB EXTENSION						
FORELIMB EXTENSION PRESENT	0	12	12	12	12	0
HINDLIMB EXTENSION						
HINDLIMB EXTENSION PRESENT	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

SENSORY OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
AIR Rrighting REFLEX						
NORMAL	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/29/2010
R:01/10/2011

TABLE S35 (F0 FEMALES - SENSORY OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

SENSORY OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
APPROACH RESPONSE						
NO REACTION	0	0	1	0	0	0
SLOW APPROACH, SNIFFING OR TURNING AWAY	0	12	11	12	12	0
TOUCH RESPONSE						
NO REACTION	0	0	1	0	0	0
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	12	11	12	12	0
STARTLE RESPONSE						
NO REACTION	0	0	1	0	0	0
SLIGHT REACTION, EAR FLICK OR SOME EVIDENCE THAT SNAP WAS HEARD	0	12	11	12	12	0
TAIL PINCH RESPONSE						
NO REACTION	0	0	1	0	1	0
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	12	11	12	11	0
OLFACTORY ORIENTATION						
REACTION PRESENT: ANIMAL APPROACHES SWAB MAKING SNIFFING MOVEMENTS WITH NOSE	0	12	12	12	12	0
PUPIL RESPONSE						
PUPIL RESPONSE PRESENT	0	12	12	12	12	0
EYEBLINK RESPONSE						
EYEBLINK RESPONSE PRESENT	0	12	12	12	12	0
FORELIMB EXTENSION						
FORELIMB EXTENSION PRESENT	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

SENSORY OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	12	12	12	12	0
HINDLIMB EXTENSION						
HINDLIMB EXTENSION PRESENT	0	12	12	12	12	0
AIR RIGHTING REFLEX						
NORMAL	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S36 (F0 FEMALES - SENSORY OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 4

SENSORY OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	9	12	10	10	0
APPROACH RESPONSE						
NO REACTION	0	0	1	0	1	0
SLOW APPROACH, SNIFFING OR TURNING AWAY	0	8	11	10	9	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	1	0	0	0	0
TOUCH RESPONSE						
NO REACTION	0	0	1	0	0	0
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	8	11	10	10	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	1	0	0	0	0
STARTLE RESPONSE						
SLIGHT REACTION, EAR FLICK OR SOME EVIDENCE THAT SNAP WAS HEARD	0	8	12	10	10	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	1	0	0	0	0
TAIL PINCH RESPONSE						
ANIMAL MAY SLOWLY TURN, WALK AWAY	0	9	10	8	9	0
MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	0	0	2	2	1	0
OLFACTORY ORIENTATION						
REACTION PRESENT: ANIMAL APPROACHES SWAB MAKING SNIFFING MOVEMENTS WITH NOSE	0	9	12	10	10	0
PUPIL RESPONSE						
PUPIL RESPONSE PRESENT	0	9	12	10	10	0
EYEBLINK RESPONSE						
EYEBLINK RESPONSE PRESENT	0	9	12	10	10	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

SENSORY OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4	5	6
NUMBER TESTED:	0	9	12	10	10	0
FORELIMB EXTENSION						
FORELIMB EXTENSION PRESENT	0	9	12	10	10	0
HINDLIMB EXTENSION						
HINDLIMB EXTENSION PRESENT	0	9	12	10	10	0
AIR RIGHTING REFLEX						
NORMAL	0	9	12	10	10	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
COMPLETE SCORING CRITERIA PRESENTED AS AN APPENDIX
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S37 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

NEUROMUSCULAR OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:			1	2	3	4	5	6
NUMBER TESTED:			0	12	12	12	12	0
HINDLIMB EXTENSOR STRENGTH								
HINDLIMB RESISTANCE PRESENT			0	12	12	12	12	0
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE:	MEAN	0.0	788.9	792.9	784.2	852.8	0.0
		S.D.	0.00	250.50	269.59	324.06	219.74	0.00
	HIND:	MEAN	0.0	343.2	315.2	350.8	296.7	0.0
		S.D.	0.00	101.80	79.55	80.50	75.96	0.00
ROTAROD PERFORMANCE (seconds)	:	MEAN	0.0	72.8	55.7	85.0	49.9	0.0
		S.D.	0.00	48.73	49.35	44.11	48.00	0.00
HINDLIMB FOOTSPLAY (mm)	:	MEAN	0.0	76.5	68.0	74.4	80.0	0.0
		S.D.	0.00	16.14	11.99	16.17	14.60	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test
None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
01/17/2011
R:01/17/2011

TABLE S38 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — WEEK 4

NEUROMUSCULAR OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:			1	2	3	4	5	6
NUMBER TESTED:			0	12	12	12	12	0
HINDLIMB EXTENSOR STRENGTH								
HINDLIMB RESISTANCE PRESENT			0	12	12	12	12	0
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE:	MEAN	0.0	620.0	503.3	597.3	635.4	0.0
		S.D.	0.00	324.01	236.96	287.73	315.05	0.00
	HIND:	MEAN	0.0	360.1	336.2	362.5	337.5	0.0
		S.D.	0.00	128.14	146.78	138.34	65.02	0.00
ROTAROD PERFORMANCE (seconds)	:	MEAN	0.0	47.1	34.7	47.8	44.1	0.0
		S.D.	0.00	48.07	27.51	30.98	50.07	0.00
HINDLIMB FOOTSPLAY (mm)	:	MEAN	0.0	68.1	65.2	72.5	82.3	0.0
		S.D.	0.00	19.96	13.78	13.17	11.03	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Fisher's Exact test

None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

NEUROMUSCULAR OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
HINDLIMB EXTENSOR STRENGTH HINDLIMB RESISTANCE PRESENT		0	12	12	12	12	0
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE: MEAN	0.0	802.7	736.3	753.3	729.8	0.0
	S.D.	0.00	101.82	158.74	145.47	196.24	0.00
	HIND: MEAN	0.0	415.6	404.3	389.7	387.3	0.0
	S.D.	0.00	81.55	61.94	91.33	91.97	0.00
ROTAROD PERFORMANCE (seconds)	: MEAN	0.0	48.1	55.4	86.6	62.9	0.0
	S.D.	0.00	45.34	44.78	45.11	51.37	0.00
HINDLIMB FOOTSPLAY (mm)	: MEAN	0.0	64.2	51.8	52.3	62.6	0.0
	S.D.	0.00	23.08	22.56	24.70	20.47	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group 2 using Fisher's Exact test
None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S40 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 4

NEUROMUSCULAR OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:			1	2	3	4	5	6
NUMBER TESTED:			0	9	12	10	10	0
HINDLIMB EXTENSOR STRENGTH								
HINDLIMB RESISTANCE PRESENT			0	9	12	10	10	0
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE:	MEAN	0.0	884.7	878.9	950.3	863.0	0.0
		S.D.	0.00	320.56	340.06	199.03	309.85	0.00
	HIND:	MEAN	0.0	425.1	386.3	442.9	408.5	0.0
		S.D.	0.00	138.63	89.49	139.77	182.05	0.00
ROTAROD PERFORMANCE (seconds)	:	MEAN	0.0	49.9	76.8	75.7	70.1	0.0
		S.D.	0.00	44.00	45.92	47.33	52.43	0.00
HINDLIMB FOOTSPLAY (mm)	:	MEAN	0.0	45.4	48.8	50.8	58.6	0.0
		S.D.	0.00	19.62	21.32	23.16	19.49	0.00

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test
None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
03/14/2011
R:03/14/2011

TABLE S41 (F0 MALES - PHYSIOLOGICAL OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

PHYSIOLOGICAL OBSERVATIONS
MALES

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
CATALEPSY (seconds)	: MEAN	0.0	0.6	0.4	0.4	0.5	0.0
	S.D.	0.00	0.14	0.11	0.11	0.18	0.00
	N	0	12	12	12	12	0
BODY TEMPERATURE (degrees C)	: MEAN	0.0	37.3	37.0	37.0	36.9	0.0
	S.D.	0.00	0.97	0.87	0.89	1.02	0.00
	N	0	12	12	12	12	0
BODY WEIGHT (g)	: MEAN	0.0	361.2	363.5	359.0	360.7	0.0
	S.D.	0.00	19.94	19.21	17.65	17.57	0.00
	N	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S42 (F0 MALES - PHYSIOLOGICAL OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — WEEK 4

PHYSIOLOGICAL OBSERVATIONS
MALES

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
CATALEPSY (seconds)	: MEAN	0.0	0.5	1.7	0.6	0.6	0.0
	S.D.	0.00	0.22	4.32	0.62	0.29	0.00
	N	0	12	12	12	12	0
BODY TEMPERATURE (degrees C)	: MEAN	0.0	37.9	37.9	37.7	37.9	0.0
	S.D.	0.00	0.78	0.49	0.58	0.71	0.00
	N	0	12	12	12	12	0
BODY WEIGHT (g)	: MEAN	0.0	461.5	453.4	443.7	416.9c	0.0
	S.D.	0.00	45.64	43.50	34.13	28.27	0.00
	N	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S43 (F0 FEMALES - PHYSIOLOGICAL OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

PHYSIOLOGICAL OBSERVATIONS
FEMALES

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	12	12	12	12	0
CATALEPSY (seconds)	: MEAN	0.0	0.7	0.6	0.6	0.6	0.0
	S.D.	0.00	0.25	0.16	0.16	0.26	0.00
	N	0	12	12	12	12	0
BODY TEMPERATURE (degrees C)	: MEAN	0.0	38.6	38.6	38.7	38.4	0.0
	S.D.	0.00	0.55	0.39	0.46	0.38	0.00
	N	0	12	12	12	12	0
BODY WEIGHT (g)	: MEAN	0.0	234.4	235.8	237.5	235.1	0.0
	S.D.	0.00	11.83	16.72	13.96	15.39	0.00
	N	0	12	12	12	12	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4 and 5.

None significantly different from control group 2 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S44 (F0 FEMALES - PHYSIOLOGICAL OBSERVATIONS - LACTATION DAY 4)

ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS
FEMALES

GROUP:		1	2	3	4	5	6
NUMBER TESTED:		0	9	12	10	10	0
CATALEPSY (seconds)	: MEAN	0.0	0.7	0.6	0.6	0.5	0.0
	S.D.	0.00	0.25	0.20	0.44	0.21	0.00
	N	0	9	12	10	10	0
BODY TEMPERATURE (degrees C)	: MEAN	0.0	38.7	38.8	39.2c	39.0	0.0
	S.D.	0.00	0.42	0.32	0.46	0.30	0.00
	N	0	9	12	10	10	0
BODY WEIGHT (g)	: MEAN	0.0	309.5	296.8	288.3	286.0	0.0
	S.D.	0.00	22.55	28.32	23.78	27.44	0.00
	N	0	9	12	10	10	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test

PFOBSUv4.36
12/10/2010
R:01/10/2011

TABLE S45 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MOTOR ACTIVITY COUNTS

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	TOTAL	0-10	Mean	1355	1318	1367	1370	
				% Difference Control	NA	-2.7	0.9	1.1	
				S.D.	312.6	192.0	200.7	254.8	
				S.E.	90.2	55.4	57.9	73.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	747	787	676	751	
				% Difference Control	NA	5.4	-9.5	0.5	
				S.D.	201.3	211.6	290.5	229.9	
				S.E.	58.1	61.1	83.9	66.4	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	345	452	353	448	
				% Difference Control	NA	31.0	2.3	29.9	
				S.D.	229.7	250.4	291.3	275.4	
				S.E.	66.3	72.3	84.1	79.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	258	251	122	225	
				S.D.	340.7	261.6	237.4	311.6	
				S.E.	98.4	75.5	68.5	90.0	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.

* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	TOTAL	41-50	Mean	141	189	37	104	
				S.D.	248.6	223.6	42.6	171.9	
				S.E.	71.8	64.5	12.3	49.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	33	122	71	69	
				S.D.	36.1	199.7	112.0	97.9	
				S.E.	10.4	57.7	32.3	28.3	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	2878	3119	2626	2968	
				% Difference Control	NA	8.4	-8.8	3.1	
				S.D.	902.6	815.3	795.2	894.8	
				S.E.	260.6	235.4	229.6	258.3	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.842	
				Trt F-test p-value++					0.564
				Trt*Time p-value++					0.794
				LinTrt*Time p-value#					0.542
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	AMBULATORY	0-10	Mean	309	339	341	318	
				% Difference Control	NA	9.7	10.4	2.9	
				S.D.	83.6	82.4	90.9	77.1	
				S.E.	24.1	23.8	26.2	22.3	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	116	139	121	113	
				% Difference Control	NA	19.8	4.3	-2.6	
				S.D.	61.8	53.7	72.2	71.3	
				S.E.	17.8	15.5	20.8	20.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	40	62	57	74	
				% Difference Control	NA	55.0	42.5	85.0	
				S.D.	59.2	51.0	63.1	67.5	
				S.E.	17.1	14.7	18.2	19.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	51	39	17	32	
				S.D.	89.4	57.3	46.8	65.8	
				S.E.	25.8	16.5	13.5	19.0	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	AMBULATORY	41-50	Mean	17	23	2	8	
				S.D.	39.1	34.3	3.1	19.3	
				S.E.	11.3	9.9	0.9	5.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	0	16	11	10	
				S.D.	0.6	32.7	26.1	25.8	
				S.E.	0.2	9.4	7.5	7.4	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	532	617	548	556	
				% Difference Control	NA	16.0	3.0	4.5	
				S.D.	221.2	172.3	192.0	185.8	
				S.E.	63.8	49.7	55.4	53.6	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.995	
				Trt F-test p-value++					0.726
				Trt*Time p-value++					0.742
				LinTrt*Time p-value#					0.167
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	TOTAL	0-10	Mean	1294	1184	1162	1226	
				% Difference Control	NA	-8.5	-10.2	-5.3	
				S.D.	224.9	206.8	196.2	121.9	
				S.E.	64.9	59.7	56.6	35.2	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	677	637	492	676	
				% Difference Control	NA	-5.9	-27.3	-0.1	
				S.D.	241.2	161.0	170.0	141.8	
				S.E.	69.6	46.5	49.1	40.9	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	478	347	334	418	
				% Difference Control	NA	-27.4	-30.1	-12.6	
				S.D.	349.5	222.7	242.5	274.1	
				S.E.	100.9	64.3	70.0	79.1	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	401	226	158	343	
				S.D.	292.1	217.3	169.6	301.8	
				S.E.	84.3	62.7	49.0	87.1	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	TOTAL	41-50	Mean	189	213	207	234	
				S.D.	265.0	176.3	205.1	230.3	
				S.E.	76.5	50.9	59.2	66.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	197	232	104	236	
				S.D.	207.4	235.6	145.8	289.1	
				S.E.	59.9	68.0	42.1	83.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	3234	2839	2458	3133	
				% Difference Control	NA	-12.2	-24.0	-3.1	
				S.D.	1012.6	855.4	539.0	975.9	
				S.E.	292.3	246.9	155.6	281.7	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.543	
				Trt F-test p-value++					0.126
				Trt*Time p-value++					0.443
				LinTrt*Time p-value#					0.885
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	AMBULATORY	0-10	Mean	251	250	240	256	
				% Difference Control	NA	-0.4	-4.4	2.0	
				S.D.	77.8	74.4	64.8	50.5	
				S.E.	22.5	21.5	18.7	14.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	120	99	64	101	
				% Difference Control	NA	-17.5	-46.7	-15.8	
				S.D.	73.2	53.2	42.1	28.3	
				S.E.	21.1	15.4	12.1	8.2	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	83	48	59	72	
				% Difference Control	NA	-42.2	-28.9	-13.3	
				S.D.	82.4	49.6	55.4	58.5	
				S.E.	23.8	14.3	16.0	16.9	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	79	30	23	64	
				S.D.	78.3	46.2	27.5	66.3	
				S.E.	22.6	13.3	8.0	19.2	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	AMBULATORY	41-50	Mean	38	30	26	29	
				S.D.	83.3	37.1	29.6	31.4	
				S.E.	24.0	10.7	8.5	9.1	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	29	36	8	36	
				S.D.	41.6	53.2	18.3	48.2	
				S.E.	12.0	15.3	5.3	13.9	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	600	494	421	559	
				% Difference Control	NA	-17.7	-29.8	-6.8	
				S.D.	322.3	232.7	143.1	177.7	
				S.E.	93.0	67.2	41.3	51.3	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.507	
				Trt F-test p-value++					0.233
				Trt*Time p-value++					0.319
				LinTrt*Time p-value#					0.681
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	TOTAL	0-10	Mean	1401	1475	1354	1532	
				% Difference Control	NA	5.3	-3.4	9.4	
				S.D.	197.5	227.4	146.3	327.0	
				S.E.	65.8	65.7	46.3	103.4	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	583	768	768	809	
				% Difference Control	NA	31.7	31.7	38.8	
				S.D.	316.8	267.1	210.2	366.2	
				S.E.	105.6	77.1	66.5	115.8	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	212	414	428	372	
				% Difference Control	NA	95.3	101.9	75.5	
				S.D.	192.7	305.1	239.7	342.7	
				S.E.	64.2	88.1	75.8	108.4	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	363	281	375	421	
				S.D.	286.4	280.9	338.1	394.6	
				S.E.	95.5	81.1	106.9	124.8	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	TOTAL	41-50	Mean	248	113	228	362	
				S.D.	306.2	204.5	247.8	419.0	
				S.E.	102.1	59.0	78.4	132.5	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	91	145	192	155	
				S.D.	122.5	233.2	274.3	210.7	
				S.E.	40.8	67.3	86.7	66.6	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	2898	3196	3346	3650	
				% Difference Control	NA	10.3	15.5	25.9	
				S.D.	745.4	975.8	807.7	1101.6	
				S.E.	248.5	281.7	255.4	348.4	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.106	
				Trt F-test p-value++					0.447
				Trt*Time p-value++					0.620
				LinTrt*Time p-value#					0.903
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	AMBULATORY	0-10	Mean	412	410	390	413	
				% Difference Control	NA	-0.5	-5.3	0.2	
				S.D.	121.4	90.3	88.8	120.0	
				S.E.	40.5	26.1	28.1	37.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	102	163	166	168	
				% Difference Control	NA	59.8	62.7	64.7	
				S.D.	75.2	88.5	72.9	132.7	
				S.E.	25.1	25.6	23.1	42.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	30	81	96	70	
				% Difference Control	NA	170.0	220.0	133.3	
				S.D.	44.9	95.0	69.2	88.2	
				S.E.	15.0	27.4	21.9	27.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	71	68	85	80	
				S.D.	76.2	104.9	98.6	89.2	
				S.E.	25.4	30.3	31.2	28.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	AMBULATORY	41-50	Mean	66	20	43	71	
				S.D.	107.8	59.4	56.1	111.3	
				S.E.	35.9	17.1	17.7	35.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	5	30	42	27	
				S.D.	8.1	56.4	80.9	47.1	
				S.E.	2.7	16.3	25.6	14.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	686	773	822	829	
				% Difference Control	NA	12.7	19.8	20.8	
				S.D.	200.2	347.3	282.9	316.6	
				S.E.	66.7	100.3	89.5	100.1	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.281	
				Trt F-test p-value++					0.731
				Trt*Time p-value++					0.827
				LinTrt*Time p-value#					0.765
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	TOTAL	0-10	Mean	1115	1181	1145	1134	
				% Difference Control	NA	5.9	2.7	1.7	
				S.D.	193.7	227.3	134.5	117.9	
				S.E.	64.6	65.6	42.5	37.3	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	486	423	447	444	
				% Difference Control	NA	-13.0	-8.0	-8.6	
				S.D.	369.8	377.9	250.3	301.2	
				S.E.	123.3	109.1	79.2	95.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	295	293	272	284	
				% Difference Control	NA	-0.7	-7.8	-3.7	
				S.D.	353.4	294.4	283.0	398.5	
				S.E.	117.8	85.0	89.5	126.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	199	253	236	286	
				S.D.	320.5	265.2	247.6	421.0	
				S.E.	106.8	76.6	78.3	133.1	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	TOTAL	41-50	Mean	163	228	243	270	
				S.D.	127.2	262.1	314.5	325.6	
				S.E.	42.4	75.7	99.5	103.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	360	260	177	228	
				S.D.	353.2	295.8	267.4	358.8	
				S.E.	117.7	85.4	84.5	113.5	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	2617	2637	2520	2646	
				% Difference Control	NA	0.8	-3.7	1.1	
				S.D.	1021.6	1236.7	1225.7	1503.1	
				S.E.	340.5	357.0	387.6	475.3	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.986	
				Trt F-test p-value++					0.995
				Trt*Time p-value++					0.964
				LinTrt*Time p-value#					0.493
				Covariance Structure					AR1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	AMBULATORY	0-10	Mean	261	275	278	242	
				% Difference Control	NA	5.4	6.5	-7.3	
				S.D.	64.7	78.5	47.2	38.5	
				S.E.	21.6	22.7	14.9	12.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	97	68	57	59	
				% Difference Control	NA	-29.9	-41.2	-39.2	
				S.D.	69.6	89.9	48.4	64.7	
				S.E.	23.2	25.9	15.3	20.5	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	51	47	33	49	
				% Difference Control	NA	-7.8	-35.3	-3.9	
				S.D.	73.5	68.9	50.1	75.8	
				S.E.	24.5	19.9	15.9	24.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	32	45	31	54	
				S.D.	65.1	62.0	38.0	88.3	
				S.E.	21.7	17.9	12.0	27.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	AMBULATORY	41-50	Mean	17	22	42	43	
				S.D.	28.4	33.1	89.8	70.6	
				S.E.	9.5	9.6	28.4	22.3	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	41	42	38	33	
				S.D.	43.2	55.3	68.0	84.7	
				S.E.	14.4	16.0	21.5	26.8	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	498	498	477	479	
				% Difference Control	NA	0.0	-4.2	-3.8	
				S.D.	196.6	252.1	269.3	330.6	
				S.E.	65.5	72.8	85.1	104.6	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.839	
				Trt F-test p-value++					0.996
				Trt*Time p-value++					0.822
				LinTrt*Time p-value#					0.480
				Covariance Structure					AR1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

TABLE S47 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			MALES				
WBC (thous/uL)							
WEEK 4	MEAN	NA	9.56	10.79	8.72	11.11	NA
	S.D.		3.427	2.983	1.669	2.830	
	S.E.		0.989	0.861	0.482	0.817	
	N		12	12	12	12	
RBC (mil/uL)							
WEEK 4	MEAN	NA	9.22	9.28	8.91	8.78c	NA
	S.D.		0.542	0.279	0.345	0.216	
	S.E.		0.156	0.081	0.099	0.062	
	N		12	12	12	12	
HGB (g/dL)							
WEEK 4	MEAN	NA	15.7	15.8	15.2	14.7d	NA
	S.D.		0.72	0.48	0.54	0.44	
	S.E.		0.21	0.14	0.16	0.13	
	N		12	12	12	12	
HCT (%)							
WEEK 4	MEAN	NA	48.1	48.6	46.5	45.0d	NA
	S.D.		2.45	1.59	1.52	1.75	
	S.E.		0.71	0.46	0.44	0.50	
	N		12	12	12	12	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NA = NOT APPLICABLE

TABLE S47 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			MALES				
MCV (fL)							
WEEK 4	MEAN	NA	52.3	52.3	52.2	51.3	NA
	S.D.		1.61	1.20	1.39	1.32	
	S.E.		0.47	0.35	0.40	0.38	
	N		12	12	12	12	
MCH (pg)							
WEEK 4	MEAN	NA	17.0	17.0	17.1	16.8	NA
	S.D.		0.53	0.54	0.48	0.36	
	S.E.		0.15	0.16	0.14	0.10	
	N		12	12	12	12	
MCHC (g/dL)							
WEEK 4	MEAN	NA	32.5	32.6	32.8	32.7	NA
	S.D.		0.60	0.70	0.61	0.73	
	S.E.		0.17	0.20	0.18	0.21	
	N		12	12	12	12	
PLATELET (thous/uL)							
WEEK 4	MEAN	NA	854.	885.	803.	976.c	NA
	S.D.		151.3	83.9	143.7	87.4	
	S.E.		43.7	24.2	41.5	25.2	
	N		12	12	12	12	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

TABLE S47 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

			MALES				
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
PT (seconds)							
WEEK 4	MEAN	NA	17.6	18.6	18.5	17.7	NA
	S.D.		1.27	2.09	1.54	1.09	
	S.E.		0.37	0.60	0.44	0.31	
	N		12	12	12	12	
APTT (seconds)							
WEEK 4	MEAN	NA	21.0	21.9	21.9	22.4	NA
	S.D.		3.05	2.00	2.88	2.78	
	S.E.		0.88	0.58	0.83	0.80	
	N		12	12	12	12	
RETIC (%)							
WEEK 4	MEAN	NA	1.1	1.2	1.0	1.2	NA
	S.D.		0.27	0.28	0.26	0.31	
	S.E.		0.08	0.08	0.08	0.09	
	N		12	12	12	12	
RETIC ABSOLUTE (thous/uL)							
WEEK 4	MEAN	NA	104.0	106.9	93.1	104.6	NA
	S.D.		23.50	24.16	22.29	26.85	
	S.E.		6.78	6.97	6.43	7.75	
	N		12	12	12	12	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

TABLE S47 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			MALES				
MPV (fL)							
WEEK 4	MEAN	NA	6.60	6.42	6.62	6.37	NA
	S.D.		0.524	0.499	0.632	0.489	
	S.E.		0.151	0.144	0.183	0.141	
	N		12	12	12	12	
NEU (%)							
WEEK 4	MEAN	NA	15.2	21.2	20.1	18.4	NA
	S.D.		4.47	7.61	3.58	5.83	
	S.E.		1.29	2.20	1.03	1.68	
	N		12	12	12	12	
LYMPH (%)							
WEEK 4	MEAN	NA	79.0	75.1	75.9	77.8	NA
	S.D.		5.42	7.79	4.75	6.10	
	S.E.		1.56	2.25	1.37	1.76	
	N		12	12	12	12	
MONO (%)							
WEEK 4	MEAN	NA	4.1	2.2	2.5	2.5	NA
	S.D.		3.82	0.43	2.74	1.33	
	S.E.		1.10	0.12	0.79	0.38	
	N		12	12	12	12	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			MALES				
EOS (%)							
WEEK 4	MEAN	NA	1.2	1.0	0.9	0.7	NA
	S.D.		0.76	0.80	0.59	0.64	
	S.E.		0.22	0.23	0.17	0.19	
	N		12	12	12	12	
BASO (%)							
WEEK 4	MEAN	NA	0.2	0.4	0.3	0.3	NA
	S.D.		0.18	0.14	0.15	0.17	
	S.E.		0.05	0.04	0.04	0.05	
	N		12	12	12	12	
LUC (%)							
WEEK 4	MEAN	NA	0.2	0.3	0.3	0.4	NA
	S.D.		0.16	0.14	0.14	0.17	
	S.E.		0.05	0.04	0.04	0.05	
	N		12	12	12	12	
NEU ABSOLUTE (thous/uL)							
WEEK 4	MEAN	NA	1.49	2.24	1.76	1.98	NA
	S.D.		0.832	1.019	0.485	0.676	
	S.E.		0.240	0.294	0.140	0.195	
	N		12	12	12	12	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

MALES

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
LYMPH ABSOLUTE (thous/uL)							
WEEK 4	MEAN	NA	7.54	8.15	6.60	8.70	NA
	S.D.		2.638	2.577	1.202	2.506	
	S.E.		0.761	0.744	0.347	0.723	
	N		12	12	12	12	
MONO ABSOLUTE (thous/uL)							
WEEK 4	MEAN	NA	0.38	0.24	0.24	0.28	NA
	S.D.		0.334	0.095	0.296	0.171	
	S.E.		0.096	0.027	0.085	0.049	
	N		12	12	12	12	
EOS ABSOLUTE (thous/uL)							
WEEK 4	MEAN	NA	0.12	0.09	0.08	0.07	NA
	S.D.		0.092	0.059	0.055	0.068	
	S.E.		0.026	0.017	0.016	0.020	
	N		12	12	12	12	
BASO ABSOLUTE (thous/uL)							
WEEK 4	MEAN	NA	0.02	0.04	0.03	0.04	NA
	S.D.		0.026	0.023	0.016	0.027	
	S.E.		0.008	0.007	0.005	0.008	
	N		12	12	12	12	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			MALES				
LUC ABSOLUTE (thous/uL)							
WEEK 4	MEAN	NA	0.02	0.03	0.02	0.04c	NA
	S.D.		0.017	0.018	0.016	0.027	
	S.E.		0.005	0.005	0.005	0.008	
	N		12	12	12	12	
RDW (%)							
WEEK 4	MEAN	NA	11.4	11.5	11.6	12.5d	NA
	S.D.		0.44	0.43	0.36	0.58	
	S.E.		0.13	0.12	0.10	0.17	
	N		12	12	12	12	
HDW (g/dL)							
WEEK 4	MEAN	NA	2.58	2.68	2.76c	2.77c	NA
	S.D.		0.097	0.122	0.157	0.270	
	S.E.		0.028	0.035	0.045	0.078	
	N		12	12	12	12	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NA = NOT APPLICABLE

TABLE S48 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			FEMALES				
WBC (thous/uL)							
DAY 4	MEAN	NA	5.15	6.89	7.68c	7.59c	NA
	S.D.		1.298	1.583	2.237	1.805	
	S.E.		0.433	0.477	0.708	0.571	
	N		9	11	10	10	
RBC (mil/uL)							
DAY 4	MEAN	NA	6.58	6.86	6.58	6.77	NA
	S.D.		0.538	0.608	0.654	0.429	
	S.E.		0.179	0.183	0.207	0.136	
	N		9	11	10	10	
HGB (g/dL)							
DAY 4	MEAN	NA	12.0	12.1	11.8	11.9	NA
	S.D.		0.65	0.95	0.91	0.66	
	S.E.		0.22	0.29	0.29	0.21	
	N		9	11	10	10	
HCT (%)							
DAY 4	MEAN	NA	37.6	38.1	37.4	36.4	NA
	S.D.		2.02	2.75	3.29	2.23	
	S.E.		0.67	0.83	1.04	0.71	
	N		9	11	10	10	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			FEMALES				
MCV (fL)							
DAY 4	MEAN	NA	57.3	55.6	57.0	53.9	NA
	S.D.		2.61	1.82	4.48	2.14	
	S.E.		0.87	0.55	1.42	0.68	
	N		9	11	10	10	
MCH (pg)							
DAY 4	MEAN	NA	18.3	17.6	17.9	17.5	NA
	S.D.		0.69	0.51	1.08	0.57	
	S.E.		0.23	0.15	0.34	0.18	
	N		9	11	10	10	
MCHC (g/dL)							
DAY 4	MEAN	NA	32.0	31.7	31.5	32.6	NA
	S.D.		0.49	0.56	0.81	0.85	
	S.E.		0.16	0.17	0.26	0.27	
	N		9	11	10	10	
PLATELET (thous/uL)							
DAY 4	MEAN	NA	1271.	1234.	1064.	1220.	NA
	S.D.		153.9	163.8	387.7	153.3	
	S.E.		51.3	49.4	122.6	48.5	
	N		9	11	10	10	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

TABLE S48 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			FEMALES				
PT (seconds)							
DAY 4	MEAN	NA	18.0	17.7	17.3	17.4	NA
	S.D.		0.62	0.70	0.75	0.78	
	S.E.		0.21	0.20	0.24	0.25	
	N		9	12	10	10	
APTT (seconds)							
DAY 4	MEAN	NA	16.8	15.9	15.8	13.9c	NA
	S.D.		1.90	2.28	3.09	1.37	
	S.E.		0.63	0.66	0.98	0.43	
	N		9	12	10	10	
RETIC (%)							
DAY 4	MEAN	NA	4.1	6.1	6.2	4.5	NA
	S.D.		1.29	4.51	2.71	2.15	
	S.E.		0.43	1.36	0.86	0.68	
	N		9	11	10	10	
RETIC ABSOLUTE (thous/uL)							
DAY 4	MEAN	NA	265.7	395.7	401.0	296.5	NA
	S.D.		68.23	259.78	147.68	129.63	
	S.E.		22.74	78.33	46.70	40.99	
	N		9	11	10	10	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

TABLE S48 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

			FEMALES				
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
MPV (fL)							
DAY 4	MEAN	NA	5.74	6.13	6.61c	6.04	NA
	S.D.		0.340	0.352	1.064	0.504	
	S.E.		0.113	0.106	0.336	0.159	
	N		9	11	10	10	
NEU (%)							
DAY 4	MEAN	NA	31.9	31.6	30.7	29.8	NA
	S.D.		5.96	6.47	8.07	11.10	
	S.E.		1.99	1.95	2.55	3.51	
	N		9	11	10	10	
LYMPH (%)							
DAY 4	MEAN	NA	65.6	64.4	65.8	64.8	NA
	S.D.		6.56	7.14	8.20	11.80	
	S.E.		2.19	2.15	2.59	3.73	
	N		9	11	10	10	
MONO (%)							
DAY 4	MEAN	NA	1.9	3.5	2.6	4.6	NA
	S.D.		1.55	2.56	1.24	2.93	
	S.E.		0.52	0.77	0.39	0.93	
	N		9	11	10	10	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

TABLE S48 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF HEMATOLOGY VALUES

			FEMALES				
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
EOS (%)							
DAY 4	MEAN	NA	0.3	0.2	0.3	0.4	NA
	S.D.		0.35	0.13	0.24	0.60	
	S.E.		0.12	0.04	0.07	0.19	
	N		9	11	10	10	
BASO (%)							
DAY 4	MEAN	NA	0.1	0.2	0.2	0.2	NA
	S.D.		0.11	0.12	0.14	0.13	
	S.E.		0.04	0.04	0.04	0.04	
	N		9	11	10	10	
LUC (%)							
DAY 4	MEAN	NA	0.1	0.2	0.4c	0.3	NA
	S.D.		0.09	0.13	0.30	0.24	
	S.E.		0.03	0.04	0.09	0.07	
	N		9	11	10	10	
NEU ABSOLUTE (thous/uL)							
DAY 4	MEAN	NA	1.69	2.11	2.28	2.22	NA
	S.D.		0.710	0.398	0.706	0.871	
	S.E.		0.237	0.120	0.223	0.276	
	N		9	11	10	10	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			FEMALES				
LYMPH ABSOLUTE (thous/uL)							
DAY 4	MEAN	NA	3.32	4.50	5.11c	4.96c	NA
	S.D.		0.607	1.416	1.746	1.599	
	S.E.		0.202	0.427	0.552	0.506	
	N		9	11	10	10	
MONO ABSOLUTE (thous/uL)							
DAY 4	MEAN	NA	0.11	0.24	0.21	0.35c	NA
	S.D.		0.097	0.212	0.117	0.229	
	S.E.		0.032	0.064	0.037	0.072	
	N		9	11	10	10	
EOS ABSOLUTE (thous/uL)							
DAY 4	MEAN	NA	0.02	0.01	0.03	0.03	NA
	S.D.		0.020	0.008	0.025	0.044	
	S.E.		0.007	0.003	0.008	0.014	
	N		9	11	10	10	
BASO ABSOLUTE (thous/uL)							
DAY 4	MEAN	NA	0.01	0.01	0.01	0.01	NA
	S.D.		0.008	0.010	0.012	0.011	
	S.E.		0.003	0.003	0.004	0.003	
	N		9	11	10	10	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			FEMALES				
LUC ABSOLUTE (thous/uL)							
DAY 4	MEAN	NA	0.01	0.01	0.03d	0.02	NA
	S.D.		0.005	0.009	0.025	0.017	
	S.E.		0.002	0.003	0.008	0.005	
	N		9	11	10	10	
RDW (%)							
DAY 4	MEAN	NA	16.6	16.7	17.0	15.3	NA
	S.D.		2.78	3.23	4.14	1.71	
	S.E.		0.93	0.97	1.31	0.54	
	N		9	11	10	10	
HDW (g/dL)							
DAY 4	MEAN	NA	2.53	2.50	2.53	2.53	NA
	S.D.		0.219	0.127	0.156	0.192	
	S.E.		0.073	0.038	0.049	0.061	
	N		9	11	10	10	

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NA = NOT APPLICABLE

TABLE S49 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SERUM CHEMISTRY VALUES

			MALES				
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
ALBUMIN (g/dL)							
WEEK 4	MEAN	NA	4.4	4.3	4.3	4.4	NA
	S.D.		0.20	0.16	0.16	0.17	
	S.E.		0.06	0.05	0.05	0.05	
	N		12	12	12	12	
TOTAL PROTEIN (g/dL)							
WEEK 4	MEAN	NA	6.6	6.4	6.5	6.6	NA
	S.D.		0.24	0.22	0.20	0.23	
	S.E.		0.07	0.06	0.06	0.07	
	N		12	12	12	12	
GLOBULIN (g/dL)							
WEEK 4	MEAN	NA	2.2	2.1	2.2	2.2	NA
	S.D.		0.19	0.15	0.16	0.15	
	S.E.		0.06	0.04	0.05	0.04	
	N		12	12	12	12	
A/G RATIO							
WEEK 4	MEAN	NA	2.00	2.07	1.96	2.08	NA
	S.D.		0.205	0.203	0.168	0.157	
	S.E.		0.059	0.059	0.048	0.045	
	N		12	12	12	12	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

		MALES					
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
TOTAL BILI (mg/dL)							
WEEK 4	MEAN	NA	0.21	0.21	0.20	0.20	NA
	S.D.		0.024	0.026	0.029	0.041	
	S.E.		0.007	0.008	0.008	0.012	
	N		12	12	12	12	
UREA NITROGEN (mg/dL)							
WEEK 4	MEAN	NA	11.0	11.0	10.6	10.4	NA
	S.D.		1.78	1.08	1.46	1.30	
	S.E.		0.51	0.31	0.42	0.37	
	N		12	12	12	12	
CREATININE (mg/dL)							
WEEK 4	MEAN	NA	0.3	0.3	0.3	0.4d	NA
	S.D.		0.09	0.05	0.06	0.05	
	S.E.		0.03	0.01	0.02	0.01	
	N		12	12	12	12	
ALP (U/L)							
WEEK 4	MEAN	NA	125.	137.	146.	152.	NA
	S.D.		23.2	28.5	26.0	34.0	
	S.E.		6.7	8.2	7.5	9.8	
	N		12	12	12	12	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NA = NOT APPLICABLE

TABLE S49 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SERUM CHEMISTRY VALUES

MALES

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
ALT (U/L)							
WEEK 4	MEAN	NA	34.	37.	34.	42.	NA
	S.D.		5.3	12.0	6.2	6.7	
	S.E.		1.5	3.5	1.8	1.9	
	N		12	12	12	12	
AST (U/L)							
WEEK 4	MEAN	NA	97.	98.	94.	97.	NA
	S.D.		22.1	26.0	13.1	17.8	
	S.E.		6.4	7.5	3.8	5.2	
	N		12	12	12	12	
GGT (U/L)							
WEEK 4	MEAN	NA	0.3	0.3	0.4	0.5	NA
	S.D.		0.49	0.31	0.50	0.73	
	S.E.		0.14	0.09	0.15	0.21	
	N		12	12	12	12	
GLUCOSE (mg/dL)							
WEEK 4	MEAN	NA	119.	118.	114.	114.	NA
	S.D.		13.4	15.4	8.3	15.5	
	S.E.		3.9	4.4	2.4	4.5	
	N		12	12	12	12	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

		MALES					
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
CHOLESTEROL (mg/dL)							
WEEK 4	MEAN	NA	50.	45.	46.	52.	NA
	S.D.		13.5	7.3	8.2	10.1	
	S.E.		3.9	2.1	2.4	2.9	
	N		12	12	12	12	
CALCIUM (mg/dL)							
WEEK 4	MEAN	NA	11.3	11.2	11.3	11.4	NA
	S.D.		0.51	0.36	0.37	0.35	
	S.E.		0.15	0.10	0.11	0.10	
	N		12	12	12	12	
CHLORIDE (mEq/L)							
WEEK 4	MEAN	NA	104.	104.	103.	102.d	NA
	S.D.		1.1	0.8	1.0	1.3	
	S.E.		0.3	0.2	0.3	0.4	
	N		12	12	12	12	
PHOSPHORUS (mg/dL)							
WEEK 4	MEAN	NA	7.8	7.4	7.2	7.3	NA
	S.D.		0.85	0.58	0.65	0.79	
	S.E.		0.25	0.17	0.19	0.23	
	N		12	12	12	12	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NA = NOT APPLICABLE

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			MALES				
POTASSIUM (mEq/L)							
WEEK 4	MEAN	NA	4.98	4.78	4.71	4.69	NA
	S.D.		0.533	0.453	0.364	0.301	
	S.E.		0.154	0.131	0.105	0.087	
	N		12	12	12	12	
SODIUM (mEq/L)							
WEEK 4	MEAN	NA	146.	146.	147.	146.	NA
	S.D.		2.6	1.9	2.0	2.0	
	S.E.		0.7	0.5	0.6	0.6	
	N		12	12	12	12	
TRIGLYCERIDE (mg/dL)							
WEEK 4	MEAN	NA	44.	44.	52.	36.	NA
	S.D.		10.5	9.0	12.6	9.2	
	S.E.		3.0	2.6	3.6	2.6	
	N		12	12	12	12	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

TABLE S50 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SERUM CHEMISTRY VALUES

		FEMALES					
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
ALBUMIN (g/dL)							
DAY 4	MEAN	NA	4.3	4.3	4.3	4.7c	NA
	S.D.		0.22	0.26	0.30	0.30	
	S.E.		0.07	0.08	0.09	0.09	
	N		9	12	10	10	
TOTAL PROTEIN (g/dL)							
DAY 4	MEAN	NA	6.3	6.2	6.3	6.7c	NA
	S.D.		0.27	0.44	0.36	0.35	
	S.E.		0.09	0.13	0.11	0.11	
	N		9	12	10	10	
GLOBULIN (g/dL)							
DAY 4	MEAN	NA	1.9	1.9	2.0	2.1	NA
	S.D.		0.21	0.26	0.17	0.16	
	S.E.		0.07	0.08	0.05	0.05	
	N		9	12	10	10	
A/G RATIO							
DAY 4	MEAN	NA	2.23	2.22	2.11	2.29	NA
	S.D.		0.297	0.263	0.193	0.271	
	S.E.		0.099	0.076	0.061	0.086	
	N		9	12	10	10	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

TABLE S50 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SERUM CHEMISTRY VALUES

			FEMALES				
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
TOTAL BILI (mg/dL)							
DAY 4	MEAN	NA	0.16	0.16	0.15	0.15	NA
	S.D.		0.018	0.041	0.030	0.017	
	S.E.		0.006	0.012	0.009	0.005	
	N		9	12	10	10	
UREA NITROGEN (mg/dL)							
DAY 4	MEAN	NA	10.9	10.4	12.0	12.6	NA
	S.D.		1.92	2.17	2.79	3.75	
	S.E.		0.64	0.63	0.88	1.19	
	N		9	12	10	10	
CREATININE (mg/dL)							
DAY 4	MEAN	NA	0.3	0.3	0.4	0.3	NA
	S.D.		0.04	0.05	0.07	0.09	
	S.E.		0.01	0.01	0.02	0.03	
	N		9	12	10	10	
ALP (U/L)							
DAY 4	MEAN	NA	108.	119.	96.	114.	NA
	S.D.		26.5	32.0	40.7	32.8	
	S.E.		8.8	9.2	12.9	10.4	
	N		9	12	10	10	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

TABLE S50 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SERUM CHEMISTRY VALUES

		FEMALES					
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
ALT (U/L)							
DAY 4	MEAN	NA	63.	82.	77.	78.	NA
	S.D.		8.0	12.2	26.4	55.5	
	S.E.		2.7	3.5	8.3	17.6	
	N		9	12	10	10	
AST (U/L)							
DAY 4	MEAN	NA	118.	132.	119.	110.	NA
	S.D.		26.7	27.0	29.1	43.9	
	S.E.		8.9	7.8	9.2	13.9	
	N		9	12	10	10	
GGT (U/L)							
DAY 4	MEAN	NA	0.5	0.2	0.3	0.7	NA
	S.D.		0.38	0.16	0.37	0.78	
	S.E.		0.13	0.05	0.12	0.25	
	N		9	12	10	10	
GLUCOSE (mg/dL)							
DAY 4	MEAN	NA	115.	118.	123.	130.c	NA
	S.D.		10.7	12.7	11.2	8.0	
	S.E.		3.6	3.7	3.5	2.5	
	N		9	12	10	10	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
NA = NOT APPLICABLE

TABLE S50 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SERUM CHEMISTRY VALUES

		FEMALES					
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
CHOLESTEROL (mg/dL)							
DAY 4	MEAN	NA	69.	64.	68.	89.c	NA
	S.D.		14.1	10.3	10.0	18.9	
	S.E.		4.7	3.0	3.2	6.0	
	N		9	12	10	10	
CALCIUM (mg/dL)							
	MEAN	NA	10.6	10.6	11.1	11.5d	NA
	S.D.		0.44	0.42	0.46	0.58	
	S.E.		0.15	0.12	0.15	0.18	
	N		9	12	10	10	
CHLORIDE (mEq/L)							
DAY 4	MEAN	NA	103.	104.	104.	102.	NA
	S.D.		1.3	1.6	2.8	1.4	
	S.E.		0.4	0.5	0.9	0.4	
	N		9	12	10	10	
PHOSPHORUS (mg/dL)							
DAY 4	MEAN	NA	3.9	4.5	5.4c	5.5c	NA
	S.D.		0.63	0.93	1.70	1.23	
	S.E.		0.21	0.27	0.54	0.39	
	N		9	12	10	10	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NA = NOT APPLICABLE

ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			FEMALES				
POTASSIUM (mEq/L)							
DAY 4	MEAN	NA	4.12	4.38	4.77d	4.61	NA
	S.D.		0.305	0.264	0.750	0.292	
	S.E.		0.102	0.076	0.237	0.092	
	N		9	12	10	10	
SODIUM (mEq/L)							
DAY 4	MEAN	NA	142.	143.	144.	142.	NA
	S.D.		1.4	1.6	2.4	1.4	
	S.E.		0.5	0.5	0.7	0.4	
	N		9	12	10	10	
TRIGLYCERIDE (mg/dL)							
DAY 4	MEAN	NA	43.	61.	41.	42.	NA
	S.D.		8.9	73.6	10.6	11.5	
	S.E.		3.0	21.3	3.4	3.6	
	N		9	12	10	10	

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
d = Significantly different from control group 2 at 0.01 using Dunnett's test
NA = NOT APPLICABLE

PCPSv5.30
12/10/2010
R:03/09/2011

TABLE S51 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SPECIAL CHEMISTRY VALUES

			MALES				
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
BILE ACIDS (umol/L)							
WEEK 4	MEAN	NA	14.8	13.2	9.3	10.5	NA
	S.D.		10.66	8.06	5.08	12.23	
	S.E.		3.08	2.33	1.47	3.53	
	N		12	12	12	12	

umol/L = micromoles/Liter

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

PCPSv5.30
12/10/2010
R:01/07/2011

TABLE S52 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SPECIAL CHEMISTRY VALUES

			FEMALES				
ANALYSIS	GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
BILE ACIDS (umol/L)							
DAY 4	MEAN	NA	28.8	23.3	29.2	46.0	NA
	S.D.		9.96	8.27	18.21	29.95	
	S.E.		3.32	2.39	5.76	9.47	
	N		9	12	10	10	

umol/L = micromoles/Liter

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4 and 5.
None significantly different from control group
NA = NOT APPLICABLE

PCPSv5.30
12/10/2010
R:01/07/2011

TABLE S53 (F0)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 1

SPONSOR:AMERICAN PETROLEUM SUMMARY OF REPRODUCTIVE PERFORMANCE

DOSE GROUP	1		2		3		4		5		6	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
MALES ON STUDY	5		12		12		12		12		5	
MALES THAT DIED	0		0		0		0		0		0	
MALES PAIRED FOR MATING	5		12		12		12		12		5	
MALES WITH EVIDENCE OF MATING	5	100.0	12	100.0	12	100.0	10	83.3	12	100.0	5	100.0
NO. THAT SIRED A LITTER	5	100.0	9	75.0	12	100.0	10	100.0	12	100.0	5	100.0
NO. THAT DID NOT SIRE A LITTER	0	0.0	3	25.0	0	0.0	0	0.0	0	0.0	0	0.0
MALES WITH NO EVIDENCE OF MATING	0	0.0	0	0.0	0	0.0	2	16.7	0	0.0	0	0.0
NO. THAT SIRED A LITTER		NA		NA		NA	0	0.0		NA		NA
NO. THAT DID NOT SIRE A LITTER		NA		NA		NA	2	100.0		NA		NA
MALES THAT SIRED MORE THAN 1 LITTER	0		0		0		0		0		0	

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NOTE: MALES WERE CONSIDERED TO HAVE SIRED A LITTER IF THE PAIRED FEMALE WAS GRAVID

NOTE: POSITIVE EVIDENCE OF MATING DURING THE BREEDING PERIOD WAS CONFIRMED BY THE PRESENCE OF SPERM IN A VAGINAL LAVAGE OR A VAGINAL COPULATORY PLUG

NA = NOT APPLICABLE

TABLE S53 (F0)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF REPRODUCTIVE PERFORMANCE

DOSE GROUP	1		2		3		4		5		6	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
FEMALES ON STUDY	5		12		12		12		12		5	
FEMALES THAT DIED	0		0		0		0		1-A		0	
FEMALES PAIRED FOR MATING	5		12		12		12		12		5	
NONGRAVID	0	0.0	3	25.0	0	0.0	2	16.7	0	0.0	0	0.0
GRAVID	5	100.0	9	75.0	12	100.0	10	83.3	12	100.0	5	100.0
DELIVERED	5	100.0	9	100.0	12	100.0	10	100.0	12	100.0	5	100.0
FEMALES WITH TOTAL LITTER LOSS	0	0.0	0	0.0	0	0.0	0	0.0	1	8.3	0	0.0
FEMALES WITH VIABLE PUPS	5	100.0	9	100.0	12	100.0	10	100.0	11	91.7	5	100.0
FAILED TO DELIVER	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
FEMALES WITH EVIDENCE OF MATING	5	100.0	12	100.0	12	100.0	10	83.3	12	100.0	5	100.0
NO. GRAVID	5	100.0	9	75.0	12	100.0	10	100.0	12	100.0	5	100.0
NO. NONGRAVID	0	0.0	3	25.0	0	0.0	0	0.0	0	0.0	0	0.0
FEMALES WITH NO EVIDENCE OF MATING	0	0.0	0	0.0	0	0.0	2	16.7	0	0.0	0	0.0
NO. GRAVID		NA		NA		NA	0	0.0		NA		NA
NO. NONGRAVID		NA		NA		NA	2	100.0		NA		NA
TOTAL FEMALES GRAVID	5	100.0	9	75.0	12	100.0	10	83.3	12	100.0	5	100.0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NOTE: POSITIVE EVIDENCE OF MATING DURING THE BREEDING PERIOD WAS CONFIRMED BY THE PRESENCE OF SPERM IN A VAGINAL LAVAGE OR A VAGINAL COPULATORY PLUG.

NA = NOT APPLICABLE

A = FEMALE NO. 81964 WAS EUTHANIZED IN EXTREMIS FOLLOWING THE BREEDING PERIOD; INCLUDED IN THE CALCULATIONS

TABLE S53 (F0)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 3

SPONSOR:AMERICAN PETROLEUM SUMMARY OF REPRODUCTIVE PERFORMANCE

DOSE GROUP	1		2		3		4		5		6	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
MALE MATING INDEX	5/5	100.0	12/12	100.0	12/12	100.0	10/12	83.3	12/12	100.0	5/5	100.0
FEMALE MATING INDEX	5/5	100.0	12/12	100.0	12/12	100.0	10/12	83.3	12/12	100.0	5/5	100.0
MALE FERTILITY INDEX	5/5	100.0	9/12	75.0	12/12	100.0	10/12	83.3	12/12	100.0	5/5	100.0
FEMALE FERTILITY INDEX	5/5	100.0	9/12	75.0	12/12	100.0	10/12	83.3	12/12	100.0	5/5	100.0
MALE COPULATION INDEX	5/5	100.0	9/12	75.0	12/12	100.0	10/10	100.0	12/12	100.0	5/5	100.0
FEMALE CONCEPTION INDEX	5/5	100.0	9/12	75.0	12/12	100.0	10/10	100.0	12/12	100.0	5/5	100.0
MEAN PRE-COITAL INTERVALS												
DAYS	2.8	NA	1.4b	NA	2.3	NA	4.2c	NA	3.8	NA	2.0	NA
S.D.	0.84	NA	0.67	NA	1.14	NA	3.33	NA	3.49	NA	0.71	NA
S.E.	0.37	NA	0.19	NA	0.33	NA	1.05	NA	1.01	NA	0.32	NA
N	5	NA	12	NA	12	NA	10	NA	12	NA	5	NA

$$\text{MALE (FEMALE) MATING INDEX (\%)} = \frac{\text{NO. OF MALES (FEMALES) WITH EVIDENCE OF MATING (OR CONFIRMED PREGNANCY)}}{\text{TOTAL NO. OF MALES (FEMALES) USED FOR MATING}} \times 100$$

$$\text{MALE FERTILITY INDEX (\%)} = \frac{\text{NO. OF MALES SIRING A LITTER}}{\text{TOTAL NO. OF MALES USED FOR MATING}} \times 100$$

$$\text{FEMALE FERTILITY INDEX (\%)} = \frac{\text{NO. OF FEMALES WITH CONFIRMED PREGNANCY}}{\text{TOTAL NO. OF FEMALES USED FOR MATING}} \times 100$$

$$\text{MALE COPULATION INDEX (\%)} = \frac{\text{NO. OF MALES SIRING A LITTER}}{\text{NO. OF MALES WITH EVIDENCE OF MATING (OR FEMALES CONFIRMED PREGNANT)}} \times 100$$

$$\text{FEMALE CONCEPTION INDEX (\%)} = \frac{\text{NO. OF FEMALES WITH CONFIRMED PREGNANCY}}{\text{NO. OF FEMALES WITH EVIDENCE OF MATING (OR CONFIRMED PREGNANCY)}} \times 100$$

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MATING, FERTILITY AND COPULATION/CONCEPTION INDICES NOT SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP USING CHI-SQUARE TEST

NA = NOT APPLICABLE

MODIFIED STATISTICS USED.

For statistical analyses of pre-coital intervals, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4, and 5; control group 1 was compared to group 6.

b = Significantly different from control group 1 at 0.01 using two-sample t-test

c = Significantly different from control group 2 at 0.05 using Dunnett's test

TABLE S54 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF GESTATION LENGTHS [DAYS]

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
GESTATION LENGTH (DAYS)						
MEAN	21.4	21.9	21.9	22.0	22.1	21.2
S.D.	0.55	0.60	0.29	0.47	0.51	0.45
S.E.	0.24	0.20	0.08	0.15	0.15	0.20
N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

PGLv5.08
12/15/2010
R:01/20/2011

TABLE S55 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM SUMMARY OF PARTURITION FINDINGS: TOTAL OCCURRENCE/NO. OF FEMALES

CATEGORY FINDING	GROUP: 1	2	3	4	5	6
PARTURITION OBS						
NO PRE-DELIVERY FINDINGS	18/ 5	71/ 12	48/ 12	114/ 12	51/ 12	16/ 5
VAGINAL DISCHARGE/MATERIAL	0/ 0	0/ 0	2/ 2	1/ 1	5/ 3	0/ 0
PUPS PRESENT IN NESTING BOX	5/ 5	9/ 9	12/ 12	10/ 10	12/ 12	5/ 5
NO SIGNIFICANT FINDINGS DURING PARTURITION	7/ 5	12/ 9	12/ 12	13/ 10	15/ 12	7/ 5

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S56 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	MALE					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	5	12	12	12	12	5
CECUM						
-DISTENDED	0	0	1	0	0	0
DUODENUM						
-CONTENTS, DARK GREEN	0	0	1	0	0	0
EPIDIDYMIDES						
-SMALL	1	0	0	0	0	0
ILEUM						
-DISTENDED	0	0	1	0	0	0
JEJUNUM						
-CONTENTS, DARK GREEN	0	0	1	0	0	0
KIDNEYS						
-DILATED PELVIS	0	0	1	0	0	0
-PALE	0	0	0	0	5	0
-AREA(S), DARK RED	0	0	0	0	1	0
-AREA(S), DEPRESSED	0	0	1	0	0	0
LIVER						
-AREA(S), WHITE	0	0	1	1	0	0
-SWOLLEN	0	1	0	0	0	0
LN, MANDIBULAR						
-DISCOLORATION, DARK RED	0	1	1	0	0	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S56 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	M A L E					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	5	12	12	12	12	5
SKIN						
-MATTING, BROWN	0	0	0	0	0	1
STOMACH						
-CONTENTS, THICK GREEN	0	0	2	0	0	0
TESTES						
-UNDESCENDED	1	0	0	0	0	0
-SMALL	1	0	0	0	0	0
THYMUS						
-AREA(S), DARK RED	0	0	1	2	0	0
URINARY BLADDER						
-DISTENDED	0	0	0	0	1	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	4	10	7	9	7	4

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

PGRSI2v4.09
02/23/2011

TABLE S57 (F0 FEMALES - UNSCHEDULED DEATH)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MACROSCOPIC FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
ADRENAL GLANDS						
-PALE	0	0	0	0	1	0
BRAIN						
-PALE	0	0	0	0	1	0
LIVER						
-AREA(S), WHITE	0	0	0	0	1	0
PITUITARY						
-PALE	0	0	0	0	1	0
STOMACH						
-DISTENDED	0	0	0	0	1	0
THYMUS						
-SMALL	0	0	0	0	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

PGRSI2v4.09
02/23/2011

TABLE S58 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	3	0	2	0	0
CERVIX						
-SWOLLEN	0	1	0	0	0	0
KIDNEYS						
-AREA(S), WHITE	0	0	0	1	0	0
THYROID GLANDS						
-SMALL	0	1	0	0	0	0
UTERUS						
-CONTENTS, CLEAR FLUID	0	1	0	2	0	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	0	2	0	0	0	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

PGRSI2v4.09
02/23/2011

TABLE S59 (F0 FEMALES - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	----- F E M A L E -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	0	0	0	0	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

PGRSI2v4.09
02/23/2011

TABLE S60 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	----- F E M A L E -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	5	9	12	10	10	5
KIDNEYS						
-AREA(S), DEPRESSED	0	1	1	1	0	3
-DILATED PELVIS	1	0	0	0	0	0
LIVER						
-AREA(S), DARK RED	0	0	1	0	0	0
LN, MANDIBULAR						
-ENLARGED	0	0	0	1	0	0
LUNGS						
-DISCOLORATION, DARK RED	0	0	0	0	0	2
THYMUS						
-AREA(S), DARK RED	2	0	0	0	0	0
-DISCOLORATION, DARK RED	0	0	0	0	0	1
-SMALL	0	0	1	0	1	0
TRACHEA						
-CONTENTS, DARK RED	0	0	0	0	0	1
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	3	8	10	8	9	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

PGRSI2v4.09
03/09/2011

TABLE S61 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF CORPORA LUTEA AND IMPLANTATION SITES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
IMPLANTATION SITES						
MEAN	15.8	15.0	13.6	13.0	12.2	12.8f
S.D.	1.10	2.45	1.08	1.15	3.74	0.84
S.E.	0.49	0.82	0.31	0.37	1.08	0.37
N	5	9	12	10	12	5
NUMBER BORN						
MEAN	14.6	14.1	12.9	12.0	10.8d	12.4f
S.D.	1.14	1.90	1.08	1.56	3.79	0.89
S.E.	0.51	0.63	0.31	0.49	1.09	0.40
N	5	9	12	10	12	5
UNACCOUNTED SITES						
MEAN	1.2	0.9	0.7	1.0	1.4	0.4
S.D.	1.64	0.78	0.98	0.82	1.24	0.55
S.E.	0.73	0.26	0.28	0.26	0.36	0.24
N	5	9	12	10	12	5
CORPORA LUTEA						
MEAN	17.8	15.6	14.0	15.1	13.8	13.6e
S.D.	3.35	2.30	1.35	2.96	2.09	0.89
S.E.	1.50	0.77	0.39	0.94	0.60	0.40
N	5	9	12	10	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
d = Significantly different from control group 2 at 0.01 using Dunnett's test
e = Significantly different from control group 1 at 0.05 using two-sample t-test
f = Significantly different from control group 1 at 0.01 using two-sample t-test
NOTE: ONLY DAMS THAT HAVE DELIVERED ONE OR MORE PUPS ARE INCLUDED IN CALCULATION OF MEAN.

PISSUv5.12
01/31/2011
R:01/31/2011

TABLE S62 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	MALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
FINAL BODY WT (G)						
MEAN	467.	454.	448.	439.	412.	466.
S.D.	26.8	45.2	44.6	34.4	27.8	19.4
S.E.	12.0	13.0	12.9	9.9	8.0	8.7
N	5	12	12	12	12	5
ADRENAL GLANDS (G)						
MEAN	0.0569	0.0557	0.0607	0.0612	0.0596	0.0669
S.D.	0.00940	0.00716	0.01098	0.00849	0.00744	0.00696
S.E.	0.00420	0.00207	0.00317	0.00245	0.00215	0.00311
N	5	12	12	12	12	5
ADRENAL GLANDS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.012	0.012	0.014	0.014	0.015	0.014e
S.D.	0.0016	0.0019	0.0020	0.0017	0.0020	0.0013
S.E.	0.0007	0.0006	0.0006	0.0005	0.0006	0.0006
N	5	12	12	12	12	5
ADRENAL GLANDS (G/100 G BRAIN)						
MEAN	2.748	2.704	2.900	2.926	2.941	3.241e
S.D.	0.3773	0.3487	0.4774	0.3393	0.3389	0.2026
S.E.	0.1687	0.1006	0.1378	0.0979	0.0978	0.0906
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
e = Significantly different from control group 1 at 0.01 using two-sample t-test

MALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
BRAIN (G)						
MEAN	2.06	2.06	2.09	2.09	2.03	2.06
S.D.	0.133	0.052	0.099	0.102	0.044	0.122
S.E.	0.059	0.015	0.029	0.029	0.013	0.055
N	5	12	12	12	12	5
BRAIN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.443	0.457	0.470	0.478	0.493	0.443
S.D.	0.0268	0.0448	0.0432	0.0365	0.0316	0.0299
S.E.	0.0120	0.0129	0.0125	0.0105	0.0091	0.0134
N	5	12	12	12	12	5
EPIDIDYMIS, LT (G)						
MEAN	0.57	0.60	0.60	0.66c	0.63	0.62
S.D.	0.135	0.051	0.043	0.050	0.061	0.044
S.E.	0.061	0.015	0.013	0.014	0.017	0.020
N	5	12	12	12	12	5
EPIDIDYMIS, LT (G/100 G FINAL BODY WEIGHT)						
MEAN	0.121	0.133	0.135	0.151c	0.152c	0.134
S.D.	0.0255	0.0175	0.0155	0.0142	0.0141	0.0082
S.E.	0.0114	0.0050	0.0045	0.0041	0.0041	0.0037
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
			MALES			
EPIDIDYMIS, LT (G/100 G BRAIN)						
MEAN	27.397	29.013	28.691	31.640c	30.858	30.262
S.D.	5.3387	2.7785	1.7838	2.6307	2.8091	1.1463
S.E.	2.3875	0.8021	0.5149	0.7594	0.8109	0.5126
N	5	12	12	12	12	5
EPIDIDYMIS, RT (G)						
MEAN	0.62	0.62	0.61	0.66	0.65	0.65
S.D.	0.040	0.055	0.033	0.045	0.065	0.041
S.E.	0.018	0.016	0.009	0.013	0.019	0.019
N	5	12	12	12	12	5
EPIDIDYMIS, RT (G/100 G FINAL BODY WEIGHT)						
MEAN	0.133	0.138	0.138	0.152	0.158d	0.139
S.D.	0.0143	0.0172	0.0152	0.0142	0.0125	0.0087
S.E.	0.0064	0.0050	0.0044	0.0041	0.0036	0.0039
N	5	12	12	12	12	5
EPIDIDYMIS, RT (G/100 G BRAIN)						
MEAN	29.990	30.136	29.272	31.884	32.214	31.432
S.D.	3.3636	2.8589	1.6054	2.5005	3.0292	1.0303
S.E.	1.5043	0.8253	0.4634	0.7218	0.8744	0.4608
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test

TABLE S62 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	MALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
HEART (G)						
MEAN	1.47	1.46	1.41	1.43	1.32	1.53
S.D.	0.093	0.208	0.138	0.130	0.130	0.073
S.E.	0.042	0.060	0.040	0.038	0.038	0.033
N	5	12	12	12	12	5
HEART (G/100 G FINAL BODY WEIGHT)						
MEAN	0.315	0.321	0.315	0.326	0.320	0.328
S.D.	0.0158	0.0255	0.0215	0.0204	0.0233	0.0122
S.E.	0.0071	0.0074	0.0062	0.0059	0.0067	0.0054
N	5	12	12	12	12	5
HEART (G/100 G BRAIN)						
MEAN	71.298	70.823	67.373	68.631	65.158	74.230
S.D.	5.5460	9.8339	6.6408	6.2431	5.9835	4.0085
S.E.	2.4802	2.8388	1.9170	1.8022	1.7273	1.7926
N	5	12	12	12	12	5
KIDNEYS (G)						
MEAN	3.51	3.21a	3.38	3.53	3.77d	3.63
S.D.	0.251	0.203	0.393	0.332	0.460	0.579
S.E.	0.112	0.059	0.114	0.096	0.133	0.259
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
a = Significantly different from control group 1 at 0.05 using two-sample t-test
d = Significantly different from control group 2 at 0.01 using Dunnett's test

	MALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
KIDNEYS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.755	0.711	0.756	0.804d	0.912d	0.778
S.D.	0.0736	0.0561	0.0687	0.0413	0.0609	0.0944
S.E.	0.0329	0.0162	0.0198	0.0119	0.0176	0.0422
N	5	12	12	12	12	5
KIDNEYS (G/100 G BRAIN)						
MEAN	170.289	155.993a	161.424	169.355	186.088d	175.847
S.D.	11.2352	11.4689	13.9056	16.9337	21.9910	21.6472
S.E.	5.0245	3.3108	4.0142	4.8883	6.3483	9.6809
N	5	12	12	12	12	5
LIVER (G)						
MEAN	15.61	13.46a	13.98	15.69c	19.94d	15.86
S.D.	1.429	2.009	2.041	1.834	2.085	1.571
S.E.	0.639	0.580	0.589	0.529	0.602	0.703
N	5	12	12	12	12	5
LIVER (G/100 G FINAL BODY WEIGHT)						
MEAN	3.340	2.957b	3.113	3.574d	4.834d	3.403
S.D.	0.1367	0.2342	0.2273	0.2688	0.3034	0.2505
S.E.	0.0611	0.0676	0.0656	0.0776	0.0876	0.1120
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
a = Significantly different from control group 1 at 0.05 using two-sample t-test
b = Significantly different from control group 1 at 0.01 using two-sample t-test
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test

	MALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
LIVER (G/100 G BRAIN)						
MEAN	756.866	653.247a	668.386	752.708c	984.938d	769.225
S.D.	62.8428	91.9818	84.8982	87.3067	102.1051	57.4442
S.E.	28.1042	26.5529	24.5080	25.2033	29.4752	25.6898
N	5	12	12	12	12	5
LUNGS (G)						
MEAN	1.60	1.55	1.51	1.51	1.41	1.62
S.D.	0.131	0.205	0.129	0.191	0.121	0.243
S.E.	0.059	0.059	0.037	0.055	0.035	0.109
N	5	12	12	12	12	5
LUNGS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.344	0.342	0.338	0.344	0.343	0.349
S.D.	0.0269	0.0328	0.0333	0.0434	0.0370	0.0608
S.E.	0.0121	0.0095	0.0096	0.0125	0.0107	0.0272
N	5	12	12	12	12	5
LUNGS (G/100 G BRAIN)						
MEAN	77.550	75.310	72.208	72.183	69.417	78.417
S.D.	1.4742	10.0918	7.4397	8.6968	5.0235	8.1188
S.E.	0.6593	2.9132	2.1476	2.5105	1.4502	3.6308
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
a = Significantly different from control group 1 at 0.05 using two-sample t-test
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test

MALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
SPLEEN (G)						
MEAN	0.78	0.64a	0.68	0.67	0.64	0.52f
S.D.	0.109	0.092	0.116	0.093	0.060	0.056
S.E.	0.049	0.027	0.034	0.027	0.017	0.025
N	5	12	12	12	12	5
SPLEEN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.167	0.142a	0.152	0.153	0.155	0.112f
S.D.	0.0198	0.0212	0.0223	0.0169	0.0138	0.0139
S.E.	0.0088	0.0061	0.0064	0.0049	0.0040	0.0062
N	5	12	12	12	12	5
SPLEEN (G/100 G BRAIN)						
MEAN	37.788	31.279a	32.520	32.038	31.481	25.223f
S.D.	3.4281	4.7275	5.3220	3.7716	2.8849	2.3874
S.E.	1.5331	1.3647	1.5363	1.0888	0.8328	1.0677
N	5	12	12	12	12	5
TESTIS, LT (G)						
MEAN	1.47	1.67	1.65	1.82	1.68	1.74
S.D.	0.386	0.161	0.161	0.155	0.163	0.155
S.E.	0.173	0.047	0.047	0.045	0.047	0.069
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
a = Significantly different from control group 1 at 0.05 using two-sample t-test
f = Significantly different from control group 1 at 0.01 using two-sample t-test

	MALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
TESTIS, LT (G/100 G FINAL BODY WEIGHT)						
MEAN	0.313	0.370	0.372	0.417c	0.407	0.375
S.D.	0.0732	0.0441	0.0537	0.0345	0.0312	0.0342
S.E.	0.0328	0.0127	0.0155	0.0100	0.0090	0.0153
N	5	12	12	12	12	5
TESTIS, LT (G/100 G BRAIN)						
MEAN	70.827	81.071	78.878	87.519	82.707	84.712
S.D.	16.2429	8.1284	6.5935	7.9754	7.1174	7.7801
S.E.	7.2640	2.3465	1.9034	2.3023	2.0546	3.4794
N	5	12	12	12	12	5
TESTIS, RT (G)						
MEAN	1.68	1.66	1.64	1.80	1.69	1.77
S.D.	0.078	0.151	0.152	0.114	0.174	0.152
S.E.	0.035	0.043	0.044	0.033	0.050	0.068
N	5	12	12	12	12	5
TESTIS, RT (G/100 G FINAL BODY WEIGHT)						
MEAN	0.360	0.368	0.369	0.412c	0.410c	0.380
S.D.	0.0232	0.0400	0.0524	0.0373	0.0300	0.0316
S.E.	0.0104	0.0115	0.0151	0.0108	0.0087	0.0141
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test

	MALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
TESTIS, RT (G/100 G BRAIN)						
MEAN	81.322	80.757	78.276	86.318	83.309	85.943
S.D.	3.3567	7.7416	6.5417	6.1947	7.6447	8.5031
S.E.	1.5012	2.2348	1.8884	1.7882	2.2068	3.8027
N	5	12	12	12	12	5
THYMUS (G)						
MEAN	0.3593	0.3406	0.3133	0.2981	0.2723	0.1741f
S.D.	0.09378	0.11728	0.10150	0.05806	0.06655	0.04149
S.E.	0.04194	0.03386	0.02930	0.01676	0.01921	0.01855
N	5	12	12	12	12	5
THYMUS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.077	0.075	0.070	0.068	0.067	0.038f
S.D.	0.0200	0.0257	0.0199	0.0118	0.0181	0.0099
S.E.	0.0089	0.0074	0.0058	0.0034	0.0052	0.0044
N	5	12	12	12	12	5
THYMUS (G/100 G BRAIN)						
MEAN	17.288	16.582	15.036	14.291	13.448	8.434f
S.D.	3.4730	5.7990	4.9199	2.7754	3.2880	1.8740
S.E.	1.5532	1.6740	1.4203	0.8012	0.9492	0.8381
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
f = Significantly different from control group 1 at 0.01 using two-sample t-test

	MALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
THYROIDS/PARATHY (G)						
MEAN	0.0190	0.0187	0.0199	0.0200	0.0205	0.0223
S.D.	0.00175	0.00118	0.00163	0.00216	0.00168	0.00355
S.E.	0.00078	0.00034	0.00047	0.00062	0.00049	0.00159
N	5	12	12	12	12	5
THYROIDS/PARATHY (G/100 G FINAL BODY WEIGHT)						
MEAN	0.004	0.004	0.004	0.005	0.005d	0.005
S.D.	0.0004	0.0006	0.0005	0.0005	0.0006	0.0008
S.E.	0.0002	0.0002	0.0001	0.0001	0.0002	0.0004
N	5	12	12	12	12	5
THYROIDS/PARATHY (G/100 G BRAIN)						
MEAN	0.920	0.908	0.955	0.958	1.011c	1.082
S.D.	0.0676	0.0613	0.0787	0.1074	0.0840	0.1444
S.E.	0.0302	0.0177	0.0227	0.0310	0.0243	0.0646
N	5	12	12	12	12	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test

POFBSTv5.24
12/15/2010
R:01/24/2011

TABLE S63 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	FEMALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
FINAL BODY WT (G)						
MEAN	335.	313.	301.	293.	289.	295.
S.D.	25.2	23.2	30.2	23.6	24.1	31.3
S.E.	11.3	7.7	8.7	7.5	7.6	14.0
N	5	9	12	10	10	5
ADRENAL GLANDS (G)						
MEAN	0.0759	0.0759	0.0761	0.0744	0.0822	0.0849
S.D.	0.00430	0.01064	0.01160	0.00868	0.01416	0.01236
S.E.	0.00192	0.00355	0.00335	0.00275	0.00448	0.00553
N	5	9	12	10	10	5
ADRENAL GLANDS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.023	0.024	0.025	0.025	0.028	0.029f
S.D.	0.0028	0.0031	0.0034	0.0025	0.0042	0.0020
S.E.	0.0013	0.0010	0.0010	0.0008	0.0013	0.0009
N	5	9	12	10	10	5
ADRENAL GLANDS (G/100 G BRAIN)						
MEAN	3.965	3.939	3.845	3.789	4.280	4.492
S.D.	0.2737	0.5993	0.4994	0.3439	0.7230	0.4785
S.E.	0.1224	0.1998	0.1442	0.1088	0.2286	0.2140
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
f = Significantly different from control group 1 at 0.01 using two-sample t-test

	FEMALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
BRAIN (G)						
MEAN	1.92	1.93	1.97	1.96	1.92	1.88
S.D.	0.037	0.095	0.059	0.084	0.079	0.096
S.E.	0.017	0.032	0.017	0.027	0.025	0.043
N	5	9	12	10	10	5
BRAIN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.574	0.620	0.662	0.673	0.668	0.642e
S.D.	0.0411	0.0550	0.0538	0.0518	0.0513	0.0374
S.E.	0.0184	0.0183	0.0155	0.0164	0.0162	0.0167
N	5	9	12	10	10	5
HEART (G)						
MEAN	1.21	1.10	1.08	1.07	1.01	1.03
S.D.	0.227	0.095	0.103	0.109	0.129	0.132
S.E.	0.101	0.032	0.030	0.034	0.041	0.059
N	5	9	12	10	10	5
HEART (G/100 G FINAL BODY WEIGHT)						
MEAN	0.361	0.353	0.360	0.366	0.347	0.352
S.D.	0.0693	0.0190	0.0244	0.0275	0.0171	0.0384
S.E.	0.0310	0.0063	0.0070	0.0087	0.0054	0.0172
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
e = Significantly different from control group 1 at 0.05 using two-sample t-test

TABLE S63 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	FEMALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
HEART (G/100 G BRAIN)						
MEAN	62.937	57.265	54.693	54.617	52.356	54.759
S.D.	11.8685	4.9941	4.2364	5.4342	6.2101	4.8789
S.E.	5.3078	1.6647	1.2230	1.7184	1.9638	2.1819
N	5	9	12	10	10	5
KIDNEYS (G)						
MEAN	2.39	2.07b	2.11	2.05	2.17	2.10e
S.D.	0.167	0.179	0.150	0.254	0.190	0.144
S.E.	0.075	0.060	0.043	0.080	0.060	0.064
N	5	9	12	10	10	5
KIDNEYS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.714	0.662a	0.703	0.698	0.751d	0.715
S.D.	0.0516	0.0383	0.0367	0.0412	0.0569	0.0355
S.E.	0.0231	0.0128	0.0106	0.0130	0.0180	0.0159
N	5	9	12	10	10	5
KIDNEYS (G/100 G BRAIN)						
MEAN	124.645	107.298b	106.615	104.510	112.710	111.285f
S.D.	8.6478	8.4252	5.8701	12.3736	7.0430	1.9197
S.E.	3.8674	2.8084	1.6946	3.9129	2.2272	0.8585
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.

For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5; control group 1 was compared to group 6.

a = Significantly different from control group 1 at 0.05 using two-sample t-test

b = Significantly different from control group 1 at 0.01 using two-sample t-test

d = Significantly different from control group 2 at 0.01 using Dunnett's test

e = Significantly different from control group 1 at 0.05 using two-sample t-test

f = Significantly different from control group 1 at 0.01 using two-sample t-test

	FEMALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
LIVER (G)						
MEAN	13.58	11.74	12.07	13.34	17.91d	11.27e
S.D.	2.013	1.504	1.103	1.454	2.398	0.600
S.E.	0.900	0.501	0.319	0.460	0.758	0.268
N	5	9	12	10	10	5
LIVER (G/100 G FINAL BODY WEIGHT)						
MEAN	4.062	3.742	4.025	4.556d	6.174d	3.841
S.D.	0.5974	0.3104	0.2171	0.2979	0.3482	0.2060
S.E.	0.2672	0.1035	0.0627	0.0942	0.1101	0.0921
N	5	9	12	10	10	5
LIVER (G/100 G BRAIN)						
MEAN	709.301	608.941	611.456	682.112	932.466d	597.967
S.D.	107.6621	81.4621	52.0545	81.5354	117.5935	6.7786
S.E.	48.1479	27.1540	15.0268	25.7837	37.1863	3.0315
N	5	9	12	10	10	5
LUNGS (G)						
MEAN	1.36	1.40	1.26c	1.20d	1.20d	1.56
S.D.	0.126	0.131	0.123	0.120	0.071	0.394
S.E.	0.056	0.044	0.036	0.040	0.023	0.176
N	5	9	12	9	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test
e = Significantly different from control group 1 at 0.05 using two-sample t-test

TABLE S63 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	FEMALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
LUNGS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.407	0.449	0.420	0.415	0.417	0.537
S.D.	0.0385	0.0442	0.0345	0.0270	0.0173	0.1703
S.E.	0.0172	0.0147	0.0100	0.0090	0.0055	0.0762
N	5	9	12	9	10	5
LUNGS (G/100 G BRAIN)						
MEAN	70.956	72.608	63.627d	61.659d	62.705d	82.804
S.D.	6.2089	6.3629	5.0259	6.4149	4.3796	21.8567
S.E.	2.7767	2.1210	1.4508	2.1383	1.3849	9.7746
N	5	9	12	9	10	5
OVARIES/OVIDUCTS (G)						
MEAN	0.1535	0.1447	0.1413	0.1445	0.1331	0.1396
S.D.	0.01587	0.01474	0.01618	0.01463	0.01841	0.01406
S.E.	0.00710	0.00491	0.00467	0.00463	0.00582	0.00629
N	5	9	12	10	10	5
OVARIES/OVIDUCTS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.046	0.046	0.047	0.049	0.046	0.047
S.D.	0.0057	0.0041	0.0054	0.0038	0.0058	0.0016
S.E.	0.0025	0.0014	0.0016	0.0012	0.0018	0.0007
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
d = Significantly different from control group 2 at 0.01 using Dunnett's test

	FEMALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
OVARIES/OVIDUCTS (G/100 G BRAIN)						
MEAN	8.008	7.486	7.149	7.378	6.938	7.400
S.D.	0.7315	0.6151	0.6977	0.7681	0.9943	0.4235
S.E.	0.3271	0.2050	0.2014	0.2429	0.3144	0.1894
N	5	9	12	10	10	5
SPLEEN (G)						
MEAN	0.71	0.57b	0.57	0.59	0.53	0.45f
S.D.	0.115	0.033	0.099	0.144	0.077	0.050
S.E.	0.051	0.011	0.028	0.046	0.024	0.022
N	5	9	12	10	10	5
SPLEEN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.212	0.182a	0.192	0.201	0.184	0.153e
S.D.	0.0360	0.0135	0.0331	0.0525	0.0238	0.0183
S.E.	0.0161	0.0045	0.0095	0.0166	0.0075	0.0082
N	5	9	12	10	10	5
SPLEEN (G/100 G BRAIN)						
MEAN	36.971	29.467b	29.089	30.049	27.573	23.761f
S.D.	6.1507	1.1725	5.2416	7.8973	3.7843	2.2096
S.E.	2.7507	0.3908	1.5131	2.4973	1.1967	0.9882
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
a = Significantly different from control group 1 at 0.05 using two-sample t-test
b = Significantly different from control group 1 at 0.01 using two-sample t-test
e = Significantly different from control group 1 at 0.05 using two-sample t-test
f = Significantly different from control group 1 at 0.01 using two-sample t-test

FEMALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
THYMUS (G)						
MEAN	0.1856	0.1696	0.1612	0.1389	0.1179	0.1448
S.D.	0.06498	0.02943	0.06529	0.02909	0.04557	0.04422
S.E.	0.02906	0.00981	0.01885	0.00920	0.01441	0.01978
N	5	9	12	10	10	5
THYMUS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.055	0.054	0.053	0.047	0.041	0.049
S.D.	0.0188	0.0069	0.0198	0.0079	0.0145	0.0137
S.E.	0.0084	0.0023	0.0057	0.0025	0.0046	0.0061
N	5	9	12	10	10	5
THYMUS (G/100 G BRAIN)						
MEAN	9.655	8.825	8.156	7.096	6.140	7.650
S.D.	3.2761	1.7574	3.2943	1.5216	2.4112	2.1882
S.E.	1.4651	0.5858	0.9510	0.4812	0.7625	0.9786
N	5	9	12	10	10	5
THYROIDS/PARATHY (G)						
MEAN	0.0166	0.0161	0.0165	0.0167	0.0185	0.0171
S.D.	0.00305	0.00262	0.00227	0.00346	0.00215	0.00240
S.E.	0.00137	0.00087	0.00065	0.00109	0.00068	0.00107
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
None significantly different from control group

	FEMALES					
GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
THYROIDS/PARATHY (G/100 G FINAL BODY WEIGHT)						
MEAN	0.005	0.005	0.006	0.006	0.006	0.006
S.D.	0.0008	0.0007	0.0012	0.0011	0.0008	0.0008
S.E.	0.0004	0.0002	0.0003	0.0003	0.0003	0.0004
N	5	9	12	10	10	5
THYROIDS/PARATHY (G/100 G BRAIN)						
MEAN	0.863	0.834	0.838	0.851	0.964	0.910
S.D.	0.1434	0.1318	0.1180	0.1754	0.1277	0.1379
S.E.	0.0641	0.0439	0.0341	0.0555	0.0404	0.0617
N	5	9	12	10	10	5
UTERUS/VAGINA (G)						
MEAN	1.07	1.00	0.86c	0.88c	0.85c	0.98
S.D.	0.190	0.143	0.075	0.115	0.119	0.121
S.E.	0.085	0.048	0.022	0.036	0.037	0.054
N	5	9	12	10	10	5
UTERUS/VAGINA (G/100 G FINAL BODY WEIGHT)						
MEAN	0.321	0.321	0.289	0.299	0.296	0.339
S.D.	0.0714	0.0407	0.0406	0.0329	0.0369	0.0641
S.E.	0.0320	0.0136	0.0117	0.0104	0.0117	0.0287
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test

FEMALES

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
UTERUS/VAGINA (G/100 G BRAIN)						
MEAN	55.729	51.899	43.601d	44.615c	44.329d	52.464
S.D.	10.5625	6.5191	4.1338	5.3940	5.1026	7.8535
S.E.	4.7237	2.1730	1.1933	1.7057	1.6136	3.5122
N	5	9	12	10	10	5

MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test

TABLE S64 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	12	12	12	12	0
ADRENAL CORTEX						
TOTAL NUMBER EXAMINED	NA	12	12	12	12	NA
EXAMINED, UNREMARKABLE	NA	12	10	9	10	NA
-VACUOLATION, CYTOPLASMIC	NA	0	2	3	2	NA
MINIMAL	NA	NONE	2	3	2	NA
ADRENAL MEDULLA						
TOTAL NUMBER EXAMINED	NA	12	12	12	12	NA
EXAMINED, UNREMARKABLE	NA	12	12	12	12	NA
AORTA						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
BRAIN						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	11	NA
-GLIAL REST	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
CECUM						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- MALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
COAGULATING GL						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
COLON						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
DUODENUM						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
EPIDIDYMIDES						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	11	NA	NA	11	NA
-INFILTRATE, LYMPHOCYTE	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
-LUMINAL DEBRIS, CELLULAR	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
ESOPHAGUS						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	11	NA
-DEGENERATION, MUSCLE	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

TABLE S64 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
EYES						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	8	NA	NA	11	NA
-INFILTRATE, NEUTROPHIL	NA	4	NA	NA	1	NA
MINIMAL	NA	4	NA	NA	1	NA
FEMUR						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
HEART						
TOTAL NUMBER EXAMINED	NA	12	12	12	12	NA
EXAMINED, UNREMARKABLE	NA	8	5	4	4	NA
-CARDIOMYOPATHY	NA	4	7	8	8	NA
MINIMAL	NA	2	7	8+	8+	NA
MILD	NA	2	NONE	NONE	NONE	NA
-PIGMENT, BROWN	NA	0	0	1	0	NA
MINIMAL	NA	NONE	NONE	1	NONE	NA
ILEUM						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.

For statistical analyses, control group 2 was compared to groups 3, 4, and 5.

+ = Significantly different from control group 2 at 0.05 using Fisher's Exact test.

NA = NOT APPLICABLE

	----- MALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
JEJUNUM						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
KIDNEYS						
TOTAL NUMBER EXAMINED	NA	12	12	12	12	NA
EXAMINED, UNREMARKABLE	NA	7	7	1+	1+	NA
-BASOPHILIC TUBULES	NA	0	2	0	0	NA
MINIMAL	NA	NONE	2	NONE	NONE	NA
-CAST, HYALINE	NA	0	1	0	0	NA
MINIMAL	NA	NONE	1	NONE	NONE	NA
-DILATATION, PELVIS	NA	0	1	0	0	NA
MILD	NA	NONE	1	NONE	NONE	NA
-DROPLET, HYALINE	NA	0	3	10++	11++	NA
MINIMAL	NA	NONE	3	9++	9++	NA
MILD	NA	NONE	NONE	1	2	NA
-INFILTRATE, MONONUCLEAR	NA	1	0	0	1	NA
MINIMAL	NA	1	NONE	NONE	1	NA
-NEPHROPATHY, CHRONIC PROGRESSIVE	NA	4	1	4	5	NA
MINIMAL	NA	4	1	4	4	NA
MILD	NA	NONE	NONE	NONE	1	NA
-NEPHROPATHY, HYALINE DROPLET	NA	0	0	2	9++	NA
MINIMAL	NA	NONE	NONE	2	5+	NA
MILD	NA	NONE	NONE	NONE	4	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
+ = Significantly different from control group 2 at 0.05 using Fisher's Exact test.
++ = Significantly different from control group 2 at 0.01 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- MALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
LIVER						
TOTAL NUMBER EXAMINED	NA	12	12	12	12	NA
EXAMINED, UNREMARKABLE	NA	2	6	5	3	NA
-HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	NA	0	0	0	8++	NA
MINIMAL	NA	NONE	NONE	NONE	8++	NA
-INFILTRATE, MONONUCLEAR	NA	10	5	5	9	NA
MINIMAL	NA	10	5	5	9	NA
-VACUOLATION, HEPATOCELLULAR, PERIPORTAL	NA	2	1	2	0	NA
MINIMAL	NA	1	1	2	NONE	NA
MILD	NA	1	NONE	NONE	NONE	NA
LN, AXILLARY						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
LN, MANDIBULAR						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	6	NA	NA	5	NA
-PLASMACYTOSIS, MEDULLARY	NA	6	NA	NA	7	NA
MINIMAL	NA	5	NA	NA	7	NA
MILD	NA	1	NA	NA	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
++ = Significantly different from control group 2 at 0.01 using Fisher's Exact test.
NA = NOT APPLICABLE

----- MALE -----

GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
LN, MESENTERIC						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	10	NA
-ERYTHROCYTOSIS, SINUS	NA	0	NA	NA	2	NA
MINIMAL	NA	NONE	NA	NA	1	NA
MILD	NA	NONE	NA	NA	1	NA
LUNGS						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
MARROW, FEMUR						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
MARROW, STERN						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
NERVE, SCIATIC						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- MALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
NERVES, OPTIC						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
PANCREAS						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	11	NA	NA	12	NA
-INFILTRATE, LYMPHOCYTE	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
PARATHYROIDS						
TOTAL NUMBER EXAMINED	NA	10	NA	NA	11	NA
EXAMINED, UNREMARKABLE	NA	10	NA	NA	11	NA
NOT PRESENT FOR EXAMINATION	NA	2	NA	NA	1	NA
PITUITARY						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
PROSTATE						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
-INFILTRATE, LYMPHOCYTE	NA	3	NA	NA	1	NA
MINIMAL	NA	3	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

----- MALE -----

GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
PROSTATE - CONTINUED						
-INFLAMMATION, SUPPURATIVE	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
RECTUM						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
SAL. GLAND MAND						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
SEMINAL VESICLES						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
SKELETAL MUSCLE						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	11	NA	NA	10	NA
-INFILTRATE, MONONUCLEAR	NA	1	NA	NA	2	NA
MINIMAL	NA	1	NA	NA	2	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- MALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
SKIN						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	11	NA	NA	12	NA
-HYPERPLASIA, EPITHELIAL	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
SPINAL CORD						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
SPLEEN						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
STERNEBRAE						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
STOMACH, GLAN						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- MALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
STOMACH, NON						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
TESTES						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	11	NA
-DEGENERATION, SEMINIFEROUS TUBULES	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
THYMUS						
TOTAL NUMBER EXAMINED	NA	12	12	12	12	NA
EXAMINED, UNREMARKABLE	NA	12	11	9	12	NA
-HEMORRHAGE	NA	0	1	3	0	NA
MINIMAL	NA	NONE	NONE	2	NONE	NA
MILD	NA	NONE	1	1	NONE	NA
THYROID GLANDS						
TOTAL NUMBER EXAMINED	NA	12	12	12	12	NA
EXAMINED, UNREMARKABLE	NA	10	6	3+	1++	NA
-CYST, ULTIMOBRANCHIAL	NA	2	0	3	2	NA
PRESENT	NA	2	NONE	3	2	NA
-HYPERTROPHY, EPITHELIAL	NA	0	6+	9++	11++	NA
MINIMAL	NA	NONE	6+	9++	11++	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
+ = Significantly different from control group 2 at 0.05 using Fisher's Exact test.
++ = Significantly different from control group 2 at 0.01 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- MALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	12	12	12	12	NA
THYROID GLANDS - CONTINUED						
-VACUOLATION, CYTOPLASMIC	NA	0	6+	9++	10++	NA
MINIMAL	NA	NONE	6+	9++	10++	NA
TRACHEA						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA
URINARY BLADDER						
TOTAL NUMBER EXAMINED	NA	12	NA	NA	12	NA
EXAMINED, UNREMARKABLE	NA	12	NA	NA	12	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
+ = Significantly different from control group 2 at 0.05 using Fisher's Exact test.
++ = Significantly different from control group 2 at 0.01 using Fisher's Exact test.
NA = NOT APPLICABLE

TABLE S65 (F0 FEMALES - UNSCHEDULED DEATH)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
ADRENAL CORTEX						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
ADRENAL MEDULLA						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
AORTA						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
BRAIN						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
CECUM						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
CERVIX						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-INFLAMMATION, ACUTE	0	0	0	0	1	0
MINIMAL	NONE	NONE	NONE	NONE	1	NONE

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
COLON						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-INFILTRATE, MONONUCLEAR	0	0	0	0	1	0
MINIMAL	NONE	NONE	NONE	NONE	1	NONE
DUODENUM						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
ESOPHAGUS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
EYES						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
FEMUR						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
HEART						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
ILEUM						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-INFILTRATE, MONONUCLEAR	0	0	0	0	1	0
MINIMAL	NONE	NONE	NONE	NONE	1	NONE
JEJUNUM						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
KIDNEYS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-DILATATION, TUBULAR	0	0	0	0	1	0
MODERATE	NONE	NONE	NONE	NONE	1	NONE
LIVER						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	0	0	0	0	1	0
MINIMAL	NONE	NONE	NONE	NONE	1	NONE

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
LIVER - CONTINUED						
-NECROSIS, COAGULATIVE	0	0	0	0	1	0
MILD	NONE	NONE	NONE	NONE	1	NONE
-VACUOLATION, HEPATOCELLULAR	0	0	0	0	1	0
MILD	NONE	NONE	NONE	NONE	1	NONE
LN, AXILLARY						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
LN, MANDIBULAR						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
LN, MESENTERIC						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
LUNGS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S65 (F0 FEMALES - UNSCHEDULED DEATH)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
MAMMARY GLAND						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-HYPERPLASIA, PHYSIOLOGIC	0	0	0	0	1	0
MILD	NONE	NONE	NONE	NONE	1	NONE
MARROW, FEMUR						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-HYPOCELLULAR	0	0	0	0	1	0
MINIMAL	NONE	NONE	NONE	NONE	1	NONE
MARROW, STERN						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-HYPOCELLULAR	0	0	0	0	1	0
MINIMAL	NONE	NONE	NONE	NONE	1	NONE
NERVE, SCIATIC						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
NERVES, OPTIC						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
OVARIES						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
OVIDUCTS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
PANCREAS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
PARATHYROIDS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
PITUITARY						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
RECTUM						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
SAL. GLAND MAND						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
SKELETAL MUSCLE						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
SKIN						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
SPINAL CORD						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
SPLEEN						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-CONTRACTED	0	0	0	0	1	0
PRESENT	NONE	NONE	NONE	NONE	1	NONE

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
SPLEEN - CONTINUED						
-DEPLETION	0	0	0	0	1	0
MODERATE	NONE	NONE	NONE	NONE	1	NONE
STERNEBRAE						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
STOMACH, GLAN						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-NECROSIS	0	0	0	0	1	0
MINIMAL	NONE	NONE	NONE	NONE	1	NONE
STOMACH, NON						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
THYMUS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-DEPLETION, LYMPHOID, CORTEX	0	0	0	0	1	0
SEVERE	NONE	NONE	NONE	NONE	1	NONE

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
THYROID GLANDS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
TRACHEA						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
URINARY BLADDER						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	1	0
UTERUS						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-INFLAMMATION, ACUTE	0	0	0	0	1	0
MILD	NONE	NONE	NONE	NONE	1	NONE
-INVOLUTION	0	0	0	0	1	0
PRESENT	NONE	NONE	NONE	NONE	1	NONE
VAGINA						
TOTAL NUMBER EXAMINED	0	0	0	0	1	0
EXAMINED, UNREMARKABLE	0	0	0	0	0	0
-ESTROUS CYCLE: ANESTRUS, LACTATIONAL	0	0	0	0	1	0
PRESENT	NONE	NONE	NONE	NONE	1	NONE

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S66 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	3	0	2	0	0
ADRENAL CORTEX						
TOTAL NUMBER EXAMINED	NA	3	0	2	0	NA
EXAMINED, UNREMARKABLE	NA	3	0	2	0	NA
ADRENAL MEDULLA						
TOTAL NUMBER EXAMINED	NA	3	0	2	0	NA
EXAMINED, UNREMARKABLE	NA	3	0	2	0	NA
AORTA						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
BRAIN						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
CECUM						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
CERVIX						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	2	NA	NA	0	NA
-DILATATION	NA	1	NA	NA	0	NA
MILD	NA	1	NA	NA	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NA = NOT APPLICABLE

TABLE S66 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	NA	2	0	NA
CERVIX - CONTINUED						
COLON						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
DUODENUM						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
ESOPHAGUS						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
EYES						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
FEMUR						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NA = NOT APPLICABLE

TABLE S66 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	0	2	0	NA
HEART						
TOTAL NUMBER EXAMINED	NA	3	0	2	0	NA
EXAMINED, UNREMARKABLE	NA	3	0	2	0	NA
ILEUM						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
JEJUNUM						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
KIDNEYS						
TOTAL NUMBER EXAMINED	NA	3	0	2	0	NA
EXAMINED, UNREMARKABLE	NA	2	0	1	0	NA
-INFILTRATE, MONONUCLEAR	NA	1	0	0	0	NA
MINIMAL	NA	1	NONE	NONE	NONE	NA
-MINERALIZATION	NA	1	0	1	0	NA
MINIMAL	NA	1	NONE	1	NONE	NA
LIVER						
TOTAL NUMBER EXAMINED	NA	3	0	2	0	NA
EXAMINED, UNREMARKABLE	NA	3	0	1	0	NA
-INFILTRATE, MONONUCLEAR	NA	0	0	1	0	NA
MINIMAL	NA	NONE	NONE	1	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	0	2	0	NA
LIVER - CONTINUED						
LN, AXILLARY						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
LN, MANDIBULAR						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	1	NA	NA	0	NA
-PLASMACYTOSIS, MEDULLARY	NA	2	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
MILD	NA	1	NA	NA	NONE	NA
LN, MESENTERIC						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
LUNGS						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
MAMMARY GLAND						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

TABLE S66 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	NA	2	0	NA
MARROW, FEMUR						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
MARROW, STERN						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
NERVE, SCIATIC						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
NERVES, OPTIC						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
OVARIES						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	2	NA	NA	0	NA
-MINERALIZATION	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NA = NOT APPLICABLE

TABLE S66 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	NA	2	0	NA
OVIDUCTS						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
PANCREAS						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	2	NA	NA	0	NA
-INFILTRATE, LYMPHOCYTE	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
PARATHYROIDS						
TOTAL NUMBER EXAMINED	NA	1	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	1	NA	NA	0	NA
NOT PRESENT FOR EXAMINATION	NA	2	NA	NA	0	NA
PITUITARY						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
RECTUM						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NA = NOT APPLICABLE

TABLE S66 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	NA	2	0	NA
SAL. GLAND MAND						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
SKELETAL MUSCLE						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	2	NA	NA	0	NA
-INFILTRATE, MONONUCLEAR	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
SKIN						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
SPINAL CORD						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
SPLEEN						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	NA	2	0	NA
STERNEBRAE						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
STOMACH, GLAN						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
STOMACH, NON						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
THYMUS						
TOTAL NUMBER EXAMINED	NA	3	0	2	0	NA
EXAMINED, UNREMARKABLE	NA	3	0	2	0	NA
THYROID GLANDS						
TOTAL NUMBER EXAMINED	NA	3	0	2	0	NA
EXAMINED, UNREMARKABLE	NA	1	0	0	0	NA
-CYST, ULTIMOBRANCHIAL	NA	2	0	0	0	NA
PRESENT	NA	2	NONE	NONE	NONE	NA
-HYPERTROPHY, EPITHELIAL	NA	0	0	1	0	NA
MINIMAL	NA	NONE	NONE	1	NONE	NA
-VACUOLATION, CYTOPLASMIC	NA	0	0	2	0	NA
MINIMAL	NA	NONE	NONE	2	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	3	NA	2	0	NA
TRACHEA						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
URINARY BLADDER						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA
UTERUS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
NOT PRESENT FOR EXAMINATION	NA	3	NA	NA	0	NA
VAGINA						
TOTAL NUMBER EXAMINED	NA	3	NA	NA	0	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	0	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

TABLE S67 (F0 FEMALES - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	0	0	0	1	0
ADRENAL CORTEX						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
ADRENAL MEDULLA						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
AORTA						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
BRAIN						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
CECUM						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
CERVIX						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
COLON						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
DUODENUM						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
ESOPHAGUS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
EYES						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
FEMUR						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
HEART						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-CARDIOMYOPATHY	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
ILEUM						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
JEJUNUM						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
KIDNEYS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
LIVER						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
-INFILTRATE, MONONUCLEAR	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
-VACUOLATION, HEPATOCELLULAR, PERIPORTAL	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
LN, AXILLARY						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
LN, MANDIBULAR						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-PLASMACYTOSIS, MEDULLARY	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
LN, MESENTERIC						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
LUNGS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-MACROPHAGES, ALVEOLAR	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
MAMMARY GLAND						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-HYPERPLASIA, PHYSIOLOGIC	NA	0	NA	NA	1	NA
MILD	NA	NONE	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
MARROW, FEMUR						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
MARROW, STERN						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
NERVE, SCIATIC						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
NERVES, OPTIC						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
OVARIES						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
OVIDUCTS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
PANCREAS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
PARATHYROIDS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
PITUITARY						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-CYST, PARS DISTALIS	NA	0	NA	NA	1	NA
PRESENT	NA	NONE	NA	NA	1	NA
RECTUM						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
SAL. GLAND MAND						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
SKELETAL MUSCLE						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
SKIN						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
SPINAL CORD						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
SPLEEN						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-HEMATOPOIESIS, EXTRAMEDULLARY, INCREASED	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
STERNEBRAE						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
STOMACH, GLAN						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
STOMACH, NON						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
THYMUS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-DEPLETION, LYMPHOID, CORTEX	NA	0	NA	NA	1	NA
MILD	NA	NONE	NA	NA	1	NA
THYROID GLANDS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-HYPERTROPHY, EPITHELIAL	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
-VACUOLATION, CYTOPLASMIC	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	0	NA	NA	1	NA
TRACHEA						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
URINARY BLADDER						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	1	NA
UTERUS						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-INVOLUTION	NA	0	NA	NA	1	NA
PRESENT	NA	NONE	NA	NA	1	NA
VAGINA						
TOTAL NUMBER EXAMINED	NA	0	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-ESTROUS CYCLE: ANESTRUS, LACTATIONAL	NA	0	NA	NA	1	NA
PRESENT	NA	NONE	NA	NA	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	0	9	12	10	10	0
ADRENAL CORTEX						
TOTAL NUMBER EXAMINED	NA	9	12	10	10	NA
EXAMINED, UNREMARKABLE	NA	9	12	10	8	NA
-VACUOLATION, CYTOPLASMIC	NA	0	0	0	2	NA
MINIMAL	NA	NONE	NONE	NONE	1	NA
MILD	NA	NONE	NONE	NONE	1	NA
ADRENAL MEDULLA						
TOTAL NUMBER EXAMINED	NA	9	12	10	10	NA
EXAMINED, UNREMARKABLE	NA	9	12	10	10	NA
AORTA						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
BRAIN						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
CECUM						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	8	NA	NA	10	NA
-INFILTRATE, NEUTROPHIL	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
CERVIX						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
COLON						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
DUODENUM						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
ESOPHAGUS						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	9	NA
-DEGENERATION, MUSCLE	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
EYES						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

----- FEMALE -----

GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
FEMUR						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
HEART						
TOTAL NUMBER EXAMINED	NA	9	12	10	10	NA
EXAMINED, UNREMARKABLE	NA	6	9	8	6	NA
-CARDIOMYOPATHY	NA	3	3	2	4	NA
MINIMAL	NA	3	3	2	4	NA
ILEUM						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
JEJUNUM						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
KIDNEYS						
TOTAL NUMBER EXAMINED	NA	9	12	10	10	NA
EXAMINED, UNREMARKABLE	NA	4	5	2	3	NA
-CYST	NA	1	0	0	0	NA
PRESENT	NA	1	NONE	NONE	NONE	NA
-DILATATION, TUBULAR	NA	0	0	0	1	NA
MINIMAL	NA	NONE	NONE	NONE	1	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

----- FEMALE -----

GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
KIDNEYS - CONTINUED						
-INFILTRATE, MONONUCLEAR	NA	0	0	0	1	NA
MILD	NA	NONE	NONE	NONE	1	NA
-MINERALIZATION	NA	4	6	8	7	NA
MINIMAL	NA	3	6	7	6	NA
MILD	NA	1	NONE	1	1	NA
-NEPHROPATHY, CHRONIC PROGRESSIVE	NA	3	2	2	1	NA
MINIMAL	NA	3	2	2	1	NA
LIVER						
TOTAL NUMBER EXAMINED	NA	9	12	10	10	NA
EXAMINED, UNREMARKABLE	NA	8	8	6	0++	NA
-HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	NA	0	0	0	10++	NA
MINIMAL	NA	NONE	NONE	NONE	10++	NA
-INFILTRATE, MONONUCLEAR	NA	1	3	4	3	NA
MINIMAL	NA	1	3	4	3	NA
-NECROSIS, COAGULATIVE	NA	0	0	0	1	NA
MINIMAL	NA	NONE	NONE	NONE	1	NA
-VACUOLATION, HEPATOCELLULAR, PERIPORTAL	NA	0	1	0	2	NA
MINIMAL	NA	NONE	1	NONE	2	NA
LN, AXILLARY						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
++ = Significantly different from control group 2 at 0.01 using Fisher's Exact test.
NA = NOT APPLICABLE

TABLE S68 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MICROSCOPIC FINDINGS

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
LN, MANDIBULAR						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-PLASMACYTOSIS, MEDULLARY	NA	9	NA	NA	10	NA
MINIMAL	NA	2	NA	NA	2	NA
MILD	NA	7	NA	NA	8	NA
LN, MESENTERIC						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	8	NA
-PLASMACYTOSIS, MEDULLARY	NA	0	NA	NA	2	NA
MINIMAL	NA	NONE	NA	NA	2	NA
LUNGS						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	8	NA	NA	9	NA
-INFILTRATE, EOSINOPHIL, PERIVASCULAR	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
-MACROPHAGES, ALVEOLAR	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
MAMMARY GLAND						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-HYPERPLASIA, PHYSIOLOGIC	NA	9	NA	NA	10	NA
MILD	NA	8	NA	NA	10	NA
MODERATE	NA	1	NA	NA	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
MARROW, FEMUR						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
MARROW, STERN						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
NERVE, SCIATIC						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
NERVES, OPTIC						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	9	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	9	NA
NOT PRESENT FOR EXAMINATION	NA	0	NA	NA	1	NA
OVARIES						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
OVIDUCTS						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

----- FEMALE -----

GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
PANCREAS						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	8	NA	NA	10	NA
-INFILTRATE, LYMPHOCYTE	NA	1	NA	NA	0	NA
MINIMAL	NA	1	NA	NA	NONE	NA
PARATHYROIDS						
TOTAL NUMBER EXAMINED	NA	8	NA	NA	7	NA
EXAMINED, UNREMARKABLE	NA	8	NA	NA	7	NA
NOT PRESENT FOR EXAMINATION	NA	1	NA	NA	3	NA
PITUITARY						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	8	NA	NA	10	NA
-CYST, PARS INTERMEDIA	NA	1	NA	NA	0	NA
PRESENT	NA	1	NA	NA	NONE	NA
RECTUM						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
SAL. GLAND MAND						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
SKELETAL MUSCLE						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
SKIN						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	9	NA
-HYPERPLASIA, EPITHELIAL	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
SPINAL CORD						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
SPLEEN						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	9	NA
-HEMATOPOIESIS, EXTRAMEDULLARY, INCREASED	NA	0	NA	NA	1	NA
MINIMAL	NA	NONE	NA	NA	1	NA
STERNEBRAE						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
None significantly different from control group 2 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
STOMACH, GLAN						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
STOMACH, NON						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
THYMUS						
TOTAL NUMBER EXAMINED	NA	9	12	10	10	NA
EXAMINED, UNREMARKABLE	NA	8	11	10	5	NA
-DEPLETION, LYMPHOID, CORTEX	NA	0	1	0	5+	NA
MINIMAL	NA	NONE	1	NONE	4	NA
MILD	NA	NONE	NONE	NONE	1	NA
-HEMORRHAGE	NA	1	0	0	0	NA
MILD	NA	1	NONE	NONE	NONE	NA
THYROID GLANDS						
TOTAL NUMBER EXAMINED	NA	9	12	10	10	NA
EXAMINED, UNREMARKABLE	NA	5	6	4	1	NA
-CYST, ULTIMOBRANCHIAL	NA	4	3	3	4	NA
PRESENT	NA	4	3	3	4	NA
-ECTOPIC THYMUS	NA	0	0	1	0	NA
PRESENT	NA	NONE	NONE	1	NONE	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
+ = Significantly different from control group 2 at 0.05 using Fisher's Exact test.
NA = NOT APPLICABLE

	----- FEMALE -----					
GROUP:	1	2	3	4	5	6
NUMBER OF ANIMALS EXAMINED	NA	9	12	10	10	NA
THYROID GLANDS - CONTINUED						
-HYPERTROPHY, EPITHELIAL	NA	0	3	4	8++	NA
MINIMAL	NA	NONE	3	4	6+	NA
MILD	NA	NONE	NONE	NONE	2	NA
-VACUOLATION, CYTOPLASMIC	NA	0	3	4	8++	NA
MINIMAL	NA	NONE	3	4	8++	NA
TRACHEA						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
URINARY BLADDER						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	9	NA	NA	10	NA
UTERUS						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	3	NA	NA	2	NA
-INVOLUTION	NA	6	NA	NA	8	NA
PRESENT	NA	6	NA	NA	8	NA
VAGINA						
TOTAL NUMBER EXAMINED	NA	9	NA	NA	10	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA	0	NA
-ESTROUS CYCLE: ANESTRUS, LACTATIONAL	NA	9	NA	NA	10	NA
PRESENT	NA	9	NA	NA	10	NA

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
MODIFIED STATISTICS USED.
For statistical analyses, control group 2 was compared to groups 3, 4, and 5.
+ = Significantly different from control group 2 at 0.05 using Fisher's Exact test.
++ = Significantly different from control group 2 at 0.01 using Fisher's Exact test.
NA = NOT APPLICABLE

TABLE S69 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM SUMMARY OF PND 0 LITTER DATA

GROUP :	1	2	3	4	5	6
NUMBER BORN						
MEAN	14.6	14.1	12.9	12.0	10.8d	12.4f
S.D.	1.14	1.90	1.08	1.56	3.79	0.89
S.E.	0.51	0.63	0.31	0.49	1.09	0.40
N	5	9	12	10	12	5
SEX AT BIRTH (% MALES PER LITTER)						
MEAN	60.0	58.9	53.9	55.2	58.1	49.6
S.D.	6.66	9.58	10.08	19.08	22.70	17.11
S.E.	2.98	3.19	2.91	6.03	6.55	7.65
N	5	9	12	10	12	5
LIVE LITTER SIZE (PND 0)						
MEAN	13.4	13.9	12.9	10.1c	9.6d	12.2
S.D.	1.52	1.90	1.08	4.04	3.99	0.84
S.E.	0.68	0.63	0.31	1.28	1.15	0.37
N	5	9	12	10	12	5

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC
SEX COMPARED USING DUNN'S TEST, NUMBER BORN, AND LIVE LITTER SIZE COMPARED USING DUNNETT'S OR TWO-SAMPLE T-TEST
MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05
d = Significantly different from control group 2 at 0.01
f = Significantly different from control group 1 at 0.01

PPVIASv5.10
12/15/2010
R:01/20/2011

TABLE S70 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF POSTNATAL SURVIVAL [% PER LITTER]

GROUP :	1	2	3	4	5	6
PND 0 (RELATIVE TO NUMBER BORN)						
MEAN	97.1	99.3	100.0	90.2	90.1	100.0
S.D.	6.39	2.22	0.00	24.96	21.13	0.00
S.E.	2.86	0.74	0.00	7.89	6.10	0.00
N	5	9	12	10	12	5
PND 0 TO PND 1						
MEAN	100.0	98.9	100.0	99.2	78.9	100.0
S.D.	0.00	3.33	0.00	2.64	31.76	0.00
S.E.	0.00	1.11	0.00	0.83	9.17	0.00
N	5	9	12	10	12	5
PND 1 TO PND 4						
MEAN	87.0	100.0	100.0	98.6	82.6	100.0
S.D.	18.57	0.00	0.00	3.04	34.25	0.00
S.E.	8.31	0.00	0.00	0.96	10.33	0.00
N	5	9	12	10	11	5
BIRTH TO PND 4						
MEAN	84.1	98.1	100.0	88.0	67.7	100.0
S.D.	17.12	3.77	0.00	24.51	40.65	0.00
S.E.	7.65	1.26	0.00	7.75	11.73	0.00
N	5	9	12	10	12	5

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

STATISTICS PERFORMED USING DUNN'S TEST

MODIFIED STATISTICS USED.

For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5; control group 1 was compared to group 6.

None significantly different from control group

PPVIASv5.10
12/15/2010
R:01/20/2011

TABLE S71 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF PUPS

CATEGORY / FINDING	GROUP:	1	2	3	4	5	6
NORMAL							
NO SIGNIFICANT CLINICAL OBSERVATIONS		131/ 71	249/125	307/155	214/108	141/ 73	124/ 62
	LITTERS:	5	9	12	10	9	5
DISPOSITION							
FOUND DEAD; PARTIALLY CANNIBALIZED		1/ 1	0/ 0	0/ 0	3/ 3	5/ 5	0/ 0
	LITTERS:	1	0	0	1	2	0
FOUND DEAD		5/ 5	1/ 1	0/ 0	8/ 8	33/ 33	0/ 0
	LITTERS:	2	1	0	4	8	0
EUTHANIZED IN EXTREMIS; PARTIALLY CANNIBALIZED		0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
SCHEDULED EUTHANASIA		61/ 61	125/125	155/155	107/107	82/ 82	62/ 62
	LITTERS:	5	9	12	10	10	5
MISSING		6/ 6	1/ 1	0/ 0	1/ 1	9/ 9	0/ 0
	LITTERS:	2	1	0	1	5	0
BODY/INTEGUMENT							
SCABBING RIGHT LATERAL ABDOMINAL AREA		0/ 0	2/ 1	0/ 0	0/ 0	0/ 0	0/ 0
	LITTERS:	0	1	0	0	0	0
BODY PALE		1/ 1	1/ 1	2/ 2	1/ 1	2/ 2	0/ 0
	LITTERS:	1	1	2	1	2	0
BODY COOL		0/ 0	1/ 1	0/ 0	1/ 1	39/ 25	0/ 0
	LITTERS:	0	1	0	1	3	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

CATEGORY / FINDING	GROUP:	1	2	3	4	5	6
LACERATION LEFT FORELIMB		0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
LEFT FORELIMB MISSING		0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
WET RED MATERIAL LEFT FORELIMB		0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
SMALL STATURE		0/ 0	0/ 0	0/ 0	2/ 2	4/ 4	0/ 0
	LITTERS:	0	0	0	2	1	0
LACERATION LEFT HINDLIMB		0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
WET RED MATERIAL LEFT HINDLIMB		0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
SUBCUTANEOUS HEMORRHAGE DORSAL HEAD		1/ 1	0/ 0	1/ 1	0/ 0	1/ 1	0/ 0
	LITTERS:	1	0	1	0	1	0
SWOLLEN LEFT HINDLIMB		0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
SCABBING LEFT HINDLIMB		0/ 0	0/ 0	0/ 0	2/ 1	0/ 0	0/ 0
	LITTERS:	0	0	0	1	0	0
CARDIO-PULMONARY							
GASPING		0/ 0	0/ 0	0/ 0	1/ 1	1/ 1	0/ 0
	LITTERS:	0	0	0	1	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE S72 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 1

SPONSOR:AMERICAN PETROLEUM SUMMARY OF OFFSPRING WEIGHTS [G]

(LITTER AS EXPERIMENTAL UNIT)

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
PND 1						
MALES						
MEAN	6.8	7.0	6.7	6.7	5.7d	6.6
S.D.	1.10	0.51	0.65	0.48	0.76	0.29
S.E.	0.49	0.17	0.19	0.15	0.24	0.13
N	5	9	12	10	10	5
FEMALES						
MEAN	6.5	6.6	6.5	6.4	5.6c	6.3
S.D.	1.25	0.57	0.57	0.39	1.13	0.43
S.E.	0.56	0.19	0.16	0.13	0.36	0.19
N	5	9	12	9	10	5
PND 4						
MALES						
MEAN	9.0	9.7	9.4	9.4	7.2d	8.9
S.D.	1.67	1.08	1.20	0.90	1.54	0.93
S.E.	0.75	0.36	0.35	0.28	0.51	0.42
N	5	9	12	10	9	5
FEMALES						
MEAN	8.7	9.1	9.0	8.8	7.3d	8.5
S.D.	1.69	1.04	1.04	0.68	1.46	1.13
S.E.	0.76	0.35	0.30	0.23	0.49	0.50
N	5	9	12	9	9	5

PND = POSTNATAL DAY
MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
c = Significantly different from control group 2 at 0.05 using Dunnett's test
d = Significantly different from control group 2 at 0.01 using Dunnett's test

PPWSUSNv5.17
12/15/2010
R:01/20/2011

TABLE S73 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF OFFSPRING WEIGHT CHANGES [G]

(LITTER AS EXPERIMENTAL UNIT)

GROUP:	SHAM CONTROL	0 MG/KG	100 MG/KG	300 MG/KG	900 MG/KG	60 MG/KG CYC
PND 1 TO 4						
MALES						
MEAN	2.1	2.7	2.7	2.7	1.4d	2.3
S.D.	0.75	0.60	0.60	0.70	1.07	0.71
S.E.	0.33	0.20	0.17	0.22	0.36	0.32
N	5	9	12	10	9	5
FEMALES						
MEAN	2.2	2.6	2.6	2.5	1.4d	2.2
S.D.	0.60	0.57	0.55	0.66	0.95	0.74
S.E.	0.27	0.19	0.16	0.22	0.32	0.33
N	5	9	12	9	9	5

PND = POSTNATAL DAY
MODIFIED STATISTICS USED.
For statistical analyses, control group 1 was compared to group 2; control group 2 was compared to groups 3, 4 and 5;
control group 1 was compared to group 6.
d = Significantly different from control group 2 at 0.01 using Dunnett's test

PPWSUSNv5.17
12/15/2010
R:01/20/2011

TABLE S74 (F1 - UNSCHEDULED DEATHS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM SUMMARY OF PUP NECROPSY FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	PUPS						LITTERS					
DOSE GROUP:	1	2	3	4	5	6	1	2	3	4	5	6
NUMBER EXAMINED VISCERALLY	6	1	0	12	38	0	2	1	0	5	8	0
BONE												
FRACTURED	0	0	0	0	1	0	0	0	0	0	1	0
LUNGS												
DID NOT FLOAT	2	1	0	5	9	0	1	1	0	2	4	0
DID FLOAT	0	0	0	1	15	0	0	0	0	1	7	0
STOMACH												
MILK NOT PRESENT	2	1	0	4	18	0	1	1	0	2	7	0
MILK PRESENT	0	0	0	1	0	0	0	0	0	1	0	0
KIDNEY												
RENAL PAPILLA(E) NOT FULLY DEVELOPED (WOO AND HOAR GRADE 1)	0	0	0	0	1	0	0	0	0	0	1	0

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

FINAL REPORT

Contents:	Volume 2 of 6 (Appendices A-K)
Study Title:	A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats
Laboratory Project ID:	WIL-402011
Author:	[redacted]
Test Guideline:	U.S. EPA OPPTS 870.3650 and 870.5395, ICH Guideline S2A and S2B, and OECD Guidelines 422 and 474
Study Completion Date:	30 August 2012
Performing Laboratory:	WIL Research Laboratories, LLC 1407 George Road Ashland, OH 44805-8946
Sponsor:	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
Total Number of Pages:	1897

APPENDIX A

Study Protocol and Deviations

DEVIATIONS FROM THE PROTOCOL

This study was conducted in accordance with the protocol and protocol amendments, except for the following.

- **Protocol Section 7.10.1** states that during the treatment period, each animal would be observed at approximately 1 hour following each dose administration. Post-dosing observations were not recorded for animals assigned to the positive control group (Group 6) at approximately 1 hour following administration of cyclophosphamide.

  Reason for Deviation: After discussion with the Study Director, it was decided that a post-dosing observation was not needed for these animals.

- **Protocol Section 7.10.4** states that all males and females would be evaluated for locomotor activity once prior to dosing and following approximately 28 days of dose administration for males and prior to termination for females. Males and females in the sham and positive control groups (Groups 1 and 6, respectively) were not evaluated for locomotor activity.

  Reason for Deviation: Locomotor activity assessments were not necessary for these control groups.

- **Protocol Section 8.3.1** states that moribund pups would be euthanized by an intraperitoneal injection of sodium pentobarbital. On PND 0, pup no. 1 from dam no. 81931 in the 300 mg/kg/day group was euthanized *in extremis* by a subcutaneous injection of sodium pentobarbital.

  Reason for Deviation: Technician error.

- **Protocol Section 8.4.1** states that the lungs would be weighed prior to inflation with fixative. On lactation day 4, the lungs for female no. 81934 in the 300 mg/kg/day group were inflated with fixative prior to weighing. This data was not tabulated with other lung weights

  Reason for Deviation: Technician error.

These deviations did not negatively impact the quality or integrity of the data nor the outcome of the study.

PROTOCOL AMENDMENT 5

Study Number: WIL-402011

Sponsor: American Petroleum Institute

Title of Study:

A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats

Protocol Modifications:

1) **2.1 Sponsor Representative:**

   The Sponsor Representative is changed to:

   [redacted]
   American Petroleum Institute
   1220 L Street, NW
   Washington, DC 20005
   Tel: (202) 682-8344
   Email: [redacted]

2) **14 Work Product:**

   Prior to finalization, any remaining materials at Midwest BioResearch to be archived will be sent to WIL Research Archives for archiving.

Reasons for Protocol Modification:

1) To change the Sponsor Representative.

2) To clarify archiving of materials at the performing laboratory.

Approval:

Sponsor approval received via email on 05 July 2012.
Date

WIL Research

[redacted]
Study Director

06 July 2012
Date

American Petroleum Institute

[redacted]
Sponsor Representative

06 July 2012
Date

Study Number: WIL-402011

PROTOCOL AMENDMENT 4

Sponsor: American Petroleum Institute

Title of Study:

A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study With The Reproduction/Developmental Toxicity Screening Test Of Naphthenic Acid With A Mammalian Erythrocyte Micronucleus Test In Rats

Protocol Modifications:

1) **2.2 WIL Study Director:**

The Study Director is changed as follows:

[redacted]
Staff Toxicologist, Developmental
and Reproductive Toxicology
Tel: (419) 289-8700
Fax: (419) 289-3650
Email: [redacted]

Reasons for Protocol Modification:

1) [redacted] will be leaving WIL Research prior to the conclusion of this study.

Approval:

Sponsor's approval was obtained via email on 7/28/11.

WIL Research Laboratories, LLC

Incoming Study Director:

[redacted]

Study Director

7/29/11
Date

Outgoing Study Director:

[redacted]

Study Director

29 July 2011
Date

[redacted]

Senior Director, Developmental and
Reproductive Toxicology

1 Aug 2011
Date

American Petroleum Institute

[redacted]

Sponsor Representative

26 July 2012
Date

* [redacted] was unavailable to sign. ①

① Sponsor footnote not initialed and dated 1HC 01Aug2012

Approval:

Sponsor's approval was obtained via email on 7/28/11.

WIL Research Laboratories, LLC

Incoming Study Director:

[redacted]

7/29/11
Date

Study Director

Outgoing Study Director:

[redacted]

29 July 2011
Date

Study Director

[redacted]

1 Aug 2011
Date

Senior Director, Developmental and
Reproductive Toxicology

American Petroleum Institute

[redacted]

Date

Sponsor Representative

Study Number: WIL-402011

PROTOCOL AMENDMENT 3

Sponsor: **American Petroleum Institute**

Title of Study:

A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats

Protocol Modifications:

1) **8.4.4 Microscopic Examination:**

   In accordance with Study Director Notification from A-186 dated January 20, 2011, the following is added to the protocol:

   Microscopic examination is extended to low- and mid-dose groups due to finding in the high-dose groups in the target tissues. These target tissues include liver, kidneys, thymus, adrenals, thyroids, and heart.

2) **11 Statistical Methods:**

   In accordance with Study Director Notification from A-186 dated January 21, 2011, the following is added to the protocol:

   All available in-life, litter, and organ weight data collected for the positive control group (group 6) will be compared to the sham control group (group 1) by a two-sample t-test. Additionally, all available in-life, litter, and organ weight data collected from the vehicle control group (group 2) will be compared to the sham control group (group 1) by a two-sample t-test.

Reasons for Protocol Modification:

1) Microscopic evaluation is extended to low- and mid-dose groups in target tissues to determine a dose response following microscopic findings in the high-dose group.

2) Corrects statistical comparisons.

Approval:

Sponsor's approval was obtained via email on 02/01/2011.

WIL Research Laboratories, LLC

[redacted] 16 March 2011
Study Director Date

[redacted] 16 Mar 2011
Senior Director, Developmental and Reproductive Toxicology Date

American Petroleum Institute

[redacted] 17-March-2011
Sponsor Representative Date

Departmental/Study Director Notification

Study Director: [redacted]

Study No.: WIL-**402011**

Please note the following:

8.4.4 Microscopic Evaluation:

Microscopic examination in is extented to low- and mid-dose groups due to findings at the high-dose groups in the target tissues. Target tissues include liver, kidneys, thymus, adrenals, thyroids, and heart.

Reason for change:

Microscopic evaluation is extended to low and mid-dose groups in target tissues to determine a dose response following micrscopic findings in the the high-dose group.

Sponsor approval on: 01/20/11 via Email or NA

■ **Protocol amendment forthcoming**

☐ **Clarification of procedure, no protocol amendment required**

Study Director: [redacted] **Date:** 1/20/11

Original: QAU
Copies as per protocol distribution

A-186-9

Departmental/Study Director Notification

Study Director: [redacted]

Study No.: WIL-**402011**

Please note the following:

Section 11 Statistics:

All available in-life, litter, and organ weight data collected for the positive control group (group 6) will be compared to the sham control group (group 1) by a two-sample t-test. Additionally, all available in-life, litter, and organ weight data collected from the vehicle control group (group 2) will be compared to the sham control group (group 1) by a two-sample t-test.

Reason for change:

Clarifies statistics comparisons.

Sponsor approval on: 1/20/11 via email or___ NA _____

■ **Protocol amendment forthcoming**

☐ **Clarification of procedure, no protocol amendment required**

Study Director: [redacted] **Date:** 1/21/11

Original: QAU
Copies as per protocol distribution

A-186-9

Study Number: WIL-402011

PROTOCOL AMENDMENT 2

Sponsor: American Petroleum Institute

Title of Study:

A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study With The Reproduction/Developmental Toxicity Screening Test Of Naphthenic Acid With A Mammalian Erythrocyte Micronucleus Test In Rats

Protocol Modifications:

1) **8.4.2 Bone Marrow Collection:**

   In accordance with Study Director Notification form A-186 dated October 14, 2010, the first sentence is replaced with the following:

   All animals at scheduled necropsy and euthanized in extremis from all groups (with the exception of found dead and vehicle control animals euthanized in extremis) will have bone marrow collected as described below.

2) **9 Micronucleus Test:**

   In accordance with Study Director Notification form A-186 dated October 14, 2010, the following is added:

   The slides from the first five animals of each sex listed in the necropsy schedule for the study termination (including those euthanized in extremis or at the scheduled necropsy of females which fail to deliver, with a total litter loss or on lactation day 4 for those females that deliver) will be analyzed by Midwest BioResearch for the potential of the test article to induce micronuclei in polychromatic erythrocytes in rat bone marrow. Vehicle control (Group 2) animals that are euthanized in extremis will not have their bone marrow collected. The remaining slides will be retained for potential future analysis. The bone marrow will be collected as described previously.

Reasons for Protocol Modification:

1-2) Bone marrow will be collected from all animals on study (with the exception of found dead and vehicle control animals euthanized in extremis). Only the first five animals to receive a necropsy will have the slides analyzed in the micronucleus test.

Approval:

Sponsor's approval was obtained via mail on 11/15/10.

WIL Research Laboratories, LLC

[redacted]
Study Director — 15 Nov 2010 Date

[redacted]
Senior Director, Developmental and Reproductive Toxicology — 15 Nov 2010 Date

American Petroleum Institute

[redacted]
Sponsor Representative — 16 Nov 2010 Date

Departmental/Study Director Notification

Study Director: [redacted]

Study No.: WIL-402011

Please note the following:

8.4.2 Bone Marrow Collection:

The first sentence is replaced with the following:

① (With the exception of found dead and vehicle/positive control animals euthanized in extremis)

All animals at scheduled necropsy and euthanized in extremis from all groups will have bone marrow collected as described below.

9 Micronucleus Test:

The following is added to the protocol:

The slides from the first five animals to be necropsied (including those euthanized in extremis or at the scheduled necropsy of female which fail to deliver, with a total litter loss or on lactation day 4 for those females that deliver) will be analyzed by Midwest BioResearch for the potential of the test article to induce micronuclei in polychromatic erythrocytes in rat bone marrow. Vehicle control (group 2) animals that are euthanized in extremis will not have their bone marrow collected. The remaining slides may be will be retained for potential future analysis. The bone marrow will be collected as described.

Reason for change:

Bone marrow will be collected from all animals on study (with the exception of found dead and control animals euthanized in extremis). Only the first 5 animals to receive a necropsy will have the slides analyzed in the micronucleus test.

② vehicle

Sponsor approval on: 10/13/10 via Email or ___ NA ___

■ **Protocol amendment forthcoming**

☐ **Clarification of procedure, no protocol amendment required**

Study Director: [redacted] **Date:** 10/14/10

① Clarifies that found dead and vehicle euthanized in extremis will not have bone marrow collected MK 10/15/10

A-186-9

Original: QAU
Copies as per protocol distribution

② Clarifies that vehicle control animal euthanized in extremis will not have bone marrow collected MK 10/15/10

② Corrects T/P MK 10/15

Study Number: WIL-402011

PROTOCOL AMENDMENT 1

Sponsor: American Petroleum Institute

Title of Study:

A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats

Protocol Modifications:

1) **7.5.2 Homogeneity and Stability of Test Substance Formulations:**

In accordance with Study Director Notification form A-186 dated September 22, 2010, this section is replaced with the following:

Analyses to demonstrate the stability of the test substance formulations had been established previously (WIL-402010, [redacted], Draft).

For homogeneity assessments, test substance formulations of sufficient volume for dosing a group of animals for up to one week (length dependent on stability results) will be prepared. Samples will be collected from the top, middle and bottom of the formulations and the samples analyzed to assess the homogeneity of the test substance in the mixtures. If aliquots of the test substance formulations will be stored prior to use, a volume of formulation similar in size to the amount needed for one day will be stored under suitable conditions for the maximum length of time acceptable. After remixing for a minimum of 30 minutes using a magnetic stirrer, samples will be collected from the top and bottom of the formulations and analyzed to assess the homogeneity after storage and resuspension. Homogeneity assessments will not be performed for test substance formulations that are solutions provided that the Sponsor provides pertinent solubility data. Any back-up samples kept at WIL Research Laboratories, LLC will be discarded after the study director's approval of the analytical results.

2) **7.10.3 Functional Observational Battery:**

   In accordance with Study Director Notification form A-186 dated September 15, 2010, the following is added:

   Groups 1 and 6 (sham and positive control) will not be evaluated.

3) **7.10.5 Clinical Pathology:**

   In accordance with Study Director Notification form A-186 dated September 15, 2010, the following is added:

   Groups 1 and 6 (sham and positive control) will not be assessed for clinical pathology. Females with total litter loss will have samples collected for analysis of clinical pathology.

4) **8.1.3 Females with Total Litter Loss:**

   The first section of this sentence is replaced with the following:

   Females with total litter loss will be euthanized by carbon dioxide inhalation with 24 hours of when the total litter loss is recorded.

Reasons for Protocol Modification:

1) Samples will be reassessed for homogeneity and resuspension homogeneity.

2) Functional observational battery evaluations are not necessary on the Mammalian Erythrocyte Micronucleus Test phase of the study.

3) Clinical pathology assessments are not necessary on the Mammalian Erythrocyte Micronucleus Test phase of the study. Females with total litter loss will have clinical pathology parameters assessed.

4) To provide time for females to have functional observational battery evaluated, animals will be euthanized within 24 hours of the recording of total litter loss.

Approval:

Sponsor's approval was obtained via mail on 10/08/10.

WIL Research Laboratories, LLC

[redacted]

Study Director — 27 OCT 2010 Date

[redacted]

FOR Senior Director of Developmental and Reproductive Toxicology — 29 Oct. 2010 Date

American Petroleum Institute

[redacted]

Sponsor Representative — 02 NOV 2010 Date

Departmental/Study Director Notification

Study Director: [redacted]

Study No.: WIL-402011

Please note the following:

7.5.2 Homogeneity and Stability of Test Substance Formulations:

Analyses to demonstrate the stability of the test substance formulations had been established previously (WIL-402010, [redacted] Draft).

For homogeneity assessments, test substance formulations of sufficient volume for dosing a group of animals for up to one week (length dependent on stability results) will be prepared. Samples will be collected from the top, middle and bottom of the formulations and the samples analyzed to assess the homogeneity of the test substance in the mixtures. If aliquots of the test substance formulations will be stored prior to use, a volume of formulation similar in size to the amount needed for one day will be stored under suitable conditions for the maximum length of time acceptable. After remixing for a minimum of 30 minutes using a magnetic stirrer, samples will be collected from the top and bottom of the formulations and analyzed to assess the homogeneity after storage and resuspension. Homogeneity assessments will not be performed for test substance formulations that are solutions provided that the Sponsor provides pertinent solubility data. Any back-up samples kept at WIL Research Laboratories, LLC will be discarded after the study director's approval of the analytical results.

Reason for change:

Samples will be reassessed for homogeneity and resuspension homogeneity.

Sponsor approval on: 09/22/10 via Email or ___ NA ___

■ **Protocol amendment forthcoming**

☐ **Clarification of procedure, no protocol amendment required**

Study Director: [redacted] **Date:** 9/22/10

Original: QAU
Copies as per protocol distribution

A-186-9

Departmental/Study Director Notification ①

Study Director: [redacted]

Study No.: WIL-402011

Please note the following:

7.10.3 Functional Observational Battery:

Groups 1 and 6 (Sham and positive control) *will not* be evaluated.

7.10.5 Clinical Pathology:

Groups 1 and 6 (Sham and positive control) *will not* be assessed for clinical pathology.

Females with total litter loss *will* have samples collected for analysis of clinical pathology.

Reason for change:

FOB evaluations and Clinical Pathology assessments are not necessary on the OECD 474 phase of this study.

Females with total litter loss should have clinical pathology assessed.

Sponsor approval on: 09/15/10 via Phone or NA

■ **Protocol amendment forthcoming**

☐ **Clarification of procedure, no protocol amendment required**

Study Director: [redacted] **Date:** 9/15/10

Original: QAU
Copies as per protocol distribution

A-186-9

① The original Study Director Notification cannot be located. ~~that will~~ serve as the ② ASK 10/27/10

② Remove wording ASK 10/27/10

PROTOCOL

A COMBINED 28-DAY REPEATED DOSE ORAL (GAVAGE)TOXICITY STUDY WITH THE REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE MICRONUCLEUS TEST IN RATS

(U.S. EPA OPPTS 870.3650/870.5395 and OECD Guideline 422/474)

Submitted To:

American Petroleum Institute
1220 L Street, NW
Washington, DC 20005

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-8946

1 OBJECTIVE:

To evaluate the potential toxic effects of test item when administered to rats for 28 days and to evaluate the potential of the test item to affect male and female reproductive performance such as gonadal function, mating behavior, conception, parturition and early postnatal development.

The objective of this study is also to assess the potential of the test substance to induce micronuclei in polychromatic erythrocytes (PCEs) in rat bone marrow following three consecutive days of treatment administered by oral gavage. This assay evaluates compounds for *in vivo* clastogenic activity and/or disruption of the mitotic apparatus.

This study will be conducted in accordance with the United States Environmental Protection Agency (EPA) Health Effects Test Guidelines OPPTS 870.3650, Combined Repeated Dose Toxicity Study With the Reproduction/ Developmental Toxicity Screening Test, July 2000, Organisation for Economic Cooperation and Development (OECD) Guideline for Testing of Chemicals, Guideline 422, Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test, March 22, 1996, the United States Environmental Protection Agency (EPA) Health Effects Test Guidelines OPPTS 870.5395, Mammalian Erythrocyte Micronucleus test, August 1998,and with the International Conference on Harmonisation (ICH), Guidelines S2A and S2B, and the Organisation for Economic Co-operation and Development (OECD), Guideline Number 474. This study will be conducted in compliance with the EPA TSCA (40 CFR Part 792) and OECD [C(97) 186/Final] Good Laboratory Practice Regulations.

2 PERSONNEL INVOLVED IN THE STUDY:

2.1 Sponsor Representative:

[redacted]
American Petroleum Institute
1220 L Street, NW
Washington, DC 20005
Tel: (202) 682-8333
Email: [redacted]

2.2 WIL Study Director:

[redacted]
Staff Toxicologist, Developmental and
Reproductive Toxicology
Tel: (419) 289-8700
Fax: (419) 289-3650
Email: [redacted]

2.3 Principal Investigator (Micronucleus Test):

[redacted]
Midwest BioResearch
8025 Lamon Avenue
Skokie, IL 60077
Tel: (847) 972-2500 ext. 328
Fax: (847) 972-2506
Email: [redacted]

2.4 WIL Departmental Responsibilities:

[redacted]
Director, Developmental and
Reproductive Toxicology
Emergency Contact
Tel: (419) 289-8700
Fax: (419) 289-3650
Email: [redacted]

[redacted]
President and Chief Operating Officer

[redacted]
Assistant Director, Developmental and
Reproductive Toxicology

[redacted]
Director, Pathology

[redacted]
Assistant Director, Neurosciences

[redacted]
Director, Metabolism and Analytical Chemistry

[redacted]
Clinical Veterinarian,
Head of Surgery and Experimental Medicine

[redacted]
Director, Informational Systems

[redacted]
Manager, Gross Pathology and
Developmental Toxicology Laboratory

[redacted]
Manager, Quality Assurance

[redacted]
Operations Manager, Developmental and
Reproductive Toxicology and the Formulations Laboratory

[redacted]
Manager, Reporting and Regulatory
Technical Services

2.5 Principal Investigator, Statistical Analysis:

For statistics conducted at BioSTAT Consultants, Inc.

[redacted]
BioSTAT Consultants, Inc.
528 West Centre Avenue
Portage, MI 49024
Tel: (269) 329-7976
Email: [redacted]

3 STUDY SCHEDULE:

Proposed Experimental Starting (Animal Receipt) Date:	September 7, 2010
Proposed Experimental Start (First Day of Dosing) Date:	September 23, 2010

Proposed Experimental
Completion/Termination Date: November 15, 2010

Proposed Audited Report Date: March 2011

4 TEST SUBSTANCE AND POSITIVE CONTROL INFORMATION:

4.1 Test Substance:

4.1.1 Identification:

Naphthenic Acid.

4.1.2 Lot Number:

CP006002

4.1.3 Expiration/Retest Date:

Test substance will be characterized following use for dose administration. Before use characterization was performed previously in WIL-402010 (Kuhl, Draft). Method of fabrication is held by the sponsor.

A statement will be provided by the testing facility specifically addressing whether the test substance was stable over the course of the testing period based on these sets of analyses.

4.1.4 Purity:

100%

4.1.5 Storage Conditions:

Room temperature.

4.1.6 Stability:

The test substance is considered to be stable under the storage conditions provided by the Sponsor.

4.1.7 Physical Description:

To be documented by WIL Research Laboratories, LLC.

4.1.8 Reserve Samples:

Reserve samples of the test substance will be taken in accordance with WIL Standard Operating Procedures and stored in the Archives at WIL Research Laboratories, LLC indefinitely, unless otherwise specified.

4.1.9 Personnel Safety Data:

Included in the study records. It is the responsibility of the Sponsor to notify the testing facility of any special handling requirements for the test substance. A Material Safety Data Sheet (MSDS) should accompany the test substance upon arrival at the laboratory.

4.1.10 Test Substance Disposition:

With the exception of the reserve sample for each batch of test substance, all neat test substance remaining at study completion will be returned to the Sponsor. Alternatively, the test substance can be retained for subsequent studies.

4.2 Positive Control Article:

4.2.1 Identification:

Cyclophosphamide monohydrate (CP, CAS number 6055-19-2), is a known clastogen.

The positive control article will be characterized by the manufacturer (Sigma-Aldrich). A copy of the Certificate of Analysis, generated by Sigma-Aldrich, will be provided to WIL Research Laboratories, LLC.

4.2.2 Lot Number:

To be documented in the study records.

4.2.3 Purity:

To be provided in the Certificate of Analysis.

4.2.4 Stability:

The positive control article is considered to be stable under the storage conditions provided by the manufacturer.

4.2.5 Physical Description:

To be documented by WIL Research Laboratories, LLC in the study records.

4.2.6 Storage Conditions:

To be stored as per the conditions provided by the manufacturer.

4.2.7 Reserve Samples:

A reserve sample of the positive control article will not be collected as part of this study.

4.2.8 Positive Control Article Disposition:

The positive control article will be disposed of, as appropriate, following the issuance of the Final Report or retained for use on future studies.

4.2.9 Personnel Safety:

If available, an MSDS, will be provided by the manufacturer. Double gloves (nitrile base with latex outer) and a half-face negative respirator with cartridge #60923 are to be worn while preparing and administering doses. Otherwise, routine safety precautions will be followed.

5 TEST SYSTEM:

5.1 Species:

Rat

5.2 Strain:

Sprague-Dawley Crl:CD(SD)

5.3 Source:

Charles River Laboratories, Inc.
(Facility to be documented in the study records)

5.4 Number on Study:

58 males and 58 females (maximum of 66 males and 66 females purchased; males and females will be ordered from separate barrier rooms to ensure avoidance of sibling mating). Animals not assigned to study will be transferred

to the stock animal colony or will be euthanized by carbon dioxide inhalation and the carcasses discarded.

This number of animals used on this study is consistent with OECD and OPPTS guidelines for reproduction/developmental toxicity screening studies.

5.5 Body Weight Range:

At randomization:	Males 300-500 g. Females 200-300 g.

5.6 Approximate Age:

At randomization:	Males and Females 70-80 days.

5.7 Identification System:

The F_0 animals will be uniquely identified by a Monel® metal eartag displaying the animal number. Individual cage cards will be affixed to each cage and will display the animal number, group number, study number, dosage level and sex of the animal.

5.8 Justification for Selection:

This species and strain of animal is recognized as appropriate for reproductive toxicity studies. WIL Research Laboratories, LLC has reproductive historical control data in the Crl:CD(SD) rat. This animal model has been proven to be susceptible to the effects of reproductive toxicants.

6 SPECIFIC MAINTENANCE SCHEDULE:

6.1 Animal Housing:

All animals will be individually housed in clean suspended wire mesh cages in an environmentally controlled room during the acclimation period and continuing until mating. The cages will be elevated above cage board or other suitable material, which will be changed at least three times each week. During cohabitation, the females will be paired (1:1) with a male from the same treatment group in a suspended wire mesh cage. Following successful mating, the females will be housed individually in a plastic cage containing ground corncob nesting material (Bed O'Cobs®) and will remain in these cages until euthanasia on lactation day 4. The cages will be subjected to routine cleaning at a frequency consistent with maintaining good animal health and WIL Standard Operating Procedures. The facilities at WIL Research Laboratories, LLC are

fully accredited by the American Association for Accreditation of Laboratory Animal Care International (AAALAC International).

6.2 Environmental Conditions:

Controls will be set to maintain temperature at 71 ± 5°F (22 ± 3°C) and relative humidity at 50 ± 20%. Temperature and relative humidity will be monitored continuously. Data for these two parameters will be scheduled for automatic collection on an hourly basis. Fluorescent lighting controlled by light timers will provide illumination for a 12 hour light/dark photoperiod. The ventilation rate will be set at a minimum of 10 room air changes per hour, 100% fresh air.

6.3 Drinking Water:

Reverse osmosis-purified water will be available *ad libitum*. Filters servicing the automatic watering system are changed regularly according to WIL Standard Operating Procedures. The municipal water supplying the laboratory is analyzed according to WIL Standard Operating Procedures on a routine basis to ensure that contaminants are not present in concentrations that would be expected to affect the outcome of the study.

6.4 Basal Diet:

PMI Nutrition International, LLC Certified Rodent LabDiet® 5002 will be offered *ad libitum* during the study except during fasting of males prior to blood collection for clinical chemistry as described in section 7.10.5. Periodic analyses of the certified feed are performed by the manufacturer to ensure that heavy metals and pesticides are not present at concentrations that would be expected to affect the outcome of the study. Results of the analyses are provided to WIL Research Laboratories, LLC by the manufacturer. Feeders will be changed and sanitized once per week.

7 EXPERIMENTAL DESIGN:

7.1 Animal Receipt and Quarantine:

Each animal will be inspected by a qualified technician upon receipt. Animals judged to be in good health and suitable as test animals will be placed immediately in quarantine for a minimum of 14 days. All animals will be sexed, weighed, permanently identified with a metal eartag and receive a clinical observation. During the quarantine period, each animal will be observed twice daily for changes in general appearance and behavior. For all males, the testes will be palpated at least once during the quarantine period. Prior to the start of the in-life phase, all animals will receive a detailed physical

examination and those animals judged to be suitable test subjects will be identified.

7.2 Randomization:

At the conclusion of the quarantine period, animals judged to be suitable test subjects and meeting acceptable body weight requirements will be assigned to the study at random using a computer program. At that time, the animal numbers and corresponding body weights will be entered into the WIL Toxicology Data Management Systems (WTDMS™). A printout containing the animal numbers and individual group assignments will be generated based on body weight stratification into a block design. Animals will then be arranged into groups according to the printout. The control and three test item groups will consist of 12 males and 12 females each. An additional 5 males and 5 females each will be assigned to the sham and positive control groups for the mammalian erythrocyte micronucleus test.

Any animal assigned to the study that is found dead, euthanized *in extremis* or exhibits abnormal clinical signs, reduced food consumption or body weight losses prior to the start of dosing may be replaced by an animal of appropriate age when possible. Replacement animals will be arbitrarily assigned (not computer randomized) to the study based on comparable body weights (if possible) with respect to the animal that was replaced.

7.3 Route and Rationale of Test Item Administration:

The route of administration will be oral (gavage) since this is a potential route of exposure to humans. Historically, this route has been used extensively for studies of this nature. Appropriately sized flexible, Teflon®-shafted, stainless steel ball-tipped dosing cannulae will be used for the oral administration by gavage.

7.4 Organization of Test Groups, Dosage Levels and Treatment Regimen:

7.4.1 Organization of Test Groups:

The dosage levels will be determined from results of previous studies and will be provided by the Sponsor Representative after consultation with the WIL Study Director.

The following table presents the study group arrangement.

Group Number	Test Item	Dosage Level (mg/kg/day)	Dose Concentration (mg/mL)	Dose Volume (mL/kg)	Number of Animals	
					Males	Females
1	Sham Control	0	0	0	5	5
2	Vehicle Control	0	0	10	12	12
3	Naphthenic Acid	100	10	10	12	12
4	Naphthenic Acid	300	30	10	12	12
5	Naphthenic Acid	900	90	10	12	12
6	Positive control[a]	60	6	10	5	5

a –The positive control, cyclophosphamide, will be administered to animals in Group 6 approximately 24hours prior to euthanasia for bone marrow collection.

7.4.2 Vehicle Control Item:

Corn oil.

7.4.3 Treatment Regimen:

The positive control, cyclophosphamide, will be administered to animals in Group 6 approximately 24 hours prior to euthanasia for bone marrow collection. The test and vehicle control items will be administered once daily at approximately the same time each day as follows:

7.4.3.1 Males:

Daily for at least 14 days prior to mating and continuing throughout mating for a minimum of 28 days.

7.4.3.2 Females:

Daily for 14 days prior to mating, throughout mating and continuing until one day prior to termination (lactation day 4 for females that deliver, post-mating day 25 or post-cohabitation day 25 for females that do not deliver).

7.4.3.3 Adjustment of Doses:

Individual dosages will be calculated based on the most recent body weight to provide the proper mg/kg/day dosage.

7.5 Preparation and Analysis of Test Substance Formulations:

7.5.1 Method and Frequency of Preparation:

Based on the physical characteristics of the test substance, appropriate methods will be used to ensure the best possible formulations of the test substance in the vehicle. Dosing formulations will be stored at room temperature for a period not to exceed established stability. The Study Director or designee will visually inspect the formulations prior to initiation of dosing. This visual inspection will be performed to ensure that the formulations are visibly homogeneous and acceptable for dosing. Any special procedures required for formulation will be documented according to Good Laboratory Practices and presented in the final report of this study. Test substance formulations will normally be prepared approximately weekly and divided into aliquots for daily dispensation. The test substance and vehicle formulations will be stirred continuously during dosing. Frequency of formulation may be adjusted based on stability results.

7.5.2 Homogeneity and Stability of Test Substance Formulations:

Analyses to demonstrate the stability and homogeneity of the test substance formulations has been established previously (WIL-402010, Kuhl, Draft).

7.5.3 Concentration of Test Substance Formulations:

Samples will be taken from the middle of each dosing formulation prepared during the in-life phase of the study. These samples will be analyzed to verify the concentration of the test item in the dosing formulations. Any backup samples kept at WIL Research Laboratories, LLC will be discarded following acceptance of the analytical results by the Study Director.

7.6 Preparation and Analysis of the Positive Control Article Formulation:

7.6.1 Method and Frequency of the Positive Control Article Formulation:

The positive control article formulation will be prepared for dosing as a weight-to-volume mixture in deionized water. A complete description of the method of the preparation for the positive control article formulation will be documented in the study records and described in the final report. The positive control article formulation will be prepared on the day of dose administration (24 hours prior to euthanasia).

7.6.2 Analysis of Positive Control Formulation:

No analysis to confirm cyclophosphamide concentration in the dosing formulation will be performed as part of this study. No correction factor will be used for the preparation of positive control formulation.

7.7 F_0 Breeding Procedure:

After a minimum of 14 days of treatment, one female will be cohabitated with one male rat, avoiding sibling mating, of the same treatment group (Charles River Laboratories will supply non-litter mates). Detection of mating will be confirmed by evidence of sperm in the vaginal lavage or by the appearance of a vaginal copulatory plug. After confirmation of mating, the female will be returned to an individual suspended plastic maternity cage containing nesting material, and the day will be designated as day 0 of gestation.

A maximum of 14 days will be allowed for mating. If no evidence of copulation is obtained after 14 days, the animals will be separated without further opportunity for mating, and the female will be placed in a suspended plastic maternity cage containing nesting material.

7.8 F_0 Parturition, Lactation and F_1 Litters:

The day parturition is initiated will be designated as day 0 of lactation. Any difficulties at the time of parturition will be recorded. When parturition is judged to be complete, the sex of each pup will be determined, pups will be examined for gross malformations and the number of stillbirths and live pups will be recorded. Any changes or abnormalities in nesting and nursing behavior will be recorded. The dam and litter will remain together until postnatal day (PND) 4.

7.9 F_1 Litter Identification:

Upon completion of parturition, all pups will be individually identified by tattoo markings applied to the digits. Standardization for litter size will not be performed.

7.10 General Observations During the Experimental Period:

7.10.1 F_0 Parental Appearance and Behavior:

Each parental rat (F_0) will be observed twice daily for moribundity and mortality, once in the morning and once in the afternoon. A detailed physical examination will be conducted weekly. Mortality and all signs of overt toxicity will be recorded on the day observed. The observations

shall include, but are not limited to, evaluations for changes in appearance of skin and fur, eyes, mucous membranes, respiratory, circulatory, autonomic and central nervous system function, somatomotor activity and behavior. During the period of expected parturition, the dams will be observed twice daily for dystocia, prolonged labor, delayed labor or other difficulties at parturition. All animals will also be observed on the day of necropsy and any findings will be recorded.

During the treatment period, each animal will be observed approximately 1 hour following each dose administration for findings that are potentially related to treatment or that might change before the next scheduled observation. Additional post-dosing observations may be necessary and will be documented in the study records.

7.10.2 F_0 Body Weights and Food Consumption:

Food consumption will not be recorded during the breeding period as the animals are cohabitated during this time. Any animals that are fasted prior to terminal blood collection will have body weights collected prior to and after fasting.

7.10.2.1 Males:

Individual body weights and food consumption will be recorded weekly, beginning one week prior to test item administration, on the first day of dosing and weekly thereafter until euthanasia. Body weights will also be recorded on the treatment days on which the FOB and Locomotor Activity measurements are recorded (animals allocated to these components of the study only) and prior to euthanasia.

7.10.2.2 Females:

Individual body weights and food consumption will be recorded weekly, beginning one week prior to test item administration, on the first day of dosing and weekly thereafter until evidence of copulation is observed. Following evidence of copulation, body weights and food consumption will be recorded on gestation days 0, 4, 7, 11, 14, 17 and 20 and on lactation days 1 and 4.

If a female is determined to have completed parturition at the morning parturition examinations, a lactation day 0 weight will be recorded for the female, and the weight will be used for calculation of dose volume. The lactation day 0 weights will not

be summarized or analyzed statistically but will be included on the individual animal data tables.

Body weights will also be recorded on the treatment days on which the FOB and Locomotor Activity measurements are recorded (animals allocated to these components of the study only) and prior to euthanasia.

7.10.3 Functional Observational Battery:

The FOB utilized at WIL Research Laboratories, LLC is based on previously developed protocols (Gad, 1982; Haggerty, 1989; Irwin, 1968; Moser *et al* 1988; Moser *et al*, 1991, O'Donoghue, 1989). All females will be evaluated once prior to dosing. In addition, all females (including those with total litter loss and who failed to deliver) will be evaluated prior to termination. All males will be evaluated once prior to dosing and following approximately 28 days of dose administration. Testing will be performed by the same trained technicians, wherever possible, who will not know the animal's group assignment and will be performed at approximately the same time each day. Testing of treatment groups will be balanced across the day of testing, to the extent possible. Animals will be observed for the following as described below (see WIL Standard Operating Procedures No. T1-112, as revised, for a description of scoring criteria):

7.10.3.1 Home Cage Observations:

Biting	Palpebral (eyelid) closure
Convulsions/Tremors	Posture
Feces consistency	

7.10.3.2 Handling Observations:

Ease of handling animal in hand	Muscle tone
Ease of removal from cage	Palpebral closure
Eye prominence	Piloerection
Fur appearance	Red/Crusty deposits
Lacrimation/Chromodacryorrhea	Respiratory rate/Character
Mucous membranes/Eye/Skin color	Salivation

7.10.3.3 Open Field Observations (Evaluated Over a 2-Minute Observation Period):

Arousal	Grooming
Backing	Mobility
Bizarre stereotypic behavior	Rearing
Convulsions/tremors	Time to first step (seconds)
Gait	Urination/Defecation
Gait score	

7.10.3.4 Sensory Observations:

Air righting reflex	Olfactory orientation
Approach response	Pupil response
Eyeblink response	Startle response
Forelimb extension	Tail pinch response
Hindlimb extension	Touch response

7.10.3.5 Neuromuscular Observations:

Grip strength-hind and forelimb	Hindlimb foot splay
Hindlimb extensor strength	Rotarod performance

7.10.3.6 Physiological Observations:

Body temperature	Catalepsy
Body weight	

7.10.4 Locomotor Activity:

All females will be evaluated once prior to dosing. In addition, all females (including those with total litter loss and who failed to deliver) will be evaluated prior to termination. All males will be evaluated once prior to dosing and following approximately 28 days of dose administration. The same animals used for FOB testing will also be assessed for locomotor activity. Animals will be tested at approximately the same time on each test day. Locomotor activity will be measured using the Kinder Scientific Motor Monitor System (Kinder Scientific Company, LLC, 12655 Danielson Ct #308, Poway, CA 92064) as described by WIL standard operating procedures. Locomotor activity sessions will be performed in a room equipped with a white noise generator set to operate at 70 ± 10 dB.

The test session will be of 60 minutes duration and will consist of twelve 5-minute intervals. The 12 collection intervals will be presented in six

10-minute intervals for reporting purposes. Locomotor activity measures evaluated are total and ambulatory activity counts obtained for the 60 minute test session. Locomotor activity will be initiated immediately following completion of the FOB.

7.10.5 Clinical Pathology:

Clinical Pathology assessments will be performed on all surviving animals/group at the scheduled necropsy (following a minimum of 28 days of dosing for the males and on lactation day 4 for the females).

Blood samples for hematology and serum chemistry will be collected via the retro-orbital sinus of each rat under isoflurane induced anesthesia just prior to euthanasia. All males will be fasted overnight prior to blood collection. Individual body weights will be recorded prior to and after fasting of animals. Because the females will be in lactation, these animals will not be fasted prior to blood collection.

For hematology, approximately 0.5 mL of blood will be collected in tubes containing EDTA as the anticoagulant. For serum clinical chemistry, approximately 1.5 mL of blood will be collected in tubes without anticoagulant. An additional 1.8 mL of blood will be collected from the vena cava immediately following euthanasia by carbon dioxide inhalation for the assessment of coagulation parameters.

Samples collected will be identified by the study number, test system or specimen number, identity/name of sample, date of collection and storage conditions, if appropriate.

Any requirement for additional testing of serum or plasma must be determined prior to 90 days after specimen has first been tested. Consequently, any remaining serum or plasma will be discarded 90 days after testing is completed.

7.10.5.1 Hematology:

Hemoglobin	Differential leukocyte count[a]
Hematocrit	Mean Platelet Volume (MPV)
Platelet count	Mean corpuscular volume (MCV)
Prothrombin time	Red Cell Distribution Width (RDW)
Erythrocyte count	Mean corpuscular hemoglobin (MCH)
Reticulocyte count	Hemoglobin Distribution Width (HDW)
Total leukocyte count	Activated partial thromboplastin time (APTT)
	Mean corpuscular hemoglobin concentration (MCHC)

a - If performed manually, results will include platelet estimates and RBC morphology.

7.10.5.2 Serum Chemistry:

Calcium	Creatinine
Chloride	Total bilirubin
Glucose	Urea nitrogen
Sodium	Globulin
Potassium	Albumin
Phosphorus	Albumin/Globulin Ratio
Total cholesterol	Alkaline phosphatase
Triglycerides	Alanine aminotransferase
Total protein	Aspartate aminotransferase
Bile acids	Gamma-glutamyltransferase

7.10.6 Examination of Offspring:

7.10.6.1 Appearance and Behavior:

All pups will be observed daily for general appearance, behavior and survival during lactation. A detailed physical examination will be recorded for each pup on PND 1 and 4. Any abnormalities in nesting and nursing behavior will be recorded. The pups will be sexed on PND 0 and 4.

7.10.6.2 Body Weights:

Individual pup body weights will be recorded on PND 1 and 4.

8 TERMINAL PROCEDURES:

8.1 Termination Procedures for F_0 Females:

8.1.1 Females Which Deliver:

On lactation day 4, all F_0 females that delivered will be euthanized by carbon dioxide inhalation. A gross necropsy will be performed, organ weights will be collected and tissues will be preserved as described in Section 8.4. The number of former implantation sites will be counted and recorded. Corpora lutea will also be counted and recorded.

8.1.2 Females Which Fail to Deliver:

On post-mating day 25 (females with evidence of copulation) or post cohabitation day 25 (females without evidence of mating), the F_0 females which have not delivered will be euthanized by carbon dioxide inhalation and subjected to a gross necropsy. The abdominal and thoracic cavities will be opened and the contents examined. Uteri which appear non-gravid by macroscopic examination will be opened and placed in 10% ammonium sulfide solution (Salewski, 1964) for detection of early implantation loss. Organ weights will be collected and tissues will be preserved as described in Section 8.4 with the exception of any ammonium sulfide stained uterus, which will be discarded. If evidence of macroscopic implantations is present, the number of implantation sites and corpora lutea will be recorded.

8.1.3 Females with Total Litter Loss:

Females with total litter loss will be euthanized by carbon dioxide inhalation on the same day the total litter loss is recorded. A gross necropsy will be performed and tissues will be preserved as described in Section 8.4. Organ weights will not be collected. The number of former implantation sites and corpora lutea will be recorded.

8.1.4 F_0 Deaths and Animals Euthanized *in Extremis*:

Females not surviving until the scheduled euthanasia will be necropsied as described in Section 8.4. Organ weights will not be collected. Animals not expected to survive to the next observation period (moribund) will be euthanized by carbon dioxide inhalation and necropsied as described in Section 8.4, with the following exceptions: The number and location of implantation sites or scars and corpora lutea will be recorded for females dying or euthanized during gestation and lactation. Tissues will be preserved as described in Section 8.4. Viable

fetuses will be euthanized by a subcutaneous injection of sodium pentobarbital in the scapular region. Recognizable fetuses will be examined externally for gross abnormalities. Representative specimens with malformations may be preserved in 10% neutral-buffered formalin, at the discretion of the study director. For females found dead or euthanized *in extremis* during lactation, all pups will be examined externally and examined according to Section 8.3.1.

Males not surviving until the scheduled euthanasia will be necropsied as described in Section 8.4. Any males not expected to survive to the next observation period (moribund) will be euthanized by carbon dioxide inhalation and also necropsied as described in Section 8.4. Organ weights will not be collected.

8.2 Termination Procedures for F_0 Males:

Following completion of the mating period (a minimum of 28 days of dose administration) the F_0 males will be euthanized by carbon dioxide inhalation and subjected to a gross necropsy, organ weight collection and tissue preservation as described in Section 8.4.

8.3 Termination Procedures for F_1 Generation:

8.3.1 Deaths and Pups Euthanized *in Extremis*:

Pups found dead on PND 0 or 1 will have lungs removed and placed in a saline-filled jar. If the lungs sink to the bottom of the jar, the pup will be reported as stillborn. If the lungs float, and/or there is the presence of milk in the stomach, the pup will be reported as born alive.

Moribund pups will be euthanized by an intraperitoneal injection of sodium pentobarbital. Stillborn pups, pups found dead and any pups that are euthanized *in extremis* will be dissected (including the heart and brain examined by a mid coronal slice) by a technique described by Stuckhardt and Poppe (1984). If a skeletal anomaly is suspected, the pups will be eviscerated, cleared, and stained with Alizarin Red S as described by Dawson (1926) and examined. Organs/tissues will be saved for possible histopathological examination in 10% neutral-buffered formalin only as deemed necessary by the gross findings. Cannibalized pups will be discarded without necropsy.

8.3.2 Euthanasia of Surviving F_1 Generation:

On PND 4, the F_1 rats will be euthanized by an intraperitoneal injection of sodium pentobarbital and discarded.

8.4 Anatomic Pathology:

8.4.1 Macroscopic Examination:

A complete necropsy will be conducted on all F_0 parental animals dying spontaneously, euthanized *in extremis* (by carbon dioxide inhalation) or at scheduled termination. This will include examination of the external surface, all orifices, the cranial cavity, the external surface of the brain, and the thoracic, abdominal and pelvic cavities including viscera. For F_0 females, the number of former implantation sites will be recorded.

At the time of necropsy, the following tissues and organs will be collected and placed in 10% neutral-buffered formalin (except as noted):

Adrenals (2)
Aorta
Bone with marrow (sternebrae)
Bone marrow smear[a]
Brain
  Cerebrum level 1
  Cerebrum level 2
  Cerebellum with medulla/pons
Coagulating gland
Eyes with optic nerve (2)[b]
Gastrointestinal tract
  Esophagus
  Stomach
  Duodenum
  Jejunum
  Ileum
  Cecum
  Colon
  Rectum
Heart
Kidneys (2)
Left femur[a]
Liver (sections of two lobes)
Lungs (including bronchi, fixed by inflation with fixative)
Lymph node
  Axillary (2)
  Mesenteric
  Mandibular (2)
Ovaries with oviducts (2)
Pancreas
Peripheral nerve (sciatic)
Pituitary
Prostate
Mandibular salivary glands (2)
Seminal vesicles (2)
Skeletal muscle (rectus femoris)
Skin with mammary gland[c]
Spinal cord (cervical)
Spleen
Testes with epididymides (2)[d]
Thyroids [with parathyroids if present (2)]
Thymus
Trachea
Urinary bladder
Uterus[e] with cervix and vagina
All gross lesions (all groups)

a - Bone marrow from the right femur will be collected and processed as described in Section 8.4.2. The bone marrow from the left femur is assigned for histological examination.
b - To be placed in Davidson's solution.
c - For females; a corresponding section of skin will be taken from the same anatomic area for males.
d - To be placed in Bouin's solution.
e - Any uterus that was placed in 10% ammonium sulfide solution for detection of implantation sites will be discarded and not preserved in 10% neutral-buffered formalin.

8.4.2 Bone Marrow Collection:

Five (5) randomly selected animals/sex in Groups 2-5 and all five animals/sex in the sham and positive control (Groups 1 and 6) will have bone marrow collected as described below.

Using a syringe containing fetal bovine serum, the bone marrow will be aspirated or flushed from the right femur into a centrifuge tube. Cells will be aspirated at least 2-3 times to ensure all cells are collected and there are no cell clumps. The suspension will be centrifuged and all but approximately 0.25 mL of the supernatant will be poured off. The pellet will be resuspended in the remaining fetal bovine serum. Using a 23-gauge needle with syringe, approximately one drop of the cell suspension will be used to prepare a bone marrow smear on an appropriately labeled, clean microscope slide. A minimum of two slides per animal will be prepared. Slides will be allowed to air dry and will then be fixed in 100% methanol for approximately 20 minutes and allowed to air dry again. The slides will be stored refrigerated until shipped at ambient temperature to Midwest BioResearch.

Slides will be coded for the micronucleus test so that the Principal Investigator is unaware of the treatment group during the evaluation.

The slides will be shipped to Midwest BioResearch for staining and evaluation. Slides will be shipped on the first available non-holiday Monday, Tuesday or Wednesday to the following address:

[redacted]
Midwest BioResearch
8025 Lamon Avenue
Skokie, IL 60077
Tel: (847) 972-2500 ext. 328
Fax: (847) 972-2506
Email: [redacted]

The recipient will be contacted prior to shipment to assure that the shipment will be handled appropriately upon receipt.

Quality assurance auditing of the conduct, results and reporting of the micronucleus test and interpretation of the results, as well as the archiving of these data, are the responsibility of the Test Site where the analyses will be conducted. Quality assurance inspections (audits) will be submitted to the Study Director at WIL Research Laboratories, LLC. A copy of the final micronucleus test report and the interpretation of the results (including Quality Assurance and GLP Compliance statements) will be included as an appendix to the WIL final report. The report will be comprehensive and shall attempt to define levels inducing toxic effects under the conditions of this investigation. Appropriate interpretation and data will be incorporated into the text of the WIL final report for the study.

8.4.3 Organ Weights:

The following organs will be weighed from all animals at the scheduled necropsy. Organ-to-final-body-weight and organ-to-final-brain-weight ratios will be calculated.

Adrenals (2)	Ovaries (with oviducts) (2)
Brain	Spleen
Epididymides*	Testes*
Heart	Thymus
Kidneys (2)	Thyroids with parathyroids+ (2)
Liver	Uterus with vagina
Lungs	

* - These paired organs will be weighed separately.
\+ - Tissue will be weighed after fixation in 10% neutral-buffered formalin.

8.4.4 Microscopic Examination:

Microscopic examination of hematoxylin-eosin stained paraffin sections will be performed on the tissues listed in Section 8.4.1 from all animals in the control and high-dose groups (euthanized at the primary necropsy) and from all animals that die or are euthanized *in extremis*. Sections of the testes and epididymides will also be stained with PAS and hematoxylin Microscopic examination may be extended to other organs/tissues or groups if a potential target organ is noted based on histopathological examination of tissues from the high-dose group or other parameters (organ weights, clinical pathology, etc.).

9 MICRONUCLEUS TEST:

Section 9 provides a brief description of the activities that will be performed by Midwest BioResearch in accordance to their onsite Standard Operating Procedures.

9.1 Processing of Bone Marrow Slides:

Slides will be stained with either Giemsa or Acridine Orange (A/O) staining solution (Hayashi *et al.*, 1983). Slides will be coded with animal numbers prior to receipt by Midwest BioResearch personnel. The animal numbers are acceptable for use in the control of bias prior to microscopic analysis.

9.2 Scoring Bone Marrow Polychromatic Erythrocytes for Micronuclei:

Slides from all surviving animals in the treatment and control groups will be analyzed. All microscopic analyses will be performed on coded slides so that the examiner does not know which treatment group a slide belongs. The

number of polychromatic erythrocytes (PCEs) and normochromatic erythrocytes (NCEs) will be simultaneously tallied in each field until 1000 total erythrocytes (TEs, or NCEs + PCEs) per slide have been scored by sequentially progressing one field at a time. NCEs appear as anucleate cells with a cytoplasm that stains dark, grayish-green with A/O stain or pale red with Giemsa stain. PCEs are also anucleate cells that are generally larger than NCEs with a cytoplasm that stains bright orange with A/O stain or blue/purple with Giemsa stain. The total number of PCEs and NCEs will be recorded and the ratio of PCE/TE determined. The number of micronucleated PCEs per 2000 PCEs and the number of micronucleated NCEs per 2000 NCEs is also evaluated. Micronuclei stain bright yellow or yellow/green with A/O stain or deep purple with Giemsa stain are generally round or almond shaped within the cytoplasm of the erythrocytes. Micronuclei have sharp borders and are generally between $1/20^{th}$ and $1/5^{th}$ the size of a PCE. Cells are scored as micronucleated whether they have one micronucleus or >1, which can sometimes occur.

9.3 Micronuclei Data Presentation:

The number of PCEs, NCEs, micronucleated PCEs, and micronucleated NCEs will be recorded manually. The percentage of micronucleated PCEs, percentage of micronucleated NCEs and the ratio of PCE/(PCE+NCE) will be calculated for each animal. Group means and standard deviations will be presented.

9.4 Criteria for Acceptability and Interpretation of the Micronucleus Assay:

In addition to the criteria listed below, the Principal Investigator may take additional factors into consideration in evaluating the test results based on sound scientific judgment and biological relevance.

9.5 Unacceptable Data:

Data will not be used either in the individual animal data or for statistical evaluation if obtained from study animals with either fewer than 500 PCEs or a PCE to total erythrocyte (PCE+NCE) ratio of less than 20% of the vehicle control.

9.6 Acceptable Micronuclei Scores for Negative and Positive Controls

The vehicle group mean must lie within the historical control range and will usually be less than 0.4% micronucleated PCEs. The positive control response must be higher than the vehicle group and be consistent with historical positive control data.

9.7 Statistical Evaluation:

The percentages of micronucleated cells in polychromatic erythrocytes (PCEs), micronucleated cells in normochromatic erythrocytes (NCEs) and in the ratio of PCEs to total erythrocytes for the test article and vehicle treated groups will be compared using an analysis of variance (ANOVA) (Snedecor and Cochran, 1980). If the ANOVA revealed statistically significant ($p<0.05$) intergroup variance, Dunnett's test (Dunnett, 1964) will be used to compare each test article-treated group to the vehicle group. In addition, the positive control and vehicle groups will be compared using a separate parametric one-way analysis of variance (ANOVA) (Snedecor and Cochran, 1980). Statistical significance will be assessed at a 95% confidence level ($p\leq0.05$).

9.8 Criteria for Positive Response:

The test article will be considered positive for induction of micronuclei if a dose-related increase in the percentage of PCEs with micronuclei is observed and a statistically significant increase relative to the vehicle is seen at one or more dose levels. Other criteria that take into account the biological relevance of the results will be considered in the final evaluation.

9.9 Criteria for Negative Response:

The test article is considered to be negative for inducing the formation of micronuclei in PCEs if there is no statistically significant increase in the percentage of PCEs with micronuclei when compared to the concurrent vehicle at any dose level.

9.10 Criteria for Equivocal Response:

Cases which do not clearly fit into the positive or negative criteria may be judged equivocal. In these cases the Principal Investigator, based on sound scientific judgment, may take additional factors into consideration in evaluating the test results. As a general rule the biological relevance of any result will be considered first.

10 DURATION OF THE STUDY:

The two generations to be studied (parental animals and first generation offspring) will be termed F_0 and F_1, respectively. The conduct of this study will require approximately 12 weeks for acclimation, mating, gestation and lactation of the F_0 generation.

11 STATISTICAL METHODS:

All analyses will be two-tailed for significance levels of 5% and 1%. All means will be presented with standard deviations. All statistical tests will be performed by a computer with appropriate programming as referenced below. The litter, rather than the pup, will be considered as the experimental unit.

11.1 In-Life Data:

Continuous data variables [mean body weights, body weight changes and food consumption at each interval], pre-coital intervals, gestation length, former implantation sites, corpora lutea, unaccounted-for sites, clinical pathology values (excluding Gamma glutamyltransferase) and Functional Observational Battery data values will be analyzed by a parametric one-way analysis of variance (ANOVA) (Snedecor, 1980). If the results of the ANOVA are significant ($p<0.05$), Dunnett's test (1964) will be applied to the data to compare the treated groups to the control group. Functional Observational Battery parameters which yield scalar or descriptive data will be analyzed by Fisher's Exact Test (Steel and Torrie, 1980).

Gamma glutamyltransferase values that fall under the detectable range will be assigned a value of 0.1 (half the lower limit of quantitation) for statistical analysis and reporting. Data will be subjected to the Kruskal-Wallis non-parametric ANOVA test (1952) to determine intergroup differences. If the results of the ANOVA are significant ($p<0.05$), Dunn's test (1964) will be used to compare the treated groups to the control group.

Male copulation, female conception, male and female mating and fertility indices of the treated groups will be compared to the control group using the Chi-square test with Yates' correction factor (Hollander, 1999).

11.2 Litter Data:

The mean litter proportions (% per litter) of pup viability during the postnatal period and sex ratio at birth will be subjected to the Kruskal-Wallis nonparametric ANOVA test (1952) to determine intergroup difference. If the results of the ANOVA are significant ($p<0.05$), Dunn's Test (1964) will be applied to the data to compare the treated groups to the control group. Mean litter weights, live litter size, and number of pups born will be subjected to the parametric ANOVA test (Snedecor, 1980) and Dunnett's test (1964) as described above with the litter representing the experimental unit.

11.3 Histopathology and Organ Weight Data:

Histopathological findings of each treated group will be compared to those of the control group by the Fisher's Exact test (Steel and Torrie, 1980). Organ weights (absolute and relative to body weights and relative to brain weights) will be subjected to a parametric ANOVA test (Snedecor, 1980) and Dunnett's test (1964) as described above.

11.4 Locomotor Activity Data:

Ambulatory and total counts will be analyzed, by sex and session, with a repeated measure analysis of variance (RMANOVA). Factors in the model will include treatment group (TRT), time interval (TIME), and the interaction of time interval and treatment group (TRT*TIME). The SAS® procedure PROC MIXED will be used for analysis with the random effect of animal included as the repeated measurement. The covariance structure across time will be selected by comparing Akaike's Information Criterion (AIC).

The monotonic dose response relationship will be evaluated using sequential linear trend tests based on ordinal spacing of dose levels. The linear dose by time interaction (LinTrt*Time) will be evaluated and, if significant at the 0.05 level, trend tests on treatment means will be performed at the 0.05 level for each time interval. If the linear dose by time interaction is not significant, the trend test will be conducted across the pooled time intervals of the entire session only.

Nonmonotonic dose responses will be evaluated whenever no significant linear trends are detected but TRT and/or TRT*TIME interaction is significant at the 0.01 level. Within the framework of the RMANOVA, pairwise comparisons will be made for each individual treated group with the control group through linear contrasts. If TRT*TIME is significant, the comparisons will be conducted for each time interval. If only the TRT effect is significant, the comparisons will be conducted across the pooled time intervals of the entire session. These nonmonotonic dose response comparisons will be conducted at the 0.01 significance level.

Repeated Measures Analysis will be conducted by BioSTAT, Inc. All statistical analyses will be conducted using SAS version 9.1 (SAS Institute, Inc., 2002-2003), or higher, software.

12 QUALITY ASSURANCE:

The study will be audited by the WIL Quality Assurance Unit while in progress to assure compliance with the study protocol and protocol amendments, WIL Standard Operating Procedures and the appropriate provisions of the OECD Good Laboratory Practice Regulations [C(97)186 Final] and EPA TSCA (40 CFR Part 792) Principles

of Good Laboratory Practices. The raw data and draft report will be audited by the WIL Quality Assurance Unit prior to submission to the Sponsor Representative to assure that the final report accurately describes the conduct and the findings of the study.

Portions of the study performed by Midwest BioResearch, or that are subcontracted to other Test Sites will be audited by their respective GLP Quality Assurance Units. Results of Quality Assurance inspections will be provided to the Study Director for review and a Quality Assurance Statement will be provided for inclusion in the Final Report.

Data requiring RMANOVA statistical analysis will be analyzed by BioSTAT Consultants, Inc. following the current procedural guidelines of BioSTAT Consultants, Inc. BioSTAT Consultants, Inc. will provide a statistical analysis report, which will be included as an appendix to the final report. Quality Assurance auditing of the statistical report (for internal consistency and consistency with the study report) will be conducted under the direction of the Quality Assurance Unit of WIL Research Laboratories, LLC.

This study will be included on the WIL master list of regulated studies.

13 RECORDS TO BE MAINTAINED:

All original raw data records, as defined by WIL SOPs and the applicable GLPs, will be stored as described in Section 14 in the Archives at WIL Research Laboratories, LLC.

14 WORK PRODUCT:

The Sponsor will have title to all documentation records, raw data, slides, specimens and other work product generated during the performance of the study. Any remaining formulation samples will be discarded upon issuance of the Final Report. All work product, including raw paper data, pertinent electronic storage media and specimens, will be retained for a period of six months following issuance of the final report in the Archives at WIL Research Laboratories, LLC. Thereafter, WIL Research Laboratories, LLC will charge a monthly archiving fee for retention of all work product. All work product will be stored in compliance with regulatory requirements.

Any work product, including documents, specimens, and samples, that are required by this protocol, its amendments, or other written instructions of the Sponsor, to be shipped by WIL Research Laboratories, LLC to another location will be appropriately packaged and labeled as defined by WIL's SOPs and delivered to a common carrier for shipment. WIL Research Laboratories, LLC will not be responsible for shipment following delivery to the common carrier.

Appropriate supporting documentation for statistical analyses conducted and reported by BioSTAT Consultants, Inc. will be maintained in the Archives at WIL Research Laboratories, LLC.

All work product generated at a performing laboratory will be retained at an appropriate archive facility as designated by the SOPs of the performing laboratory.

15 REPORTS:

The final report will contain a summary, test item data, methods and procedures, parental and pup data, WIL Historical Control Data, the analytical chemistry and pathology reports and an interpretation and discussion of the study results. The final report will be comprehensive and shall define level(s) inducing toxic effects as well as no observed adverse effect level(s) under the conditions of this investigation. The report will contain all information necessary to conform with current OECD and OPPTS specifications.

WIL Research Laboratories, LLC will submit one copy of an audited draft report in a timely manner upon completion of data collection prior to issuance of the final report. One revision will be permitted as part of the cost of the study, from which the Sponsor's reasonable revisions and suggestions will be incorporated into the final report, as appropriate. Additional changes or revisions may be made, at extra cost. It is expected that the Sponsor will review the draft report and provide comments to WIL Research Laboratories, LLC within a two-month time frame following submission. WIL Research Laboratories, LLC will submit the final report within one month following receipt of comments. If the Sponsor's comments and/or authorization to finalize the report have not been received at WIL Research Laboratories, LLC within one year following submission of the draft report, WIL Research Laboratories, LLC may elect to finalize the report following appropriate written notification to the Sponsor. Two electronic copies (PDF) of the final report on CD-R will be provided. Requests for paper copies of the final report may result in additional charges.

16 ANIMAL WELFARE ACT COMPLIANCE:

This study will comply with all applicable sections of the Final Rules of the Animal Welfare Act (AWA) regulations (9 CFR Parts 1, 2 and 3). The Sponsor should make particular note of the following:

- The Sponsor Representative's signature on this protocol documents for the Study Director the Sponsor's assurance that the study described in this protocol does not unnecessarily duplicate previous experiments.

- Whenever possible, procedures used in this study have been designed to avoid or minimize discomfort, distress or pain to animals. All methods are described in this study protocol or in written laboratory Standard Operating Procedures.

- Animals that experience severe or chronic pain or distress that cannot be relieved will be painlessly euthanized as deemed appropriate by the veterinary staff and Study Director. The Sponsor will be advised by the Study Director of all circumstances which could lead to this action in as timely a manner as possible.

- Methods of euthanasia used during this study are in conformance with the above-referenced regulation.

- The Sponsor/Study Director has considered alternatives to procedures that may cause more than momentary or slight pain or distress to the animals and has provided a written narrative description (AWA covered species) of the methods and sources used to determine that alternatives are not available.

17 PROTOCOL MODIFICATION:

Modification of the protocol may be accomplished during the course of this investigation. However, no changes will be made in the study design without the verbal or written permission of the Sponsor. In the event that the Sponsor verbally requests or approves a change in the protocol, such changes will be made by appropriate documentation in the form of protocol amendment. All alterations of the protocol and reasons for the modification(s) will be signed by the Study Director and the Sponsor Representative.

18 REFERENCES:

Dawson, A.B. A note on the staining of the skeleton of cleared specimens with Alizarin Red S. *Stain Technology* **1926,** *1,* 123-124.

Dunn, O.J. Multiple comparisons using rank sums. *Technometrics* **1964,** *6(3),* 241-252.

Dunnett, C.W. New tables for multiple comparisons with a control. *Biometrics* **1964,** *20,* 482-491.

Gad, S. A neuromuscular screen for use in industrial toxicology. *Journal of Toxicology and Environmental Health* **1982,** *9:691-*704.

Haggerty, G.C. Development of Tier 1 neurobehavioral testing capabilities for incorporation into pivotal rodent safety assessment studies. *Journal of the American College Toxicology* **1989,** *8:*53-69.

Hayashi M, Sofuni T and Ishidate M (Jr.). An application of acridine orange fluorescent staining to the micronucleus test. *Mutation Research* 1983 Jun; 120(4):241-7.

Hollander, M.; Wolfe, D.A. *Nonparametric Statistical Methods,* 2nd ed.; Hollander, M., Wolfe, D.A., Eds.; John Wiley and Sons, Inc.: New York, NY, **1999;** p 468.

Irwin, S. Comprehensive observational assessment: Ia. A systematic quantitative procedure for assessing the behavioral physiological state of the mouse. *Psychopharmacologia* **1968,** *13:*222-256.

Kruskal, W.H.; Wallis, W.A. Use of ranks in one-criterion variance analysis. *Journal of the American Statistical Association* **1952,** *47,* 583-621.

Kuhl, A.J. A 14-Day Oral (Gavage) Toxicity Study Of Naphthenic Acid In Rats (WIL-402010) WIL Research Laboratories, LLC, Ashland, Ohio, **Draft.**

Moser, V.C. McCormick, J.P.; Creason, J.P. and MacPhail, R.C. Comparison of Chloridimeform and Carbaryl Using a Functional Observational Battery. Fundamental and Applied Toxicology **1988,** *11,* 189-206.

Moser, V.C.; McDaniel, K.L.; Phillips, P.M. Rat strain and stock comparisons using a functional observational battery: Baseline values and effects of Amitraz. *Toxicology and Applied Pharmacology* **1991,** *108,* 267-283.

O'Donoghue, J.L. Screening for neurotoxicity using a neurologically based examination and neuropathology. *Journal of the American College Toxicology* **1989;** *8:97*-116.

Salewski, E. Färbemethode zum makroskopischen Nachweis von Implantationsstellen am Uterus der Ratte. [Staining method for a macroscopic test for implantation sites in the uterus of the rat]. *Naunyn - Schmiedebergs Archiv für Experimentelle Pathologie und Pharmakologie* **1964,** *247,* 367.

SAS Institute, Inc. SAS® Proprietary Software Release, Version 9.1, SAS Institute, Inc.: Cary, NC, **2002-2003.**

Snedecor, G.W.; Cochran, W.G. One Way Classifications; Analysis of Variance. In *Statistical Methods,* 7th ed.; The Iowa State University Press: Ames, IA, **1980;** pp 215-237.

Steel, R.G.D.; Torrie, J.H. *Principles and Procedures of Statistics, A Biometrical Approach,* 2nd ed.; McGraw-Hill Book Company: New York, NY, **1980;** pp 504-506.

Stuckhardt, J.L.; Poppe, S.M. Fresh visceral examination of rat and rabbit fetuses used in teratogenicity testing. *Teratogenesis, Carcinogenesis and Mutagenesis* **1984,** *4,* 181-188.

19 PROTOCOL APPROVAL:

Sponsor approval received via Email on 09/07/10.

American Petroleum Institute

[redacted] 13 Sept 2010
Sponsor Representative Date

WIL Research Laboratories, LLC

[redacted] 7 Sept 2010
Study Director Date

[redacted] 8 Sept 2010
Director, Developmental and Reproductive Toxicology Date

APPENDIX B

Test Substance Characterization (WIL Research Laboratories, LLC)

An Oral (Gavage) 14-Day and Pilot Prenatal Developmental Toxicity Study of Naphthenic Acid in Rats

Test Substance Characterization

Analytical Chemistry Department

WIL Research Laboratories, LLC

TABLE OF CONTENTS

Page

Table of Contents **2**
Index of Figures **2**
Index of Tables **3**
1. Introduction **4**
2. Key Study Personnel **4**
3. Experimental **4**
3.1. Gas Chromatography 4
3.2. Mass Spectrometry 5
3.3. Sample Processing 5
3.4. Characterization 5
4. Results and Discussion **6**
4.1. Test Article Characterization and Stability 8
5. Conclusion **8**
6. Report Review and Approval **9**
7. Abbreviations **10**

INDEX OF FIGURES

Figure 1: Representative Distribution of Carbon Numbers and Z Families of Neat Naphthenic Acid Before Use for Dose Administration 7

Figure 2: Representative Distribution of Carbon Numbers and Z Families of Neat Naphthenic Acid After Completion of Dose Administration 8

INDEX OF TABLES

Page

Table 1: Before Use Characterization of Neat Test Substance 13

Table 2: After Use Characterization of Neat Test Substance 14

1. INTRODUCTION

This report provides a detailed description of a method using gas chromatography (GC) with mass spectrometric (MS) detection for naphthenic acid characterization. Test substance samples were collected and analyzed prior to use for dose administration and after completion of dose administration 12 weeks later.

A list of abbreviations that may have been used in this report is located in Section 7. (Abbreviations).

2. KEY STUDY PERSONNEL

[redacted]

Assistant Director, Analytical Chemistry
Data Coordinator, Reporting & Technical Support Services
Group Manager, Reporting & Technical Support Services

3. EXPERIMENTAL

3.1. GAS CHROMATOGRAPHY

Instrument:	Agilent 6890 gas chromatograph (GC) equipped with an Agilent 5975 mass spectrometer (MS), an autosampler, and MSD Security ChemStation data system, or equivalent
Column:	Zebron ZB-5 column, 30 m × 0.32 mm ID, 0.25-µm film-thickness.
Temperature Program:	Initial temperature 100°C, hold for 3 minutes. Ramp at 8°C/min to 300°C
Carrier Gas:	Helium
Carrier Gas Pressure:	10.0 psi
Injector Temperature:	300°C
Injection Volume:	2.0 µL split
Split Ratio:	10:1
Run Time:	28 minutes

3.2. MASS SPECTROMETRY

Acquisition Parameters

Solvent Delay:	5.0 minutes
Ion Source:	Electron Impact
Scan Range:	55-550 m/z
Transfer Line Temperature:	290°C
Quadrupole Temperature:	150°C
Source Temperature:	230°C

3.3. SAMPLE PROCESSING

Triplicate aliquots of the test substance (50.0 µL each, WIL ID no 10006B) were added to glass autosampler vials, and 450 µL of methylene chloride was added to each vial. The samples were mixed with vortex action. An aliquot (10.0 µL) of each diluted sample was removed and placed in another autosampler vial along with 100 µL of the derivatizing agent, N-methyl-N-(*tert*-butyldimethylsilyl) trifluoroacetamine (MTBSTFA) containing 1% *tert*-butyldimethylsilylchloride. The vials were capped and mixed with vortex action for approximately 20 minutes at approximately 60°C. The caps were removed and the solvent was evaporated under a stream of nitrogen until dry. The contents were reconstituted in 0.500 mL of methylene chloride.

3.4. CHARACTERIZATION

Single injections were made of each sample. The average ion intensity from approximately 10 minutes to 28 minutes was used to calculate the normalized response for carbon numbers (n) 5 through 33 and Z numbers -2 though -12 using the following equation:

$$C_nH_{2n} + {}_ZO_2$$

In total, there were 156 ions monitored for naphthenic acids. The following chart lists the ions monitored.

n\z	0	-2	-4	-6	-8	-10	-12
5	102						
6	116						
7	130	128					
8	144	142					
9	158	156					
10	172	170	168				
11	186	184	182				
12	200	198	196	194			
13	214	212	210	208			
14	228	226	224	222	220		
15	242	240	238	236	234		
16	256	254	252	250	248	246	
17	270	268	266	264	262	260	
18	284	282	280	278	276	274	272
19	298	296	294	292	290	288	286
20	312	310	308	306	304	302	300
21	326	324	322	320	318	316	314
22	340	338	336	334	332	330	328
23	354	352	350	348	346	344	342
24	368	366	364	362	360	358	356
25	382	380	378	376	374	372	370
26	396	394	392	390	388	386	384
27	410	408	406	404	402	400	398
28	424	422	420	418	416	414	412
29	438	436	434	432	430	428	426
30	452	450	448	446	444	442	440
31	466	464	462	460	458	456	454
32	480	478	476	474	472	470	468
33	494	492	490	488	486	484	482

4. RESULTS AND DISCUSSION

Figure 1 and Figure 2 are graphs displaying the representative distribution of carbon numbers and Z families for the test substance before use and after completion of dose administration. The sum of all the normalized intensities equals 100%.

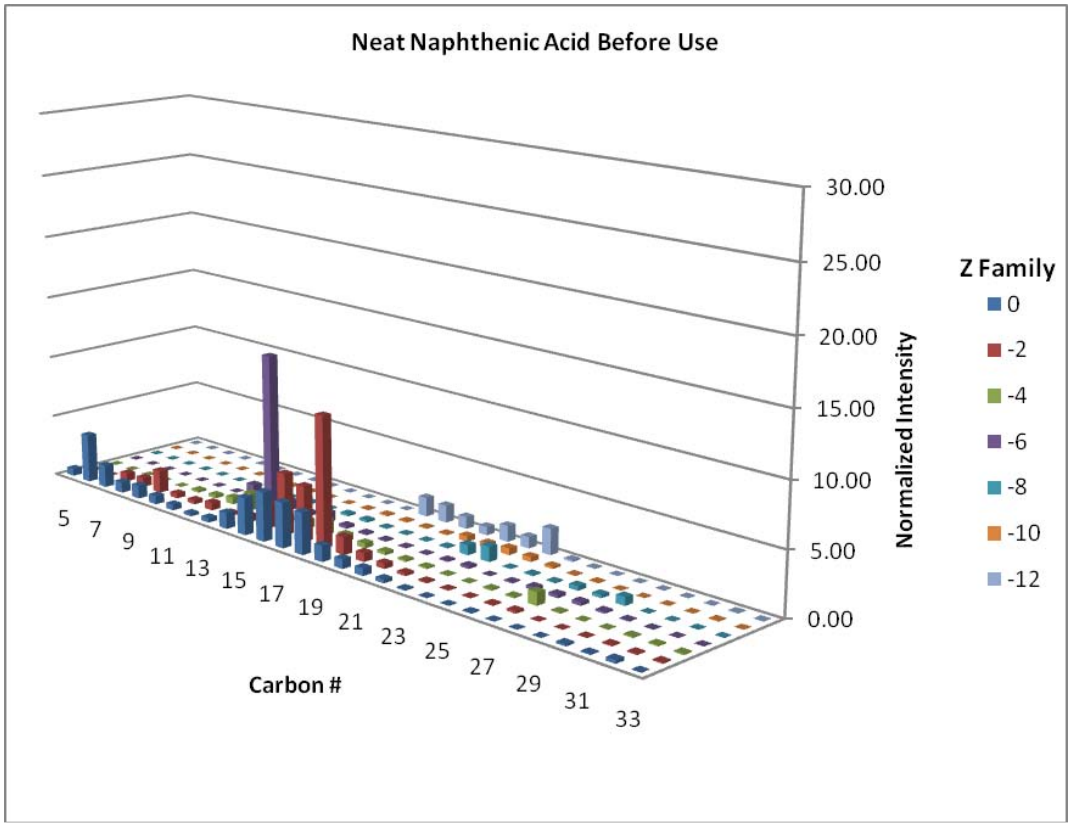


Figure 1: Representative Distribution of Carbon Numbers and Z Families of Neat Naphthenic Acid Before Use for Dose Administration

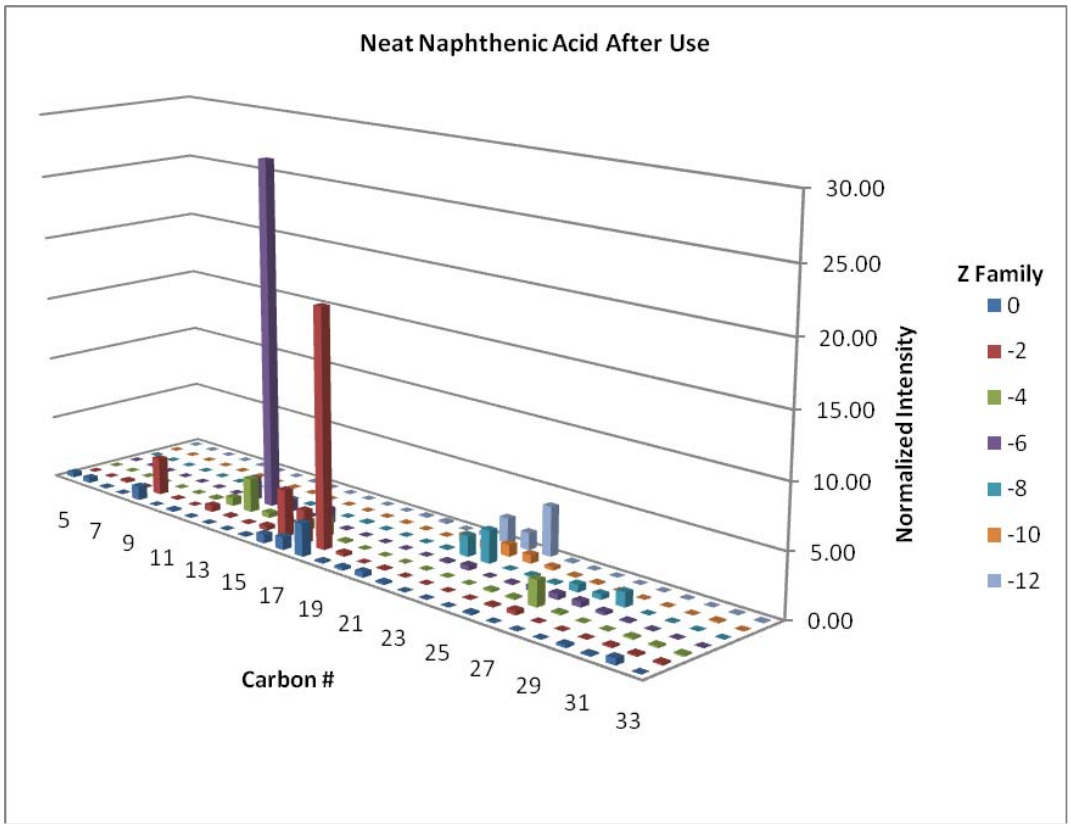


Figure 2: Representative Distribution of Carbon Numbers and Z Families of Neat Naphthenic Acid After Completion of Dose Administration

4.1. TEST ARTICLE CHARACTERIZATION AND STABILITY

The characterization of the test substance prior to use for dose administration is summarized in Table 1. Following 12 weeks of room temperature storage, the characterization assessment was repeated and is summarized in Table 2.

5. CONCLUSION

A GC/MS method was used to characterize neat naphthenic acid. Test substance samples were collected and analyzed prior to use for dose administration and after completion of dose administration 12 weeks later.

6. REPORT REVIEW AND APPROVAL

Report Approved by:

[redacted]

8 Dec 2010
Date

Staff Toxicologist, Developmental
and Reproductive Toxicology
Study Director

Report Prepared by:

[redacted]

8 Dec 2010
Date

Assistant Director, Analytical Chemistry

7. ABBREVIATIONS

The following abbreviations may apply to this report:

µ	-	micro
µL	-	microliter
ACN	-	acetonitrile
amu	-	atomic mass unit
AUC	-	area under the curve
cm	-	centimeter
conc.	-	concentration
DI	-	deionized
DMSO	-	dimethylsulfoxide
EPA	-	Environmental Protection Agency
ESI+	-	positive electrospray ionization
FA	-	formic acid
FDA	-	Food and Drug Administration
FIFRA	-	Federal Insecticide, Fungicide and Rodenticide Act
g	-	gram
GLP	-	Good Laboratory Practices
GMP	-	Good Manufacturing Practices
HPLC	-	high performance liquid chromatography
hr	-	hour(s)
IS	-	internal standard
kg	-	kilogram
L	-	liter
LLOQ	-	lower limit of quantitation
M	-	molar
MC	-	methylcellulose
MeOH	-	methanol
mg	-	milligram
mL	-	milliliter
mm	-	millimeter
msec	-	milliseconds
MS	-	mass spectrometry
mM	-	millimolar
NA	-	not applicable
ND	-	not detected
ng	-	nanogram
nm	-	nanometer
ppm	-	parts per million
QC	-	quality control

%RE	-	percent relative error
RSD	-	relative standard deviation
SD	-	standard deviation
SOP	-	standard operating procedure
SPE	-	solid phase extraction
UV	-	ultraviolet
v	-	volume
w	-	weight
WIL	-	WIL Research Laboratories, LLC
WTDMS™	-	WIL Toxicology Data Management System

TABLES 1 - 2

AN ORAL (GAVAGE) 14-DAY AND PILOT PRENATAL
DEVELOPMENTAL TOXICITY STUDY OF NAPHTHENIC ACID IN RATS

Table 1: Before Use Characterization of Neat Test Substance

(Analyzed 17 May 2010)

Carbon #	Percent of Total Ion Intenstity (WIL ID no. 10006B)			Mean % of Total
	Run # 002	Run # 003	Run # 004	
5	0.609	0.585	0.586	0.593
6	3.98	3.81	3.91	3.90
7	2.62	2.41	2.45	2.50
8	1.61	1.57	1.60	1.59
9	2.81	2.89	2.85	2.85
10	1.33	1.22	1.25	1.27
11	1.10	1.02	1.03	1.05
12	2.53	2.53	2.50	2.52
13	13.7	14.4	14.1	14.1
14	3.14	3.09	3.09	3.11
15	5.58	5.46	5.63	5.55
16	10.6	10.3	10.5	10.5
17	9.62	9.58	9.68	9.63
18	15.7	16.0	16.0	15.9
19	4.69	4.55	4.65	4.63
20	2.94	2.77	2.84	2.85
21	2.31	2.37	2.39	2.36
22	3.21	3.20	3.16	3.19
23	3.02	3.12	3.10	3.08
24	2.63	2.70	2.60	2.65
25	0.703	0.711	0.662	0.692
26	0.747	0.718	0.692	0.719
27	1.90	1.94	1.89	1.91
28	0.653	0.693	0.618	0.655
29	0.821	0.853	0.808	0.827
30	0.290	0.296	0.270	0.285
31	0.346	0.347	0.323	0.339
32	0.569	0.622	0.563	0.585
33	0.242	0.270	0.231	0.248

402010 Characterization data.xls Characterization
Printed: 01Nov2010 8:48 AM

AN ORAL (GAVAGE) 14-DAY AND PILOT PRENATAL
DEVELOPMENTAL TOXICITY STUDY OF NAPHTHENIC ACID IN RATS

Table 2: After Use Characterization of Neat Test Substance

(Analyzed 6 August 2010)

Carbon #	Percent of Total Ion Intensity (WIL ID no. 10006B)			Mean % of Total
	Run # 010	Run # 011	Run # 012	
5	0.375	0.375	0.388	0.379
6	0.723	0.595	0.408	0.576
7	0.441	0.330	0.234	0.335
8	0.187	0.174	0.146	0.169
9	4.06	4.06	4.04	4.05
10	0.125	0.106	0.0768	0.103
11	0.268	0.250	0.230	0.250
12	2.97	3.00	2.95	2.97
13	28.7	29.3	30.5	29.5
14	1.62	1.53	1.39	1.51
15	1.15	1.02	0.796	0.988
16	6.73	6.61	6.39	6.58
17	5.62	5.39	5.21	5.41
18	20.7	21.0	21.5	21.1
19	0.738	0.618	0.525	0.627
20	0.312	0.273	0.234	0.273
21	1.49	1.50	1.48	1.49
22	4.45	4.49	4.46	4.47
23	5.19	5.19	5.20	5.19
24	4.51	4.54	4.58	4.54
25	0.738	0.720	0.663	0.707
26	1.06	1.15	0.966	1.06
27	3.40	3.45	3.44	3.43
28	1.01	1.01	0.966	0.993
29	1.39	1.37	1.35	1.37
30	0.364	0.360	0.307	0.344
31	0.430	0.421	0.392	0.414
32	0.940	0.917	0.877	0.911
33	0.297	0.292	0.291	0.293

402010 Characterization data.xls Characterization (3)
Printed: 01Nov2010 8:48 AM

A Combined 28-day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats

Test Substance Characterization

Analytical Chemistry Department

WIL Research Laboratories, LLC



TABLE OF CONTENTS

Page

Table of Contents **2**
Index of Figures **2**
Index of Tables **2**
1. Introduction **3**
1.1. Key Study Dates 3
1.2. WIL Research Key Study Personnel 3
2. Experimental Procedures - Materials and Methods **3**
2.1. Gas Chromatography 3
2.2. Mass Spectrometry 4
2.3. Sample Processing 4
2.4. Characterization 5
3. Results and Discussion **6**
3.1. Test Article Characterization 7
4. Conclusion **7**
5. Report Review and Approval **9**
6. Abbreviations **10**

INDEX OF FIGURES

1. Representative Distribution of Carbon Numbers and Z Families of Neat Naphthenic Acid after Completion of Dose Administration 7

INDEX OF TABLES

1. After-Use Characterization of Neat Test Substance 12

1. INTRODUCTION

This report provides a detailed description of a method using gas chromatography (GC) with mass spectrometric (MS) detection for naphthenic acid characterization. Test substance samples were collected and analyzed after completion of dose administration at WIL Research. Approximately 90% of the total mass of the test substance is accounted for in the same 14-16 carbon numbers indicating that the material was likely stable for the duration of use.

A list of abbreviations potentially used in this report is presented in Section 6. (Abbreviations).

1.1. KEY STUDY DATES

Date(s)	Event(s)
7 February 2011	First date of analysis
7 February 2011	Last date of analysis

1.2. WIL RESEARCH KEY STUDY PERSONNEL

[redacted]	Assistant Director, Analytical Chemistry
[redacted]	Senior Publishing Specialist, Reporting & Technical Support Services
[redacted]	WIL Research-US Manager, Computerized Systems Validation

2. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

2.1. GAS CHROMATOGRAPHY

Instrument:	Agilent 6890 gas chromatograph equipped with an Agilent 5975 mass spectrometer, an autosampler, and MSD Security ChemStation data system, or equivalent
Column:	Zebron ZB-5 column, 30 m × 0.32 mm ID, 0.25-µm film-thickness
Temperature Program:	Initial temperature 100°C, hold for 3 minutes Ramp at 8°C/minute to 300°C

Carrier Gas:	Helium
Carrier Gas Pressure:	10.0 psi
Injector Temperature:	300°C
Injection Volume:	1.0 µL split
Split Ratio:	10:1
Run Time:	28 minutes

2.2. MASS SPECTROMETRY

Acquisition Parameters

Solvent Delay:	5.5 minutes
Ion Source:	Electron Impact
Scan Range:	55 to 550 m/z
Transfer Line Temperature:	290°C
Quadrupole Temperature:	150°C
Source Temperature:	230°C

2.3. SAMPLE PROCESSING

Triplicate aliquots of the test substance (50.0 µL each, WIL ID no. 10006B) were added to glass autosampler vials, and 450 µL of methylene chloride was added to each vial. The samples were mixed with vortex action. An aliquot (10.0 µL) of each diluted sample was removed and placed in another autosampler vial along with 100 µL of the derivatizing agent, N-methyl-N-(tert-butyldimethylsilyl) trifluoroacetamine (MTBSTFA) containing 1% tert-butyldimethylsilylchloride. The vials were capped and mixed with vortex action for approximately 20 minutes at approximately 60°C. The caps were removed, and the solvent was evaporated under a stream of nitrogen until dry. The contents were reconstituted in 0.500 mL of methylene chloride.

2.4. CHARACTERIZATION

Single injections were made of each sample. The average ion intensity from approximately 8.5 minutes to 28 minutes was used to calculate the normalized response for carbon numbers (n) 5 through 33 and Z numbers -2 though -12 using the following equation:

$$C_nH_{2n} + {}_ZO_2$$

In total, there were 156 ions monitored for naphthenic acids. The following chart lists the ions monitored.

Ions Monitored for Naphthenic Acids

n\z	0	-2	-4	-6	-8	-10	-12
5	102						
6	116						
7	130	128					
8	144	142					
9	158	156					
10	172	170	168				
11	186	184	182				
12	200	198	196	194			
13	214	212	210	208			
14	228	226	224	222	220		
15	242	240	238	236	234		
16	256	254	252	250	248	246	
17	270	268	266	264	262	260	
18	284	282	280	278	276	274	272
19	298	296	294	292	290	288	286
20	312	310	308	306	304	302	300
21	326	324	322	320	318	316	314
22	340	338	336	334	332	330	328
23	354	352	350	348	346	344	342

-continued-

Ions Monitored for Naphthenic Acids

n\z	0	-2	-4	-6	-8	-10	-12
24	368	366	364	362	360	358	356
25	382	380	378	376	374	372	370
26	396	394	392	390	388	386	384
27	410	408	406	404	402	400	398
28	424	422	420	418	416	414	412
29	438	436	434	432	430	428	426
30	452	450	448	446	444	442	440
31	466	464	462	460	458	456	454
32	480	478	476	474	472	470	468
33	494	492	490	488	486	484	482

3. RESULTS AND DISCUSSION

Figure 1 displays the representative distribution of carbon numbers and Z families for the test substance after completion of dose administration. The sum of all the normalized intensities equals 100%.

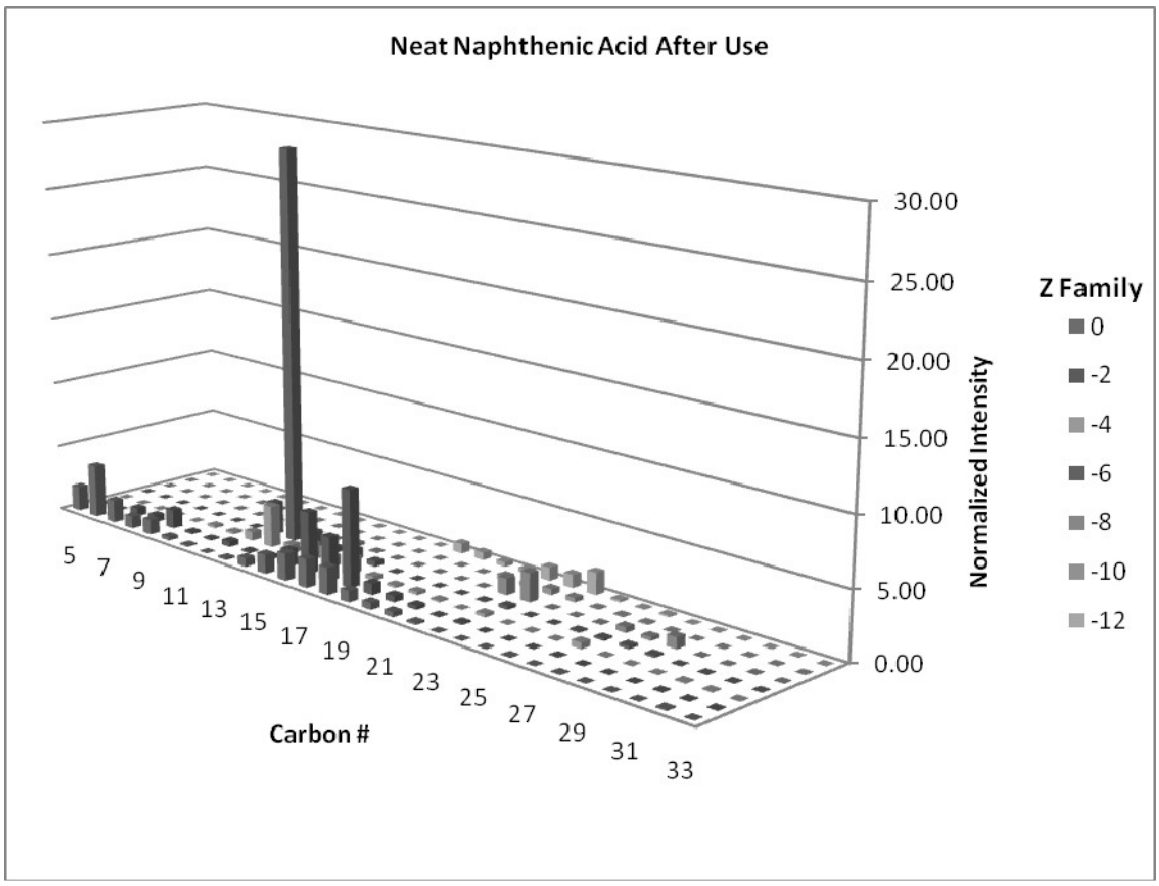


Figure 1: Representative Distribution of Carbon Numbers and Z Families of Neat Naphthenic Acid after Completion of Dose Administration

3.1. TEST ARTICLE CHARACTERIZATION

The characterization of the test substance following use for dose administration is summarized in Table 1. Approximately 90% of the total mass of the test substance is accounted for in the same 14-16 carbon numbers indicating that the material was likely stable for the duration of use.

4. CONCLUSION

A GC/MS method was used to characterize neat naphthenic acid. Test substance samples were collected and analyzed after completion of dose administration at WIL Research. Approximately 90% of the total mass of the test substance is accounted for in the same

14-16 carbon numbers indicating that the material was likely stable for the duration of use.

5. REPORT REVIEW AND APPROVAL

WIL-402011 Test Substance Characterization Report

Report Reviewed and Approved by:

[redacted]

30 Aug 2012
Date

Staff Toxicologist, Developmental
and Reproductive Toxicology
Study Director

Report Prepared by:

[redacted]

30 Aug 2012
Date

Assistant Director, Analytical Chemistry

6. ABBREVIATIONS

The following abbreviations may apply to this report:

µ	-	micro
µL	-	microliter
ACN	-	acetonitrile
btm	-	bottom
cm	-	centimeter
conc.	-	concentration
DI	-	deionized
DMSO	-	dimethylsulfoxide
ESI+	-	positive electrospray ionization
FA	-	formic acid
g	-	gram
HPLC	-	high performance liquid chromatography
hr	-	hour(s)
IS	-	internal standard
kg	-	kilogram
L	-	liter
LLOQ	-	lower limit of quantitation
MC	-	methylcellulose
MeOH	-	methanol
mg	-	milligram
mL	-	milliliter
mm	-	millimeter
msec	-	milliseconds
MS	-	mass spectrometry
mM	-	millimolar
NA	-	not applicable
ND	-	not detected
ng	-	nanogram
QC	-	quality control
%RE	-	percent relative error
RSD	-	relative standard deviation
SD	-	standard deviation
SOP	-	standard operating procedure
SPE	-	solid phase extraction
UV	-	ultraviolet
v	-	volume
w	-	weight
WIL Research	-	WIL Research Laboratories, LLC

TABLE 1

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 1. After-Use Characterization of Neat Test Substance

(Analyzed 7 February 2011)

Carbon #	Percent of Total Ion Intensity (WIL ID no. 10006B)			Mean % of Total
	Run # 007	Run # 008	Run # 009	
5	1.72	1.78	1.85	1.78
6	3.46	3.40	3.94	3.60
7	2.10	2.01	2.30	2.14
8	1.32	1.25	1.43	1.33
9	2.41	2.32	2.51	2.41
10	0.62	0.49	0.62	0.58
11	0.39	0.35	0.38	0.38
12	3.55	3.67	3.53	3.58
13	33.42	34.34	32.65	33.47
14	2.74	2.74	2.78	2.75
15	4.12	4.13	4.54	4.26
16	7.86	7.75	8.14	7.91
17	6.64	6.54	6.90	6.70
18	10.17	10.18	10.23	10.19
19	2.32	2.17	2.40	2.30
20	1.51	1.50	1.57	1.53
21	1.46	1.54	1.41	1.47
22	2.90	2.90	2.77	2.85
23	4.45	4.43	4.16	4.35
24	2.16	2.14	1.99	2.09
25	0.33	0.31	0.26	0.30
26	0.43	0.37	0.34	0.38
27	1.47	1.42	1.27	1.39
28	0.71	0.65	0.60	0.66
29	1.17	1.14	1.01	1.10
30	0.03	0.02	0.02	0.02
31	0.21	0.16	0.13	0.17
32	0.24	0.25	0.21	0.23
33	0.09	0.06	0.06	0.07

402011 Characterization data.xls Characterization
Printed: 22Feb2011 12:40 PM

APPENDIX C

Certificate of Analysis, Test Substance Analyses Report, and
Material Data Safety Sheet (Supplier- or Sponsor-Provided Data)

Certificate of Analysis

SIGMA-ALDRICH

Product Name	Cyclophosphamide monohydrate, bulk package
Product Number	C0768
Product Brand	SIGMA
CAS Number	6055-19-2
Molecular Formula	$C_7H_{15}Cl_2N_2O_2P \cdot H_2O$
Molecular Weight	279.10
Storage Temp	2-8°C

TEST	SPECIFICATION	LOT 079K1569 RESULTS
Appearance (Color)	White to Off-White	White
Appearance (Form)	Powder	Powder
Solubility (Color)	Colorless	Colorless
Solubility (Turbidity)	Clear	Clear
	100 mg/ml in H2O	
Water (by Karl Fischer)	4.7 - 7.8 %	7.7 %
Proton NMR spectrum	Conforms to Structure	Conforms
Purity (HPLC)	97.0 - 103.0 %	100.5 %
Recommended Retest Period	----------	----------
	3 Years	
Specification Date:		OCT 2009
Date of QC Release:		OCT 2009
Recommended Retest Date:		JUL 2012
Print Date:		OCT 12 2009

Rodney Burbach, Manager
Quality Control
St. Louis, Missouri USA

Report of the results of GC-MS analyses of naphthenic acids from API

January 29, 2009

Phillip M. Fedorak
Department of Biological Sciences
University of Alberta
Edmonton, Alberta Canada

Samples and Methods

In January 2009, three neat naphthenic acids samples were received in the Department of Biological Sciences at the University of Alberta.

A stock solution of each of the three samples was made by transferring 50 µL of the sample to a GC-MS vial using a rinsed lambda pipette. The volume of the solution was brought up to 0.5 mL with dichloromethane. Then, 10 µL of the sample stocks were transferred to new, labeled GC-MS vials. The derivatization was done by adding 100 µL of Sigma MTBSTFA derivatizing agent to each vial. The samples were heated at 60°C for 20 min.

The samples were dried down under a stream of nitrogen and then redissolved in 0.5 mL dichloromethane. The samples were analyzed by GC-MS (Young et al. 2008) and the total ion current mass spectra were collected. The data obtained were put into a Microsoft Excel spreadsheet (Holowenko et al. 2002) to prepare a table of the relative abundances of each ion corresponding to the general formula for naphthenic acids, formula $C_nH_{2n+Z}O_2$, where n is the carbon number and Z is zero or a negative even number defining the hydrogen deficiency due to cyclization. The distributions of ions summarized in each table was used to prepare a three-dimensional plots of the ion abundances for each n and Z value.

Results

The tables of relative abundances of each ion (expressed as percentages) and the three-dimensional plots are shown of the following pages. The values of the percentages reported in these tables are rounded to the nearest integer.

Data from each analysis were compared to data from the other analyses using the statistical method of Clemente et al. (2003). For the group 1 naphthenic acids (C_5 to C_{13}), there were no statistically significant differences ($P>0.05$) among the samples from the three drums. Similarly, for the group 2 naphthenic acids (C_{14} to C_{21}), there were no statistically significant differences ($P>0.05$) among the samples from the three drums.

Statistical analyses of the group 3 naphthenic acids (C_{22} to C_{33}), showed that there were statistically significant differences ($P<0.05$) between the samples from drum 1 and drum 2 and drum 3, and between samples from drum 2 and drum 3. However, because there are virtually no ions in this group (i.e. <1% of total ions), these differences are not important.

API DRUM 1 MERICHEM SAMPLE JANUARY 28, 2009

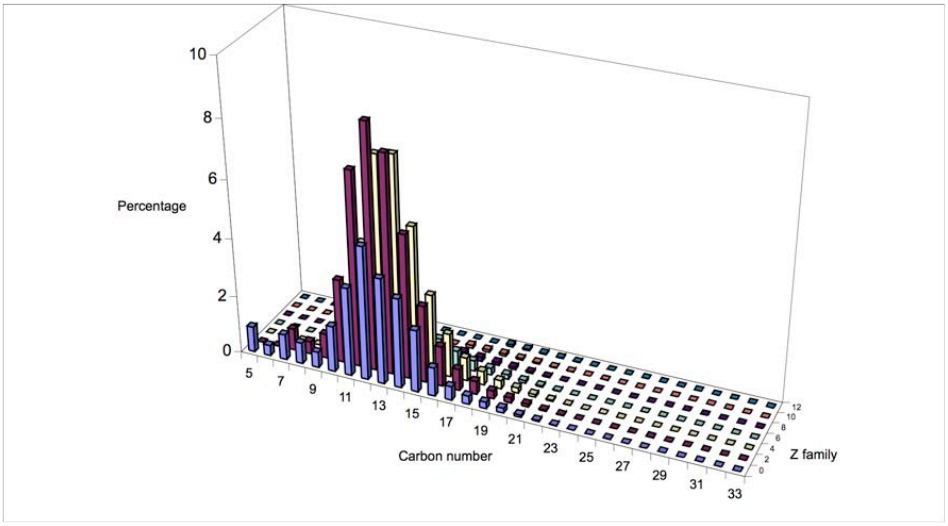
C number	z number							
	0	2	4	6	8	10	12	% carbon no
5	1	0	0	0	0	0	0	1
6	0	0	0	0	0	0	0	0
7	1	1	0	0	0	0	0	2
8	1	0	0	0	0	0	0	1
9	1	1	0	0	0	0	0	1
10	2	3	1	0	0	0	0	6
11	3	7	4	0	0	0	0	14
12	5	8	7	1	0	0	0	21
13	4	8	7	1	0	0	0	19
14	3	5	5	1	0	0	0	15
15	2	3	3	1	0	0	0	9
16	1	1	2	1	0	0	0	5
17	0	1	1	0	0	0	0	3
18	0	0	0	0	0	0	0	2
19	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0
% by z No	24	39	31	5	1	0	0	100

API DRUM 2 MERICHEM SAMPLE January 28, 2009

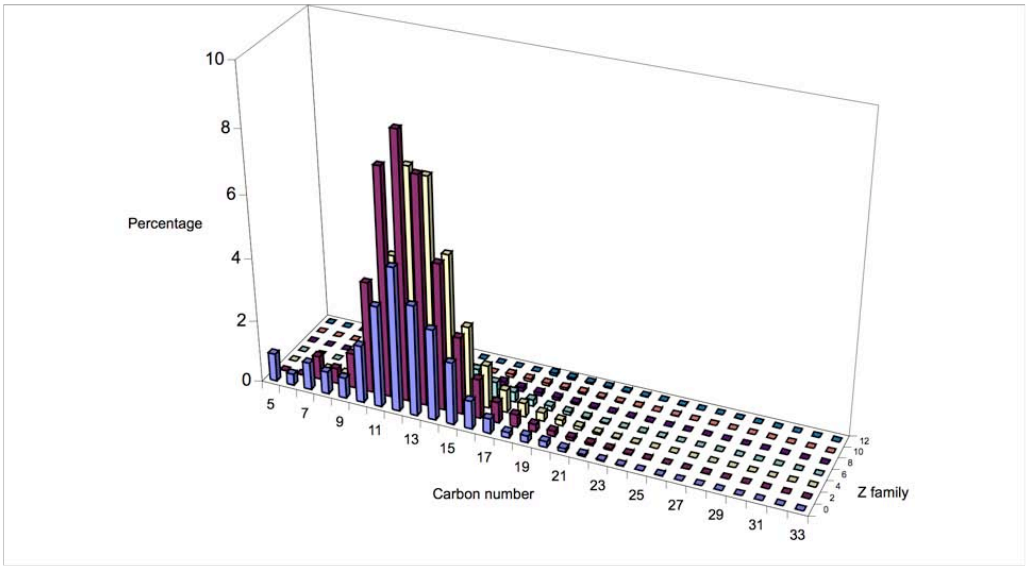
C number	z number							
	0	2	4	6	8	10	12	% carbon no
5	1	0	0	0	0	0	0	1
6	0	0	0	0	0	0	0	0
7	1	1	0	0	0	0	0	2
8	1	0	0	0	0	0	0	1
9	1	1	0	0	0	0	0	2
10	2	4	1	0	0	0	0	7
11	3	7	4	0	0	0	0	15
12	5	8	7	1	0	0	0	21
13	4	7	7	1	0	0	0	19
14	3	5	5	1	0	0	0	14
15	2	2	3	1	0	0	0	8
16	1	1	1	1	0	0	0	4
17	0	1	1	0	0	0	0	2
18	0	0	0	0	0	0	0	2
19	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	1
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0
% by z No	24	39	30	5	1	1	0	100

API DRUM 3 MERICHEM SAMPLE January 28, 2009

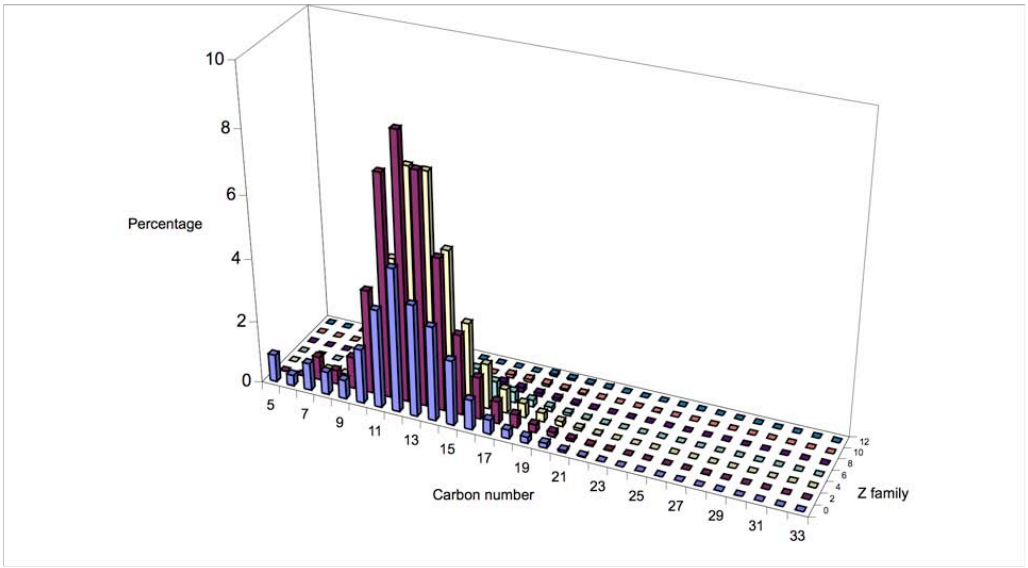
C number	z number							
	0	2	4	6	8	10	12	% carbon no
5	1	0	0	0	0	0	0	1
6	0	0	0	0	0	0	0	0
7	1	1	0	0	0	0	0	2
8	1	0	0	0	0	0	0	1
9	1	1	0	0	0	0	0	2
10	2	3	1	0	0	0	0	6
11	3	7	4	0	0	0	0	14
12	5	8	7	1	0	0	0	21
13	4	7	7	1	0	0	0	19
14	3	5	5	1	0	0	0	14
15	2	3	3	1	0	0	0	8
16	1	1	1	1	0	0	0	5
17	0	1	1	0	0	0	0	3
18	0	0	0	0	0	0	0	2
19	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0
% by z No	24	39	30	5	1	0	0	100



Three-dimensional plot of naphthenic acids sample from drum 1.



Three-dimensional plot of naphthenic acids sample from drum 2.



Three-dimensional plot of naphthenic acids sample from drum 3.

References

Clemente, J.S, N.G.N. Prasad, M.D. MacKinnon & P.M. Fedorak. (2003) A statistical comparison of naphthenic acids characterized by gas chromatography-mass spectrometry. ***Chemosphere 50,*** 1265-1274.

Holowenko, F.M., M.D. MacKinnon & P.M. Fedorak. (2002) Characterization of naphthenic acids in oil sands wastewaters by gas chromatography-mass spectrometry. ***Water Res. 36,*** 2843-2855.

Young, R.F., W.V. Wismer, & P.M. Fedorak. (2008) Estimating naphthenic acids in laboratory-exposed fish and in fish from the wild. ***Chemosphere 73,*** 498-505.

REVISION 4: March 28, 2008 | MATERIAL SAFETY DATA SHEET | Page 1/6

1 IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY

1.1	Identification of the Product:	**Naphthenic Acids (Carboxylic Acids, Fatty Acids)**
1.2	Product Code:	NAP ACID
1.3	Company:	
1.4	Transportation Emergency:	USA 1-800-424-9300 (CHEMTREC)
1.5	Product Information:	
1.6	Intended Use :	For industrial use only. No other use is intended.

2 HAZARDS IDENTIFICATION

2.1	Classification:	Irritant (Xi). Harmful (Xn).
2.2	Warning Statements:	Causes eye and skin irritation. Harmful if swallowed – may enter lungs if swallowed or vomited. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract.
2.3	Hazard Symbol(s):	
2.4	Risk Phrase(s):	R36/38 (Irritating to eyes and skin). R65 (Harmful: May cause lung damage if swallowed).
2.3	Potential Health Effects:	
	Eye Contact:	Causes eye irritation. Exposure may cause irritation, redness and tearing.
	Skin Contact:	Causes skin irritation. Exposure may cause redness, itching and inflammation.
	Ingestion:	Expected to be a low ingestion hazard. Aspiration hazard. If swallowed, can enter lungs and cause damage.
	Inhalation:	High vapor concentrations may cause drowsiness, respiratory tract irritation, coughing, asthmatic breathing and breathlessness.
	Chronic Effects:	No known deleterious effects.
2.4	Other Hazards:	Target organs: Eyes, skin and central nervous system.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Substance	CAS No.	EC No.	% Present
Naphthenic Acid	1338-24-5	215-662-8	70 - 99
Petroleum Distillates	8008-20-6	232-366-4	1 - 30

4 FIRST-AID MEASURES

In case of contact with eyes:	Promptly flush eyes with running water for 15 minutes, including under eyelids. Seek medical assistance if irritation develops.
In case of contact with skin:	Wash affected area well with soap and water. Seek medical assistance if irritation develops.
In case of ingestion:	Do not induce vomiting. Give 2-3 glasses of milk or water to dilute. Contact physician or poison control center promptly for instructions. If vomiting occurs, keep head lower than hips to help prevent aspiration. Never give anything by mouth to an unconscious person.
In case of inhalation:	Remove to fresh air. Seek medical assistance if irritation develops.

5 FIRE-FIGHTING MEASURES

5.1	Suitable extinguishing media:	Water fog, fire fighting foam, dry chemical or carbon dioxide.
5.2	Unsuitable extinguishing media:	None
5.3	Specific hazards:	Combustion products are Carbon Oxides.
5.4	Personal protective equipment:	Wear Self Contained Breathing Apparatus and protective clothing appropriate for fire-fighting.
5.5	Other precautions:	Non-emergency personnel should be removed from the area immediately. Cool fire-exposed containers with water spray. Prevent water runoff from reaching drains, surface water and ground water.

6 ACCIDENTAL RELEASE MEASURES

6.1	Personal precautions:	Avoid unnecessary exposure by wearing personal protective equipment specified in Section 8. Remove material from eyes, skin and clothing.
6.2	Spill cleanup:	Suction up free liquids using non-sparking equipment. Liquid unable to be suctioned may be absorbed with a non-combustible material (vermiculite, sand, earth, etc.) and transferred to container(s) for later disposal. Remove contaminated sand, earth, etc. and transfer to container(s) for later disposal.
6.3	Environmental precautions:	Keep away from drains, surface water and ground water.

7 HANDLING AND STORAGE

7.1 Handling: Wear appropriate personal protective equipment (see Section 8).

Avoid breathing vapors, mists or spray. Use with adequate ventilation.

Avoid contact with eyes, skin and clothing.

Wash thoroughly after handling.

Do not taste or swallow.

7.2 Storage: Store in a sealed container in a clean, dry, well-ventilated area away from oxidizers, strong bases, heat and flame.

Avoid use of copper and brass alloys in storage and transfer equipment and process equipment.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Engineering controls: Use local exhaust ventilation to control emissions at source.

8.2 Eye/face protection: Wear safety glasses with side shields as minimum protection. Wear goggles or faceshield if a risk of splashing exists.

8.3 Skin protection: Wear chemical resistant gloves. Heavy PVC, butyl rubber or Viton are recommended.

8.4 Respiratory protection: An approved respirator must be worn if engineering controls do not maintain airborne concentrations below established exposure limits or, when limits have not been established, below irritant levels. Respirator selection must be based upon the airborne concentration. Consult a health and safety professional or manufacturer for specific recommendations.

8.5 Thermal hazards: None

8.6 Occupational Exposure Levels

Chemical Name	Source	Type	Exposure Limits	Notes
Cherosene (Non-Aerosol), Come Vapore totale Dell'Idrocarburo	Italy OEL's	TWA	200 mg/m^3	Skin Total Hydrocarbon Vapor
Kerosene	Poland MAC's	TWA	100 mg/m^3	
	Poland MAC's	STEL	300 mg/m^3	
Kerosine	Russian Federation MAC's	Ceiling	300 mg/m^3	As C
	Russian Federation MAC's	TWA	600 mg/m^3	As C
Kerosene (Non-Aerosol), As Total Hydrocarbon Vapor	ACGIH	TWA	200 mg/m^3	Irritation, CNS, Skin
Kerosene	NIOSH	REL	100 mg/m^3	

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance: Amber color

9.2 Odour: Hydrocarbon

9.3 pH: 5.2 (Saturated Solution)

9.4 Boiling Pt./range: 268°C (515°F)

9.5 Freezing Pt./Range: Not established

9.6 Flash point: >149°C (300°F)

9.7 Flammability: See 9.6

9.8 Autoflammability: See 9.6

9.9 Explosive properties: Not applicable

9.10 Oxidizing properties: Not an oxidizer

9.11 Vapor pressure: 0.005 mm Hg (37.8°C/100°F)

9.12 Relative density (H_2O = 1): 0.960 – 0.982 (15.6°C/60°F)

9.13 Apparent density: Not applicable

9.14 Vapor density (Air = 1): 6.5

9.14 Solubility:
Water - <1% by weight (15.6°C/60°F)
Fat (type) - Not determined
Other solvents - Not determined

9.15 Partition coefficient: Log $P_{o/w}$ (Octanol/water) - Not determined

9.16 Other data: Not Applicable

10 STABILITY AND REACTIVITY

10.1	Reactivity:	Not reactive under specified conditions of storage, shipment and use.
10.2	Stability:	Stable under specified conditions of storage, shipment and use.
10.3	Conditions to avoid:	Heat and ignition sources.
10.4	Incompatible materials:	Strong oxidizers and strong bases.
10.5	Hazardous decomposition products:	Carbon Oxides.

11 TOXICOLOGICAL INFORMATION

11.1 Acute: Eye and skin irritant. Not established as a respiratory tract irritant. May cause lung damage if aspirated.

Specified Substances

Chemical Name	Test Results
Kerosene	Dermal LD_{50} (Rabbit): >2000 mg/kg
	Oral LD_{50} (Rat): >5000 mg/kg
	Inhalation LC_{50}: >5000 mg/m^3, 4 H
	Skin (Rabbit): 500 mg (Severe Irritation)
	Skin (Rabbit): 100%/24 H (Moderate Irritation)
Naphthenic Acid	Oral LD_{50} (Rat): 3000 mg/kg
	Oral LD_{50} (Rat): 5880 mg/kg
	Dermal LD_{50} (Rabbit): >3160 mg/kg
	Eye (Rabbit): Moderate
	Skin Occluded (Rabbit): Moderate to Severe
	Skin (Rabbit): Slight

11.2 Chronic: Neither ingredient is listed by NTP, IARC or OSHA as a carcinogen. Kerosene (Non-Aerosol), as total hydrocarbon vapor, is listed by ACGIH as A3 (Confirmed Animal Carcinogen).

12 ECOLOGICAL INFORMATION

12.1	Ecotoxicity:	No data available.
12.2	Persistence and degradability:	No data available.
12.3	Bioaccumulation potential:	No data available.
12.4	Mobility in soil:	No data available.
12.5	Other adverse effects:	No data available.

13 DISPOSAL CONSIDERATIONS

Generators of waste material are responsible for evaluating materials for compliance with all applicable procedures and regulations. Disposal of unused materials must be in accordance with all local, state and federal regulations. Containers should be cleaned of residual product and rinsed according to all local, state and federal regulations prior to disposal.

14 TRANSPORT INFORMATION

	UN Number	Proper Shipping Name	Hazard Class(es)	Packing Group
ADR/RID:	Not regulated			
IMO/IMDG:	Not regulated	Fatty Acids (Saturated C13+)		
IATA:	Not regulated			
DOT:	NA3082	Other Regulated Substances, Liquid, n.o.s., (Naphthenic Acid)	9	III

Note: Material is regulated by DOT only if shipped in a container containing an amount equal to or greater than the Reportable Quantity (RQ) of 100-pounds.

15 REGULATORY INFORMATION

Warning symbol:



Warning words: Harmful. Irritant.

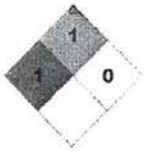
Risk phrases: R36/38: Irritating to eyes and skin
R65: May cause lung damage if swallowed

Safety phrases: S23: Do not breathe vapor
S24/25: Avoid contact with eyes and skin
S62: If swallowed, do not induce vomiting. Seek medical advice immediately and show this container or label

HMIS ratings (estimated):



NFPA ratings (estimated):



SARA : Section 302: None
Section 311/312: Immediate Health Hazard
Section 313: None

WHMIS: D2B

Inventories:

CAS Number	TSCA	DSL	EINECS
1338-24-5	Yes	Yes	Yes
8008-20-6	Yes	Yes	Yes

16 OTHER INFORMATION

Revision Date: March 28, 2008

Supercedes Revision Date: November, 2004

Revisions: The latest informational changes are indicated by 20% shading.

The information on this form is furnished solely for the purpose of enabling those who transport, handle or use our products to ensure the safety and health of their employees and to comply [illegible] and local). This information is offered in good faith and is believed to be accurate. [illegible]owever, makes no guarantee or warranty, expressed or implied, regarding the accuracy or these data or the results to be obtained from the use hereof.

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- Some may burn but none ignite readily.
- Containers may explode when heated.
- Some may be transported hot.

HEALTH

- Inhalation of material may be harmful.
- Contact may cause burns to skin and eyes.
- Inhalation of Asbestos dust may have a damaging effect on the lungs.
- Fire may produce irritating, corrosive and/or toxic gases.
- Some liquids produce vapors that may cause dizziness or suffocation.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Spill

- See the Table of Initial Isolation and Protective Action Distances for highlighted substances. For non-highlighted substances, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY"

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fires

- Dry chemical, CO_2, water spray or regular foam.

Large Fires

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Do not scatter spilled material with high pressure water streams.
- Dike fire-control water for later disposal.

Fire involving Tanks

- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Prevent dust cloud.
- Avoid inhalation of asbestos dust.

Small Dry Spills

- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

Small Spills

- Take up with sand or other non-combustible absorbent material and place into containers for later disposal.

Large Spills

- Dike far ahead of liquid spill for later disposal.
- Cover powder spill with plastic sheet or tarp to minimize spreading.
- Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID

- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

APPENDIX D

Analyses of Dosing Formulations (WIL Research Laboratories, LLC)

A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats

Analyses of Dosing Formulations

Analytical Chemistry Department

WIL Research Laboratories, LLC



TABLE OF CONTENTS

Page

Table of Contents **2**
Index of Figures **3**
Index of Tables **3**
Index of Attachments **4**
1. Summary **5**
2. Introduction **6**
2.1. Key Study Dates 7
2.2. WIL Research Key Study Personnel 7
3. Experimental Procedures - Materials and Methods **7**
3.1. Internal Standard Identification 7
3.2. Gas Chromatography 8
3.3. Mass Spectrometry 8
3.4. Preparation of Internal Standard Stock Solution 9
3.5. Preparation of Diluent 9
3.6. Preparation of Calibration Stock Solution and Samples 9
3.7. Preparation of Quality Control Stock Solution and Samples 10
3.8. Processing of Formulation Samples 11
3.9. Sample Processing 11
3.10. Calibration and Quantitation 12
4. Results and Discussion **12**
4.1. Specificity/Selectivity 17
4.2. Assay Acceptability 17
4.3. Test Substance Stability in Calibration Standards 17
4.4. Test Substance Stability in Processed Samples 17
4.5. Test Substance Homogeneity and Resuspension Homogeneity Assessment of Formulations 18
4.6. Test Substance Concentration in Formulations 20

Page

5. Conclusion 20
6. Report Review and Approval 22
7. References 23
8. Abbreviations 24

INDEX OF FIGURES

1. Representative Chromatogram of a 150 µg Naphthenic Acid/mL Calibration Sample 13
2. Representative Chromatogram of a Processed 125 mg Naphthenic Acid/mL Quality Control Sample 14
3. Representative Chromatogram of a Processed 90 mg Naphthenic Acid/mL Formulation Sample.....15
4. Chromatogram of a Processed Vehicle Blank Sample 16

INDEX OF TABLES

1. Minimum 2-Day Room Temperature Processed Sample Stability Data 26
2. Minimum 7-Day Room Temperature Processed Sample Stability Data 27
3. Homogeneity/Concentration Assessment of the 22 September 2010 Formulations 28
4. Homogeneity Assessment of the 22 September 2010 Formulations - Back-Up Samples.....30
5. 8-Day Resuspension Homogeneity Assessment of the 22 September 2010 Formulations 31
6. Concentration Assessment of the 29 September 2010 Formulations 32

Page

7. Concentration Assessment of the 6 October 2010 Formulations 33

8. Concentration Assessment of the 13 October 2010 Formulations 34

9. Concentration Assessment of the 20 October 2010 Formulations 35

10. Concentration Assessment of the 27 October 2010 Formulations - Back-Up Samples 36

11. Concentration Assessment of the 3 November 2010 Formulations 37

12. Concentration Assessment of the 10 November 2010 Formulations 38

INDEX OF ATTACHMENTS

I. Certificate of Analysis 39

1. SUMMARY

A gas chromatography method using mass spectrometric detection for the determination of naphthenic acid concentration in corn oil formulations containing test substance ranging in concentration from 2.50 to 125 mg/mL was validated in a previous study (Kuhl, 2010, WIL-402010). In the present study, test substance stability was assessed in calibration standards and processed quality control (QC) samples stored at room temperature for a minimum of 7 days. In addition, test substance homogeneity and, following 8 days of room temperature storage, resuspension homogeneity were assessed in formulations prepared at target concentrations of 10, 30, and 90 mg naphthenic acid/mL. Finally, formulations used for dose administration were analyzed to verify test substance concentration acceptability.

The test substance in calibration standards and processed QC samples stored at room temperature for a minimum of 7 days met the WIL Research SOP acceptance criteria for stability, *i.e.*, the post-storage concentration was not <90% of the pre-storage value.

The results of the test substance homogeneity assessment in formulations prepared at target concentrations of 10, 30, and 90 mg naphthenic acid/mL met the WIL Research SOP acceptance criteria, *i.e.*, the relative standard deviation (RSD) for the mean concentration was ≤10% at a concentration within the acceptable limits (85% to 115% of target) with the following exceptions. The 30 mg/mL formulation prepared on 22 September 2010 had an RSD of 11% and was 119% of the target concentration. Also, the 90 mg/mL formulation prepared on 22 September 2010 was 129% of the target concentration. The back-up samples were analyzed and met the previously mentioned criteria for homogeneity. Assessment of test substance resuspension homogeneity in formulations prepared at target concentrations of 10, 30, and 90 mg naphthenic acid/mL and following 8 days of room temperature storage met the WIL Research SOP acceptance criteria for resuspension homogeneity, *i.e.*, the RSD for the mean concentration was ≤10%.

The analyzed formulations used for dose administration met the WIL Research SOP requirement for concentration acceptability for suspension formulations, *i.e.*, the analyzed concentration was 85% to 115% of the target concentration. No test substance was detected in the analyzed vehicle administered to the control group.

2. INTRODUCTION

This report provides a detailed description of a validated gas chromatography (GC) method using mass spectrometric detection for the determination of naphthenic acid concentration in corn oil formulations containing test substance ranging in concentration from 2.50 to 125 mg/mL. The method was validated in a previous study (Kuhl, 2010, WIL-402010) where assay specificity/selectivity, calibration reproducibility, precision, accuracy, and ruggedness were assessed. Also in the previous study, formulations prepared at target concentrations of 3 and 100 mg naphthenic acid/mL were analyzed to assess test substance homogeneity and, following 11 days of room temperature storage, resuspension homogeneity and stability. In the present study, test substance stability in calibration standards and processed quality control (QC) samples stored at room temperature for a minimum of 7 days were assessed. In addition, formulations prepared at target concentrations of 10, 30, and 90 mg naphthenic acid/mL were analyzed to assess test substance homogeneity and, following 8 days of room temperature storage, resuspension homogeneity. Finally, formulations used for dose administration were analyzed to verify test substance concentration acceptability.

A list of abbreviations potentially used in this report is presented in Section 8. (Abbreviations).

2.1. KEY STUDY DATES

Date(s)	Event(s)
22 September 2010	First date of analysis
11 November 2010	Last date of analysis

2.2. WIL RESEARCH KEY STUDY PERSONNEL

[redacted]	Associate Research Chemist, Analytical Chemistry
	Assistant Director, Analytical Chemistry
	Chemist II, Analytical Chemistry
	Group Supervisor, Reporting & Technical Support Services
[redacted]	WIL Research-US Manager, Computerized Systems Validation

3. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

3.1. INTERNAL STANDARD IDENTIFICATION

The internal standard (IS) used for calibration standards, QC samples, and formulation samples was received from Sigma-Aldrich, St. Louis, MO on 15 April 2010 as follows:

Identification	Quantity Received	Physical Description
Fluorine-9-carboxylic acid, 97% (9-FCA) Lot No. 03706KH [WIL log no. ACC 13364]	1 Bottle Net weight: 10 g	Light yellow powder

A Certificate of Analysis for the IS was provided by the supplier and is presented in Attachment I. The IS was stored at room temperature.

3.2. GAS CHROMATOGRAPHY

Instrument:	Varian CP-3800 gas chromatograph (GC) equipped with a Varian 4000 ion-trap mass spectrometer (MS), an autosampler, and Varian MS Workstation data system, or equivalent
Column:	Varian VF-5MS column, 30 m × 0.25 mm ID, 0.25-µm film-thickness
Temperature Program:	Initial temperature 100°C, hold for 3.0 minutes Ramp at 20°C/minute to 300°C, hold for 2.0 minutes
Carrier Gas:	Helium
Carrier Gas Pressure:	10.0 psi
Injector Temperature:	250°C
Injection Volume:	1.0 µL splitless
Purge Flow:	50 psi at 1.0 minute
Retention Times:	Approximately 10.2 minutes for naphthenic acid Approximately 11.9 minutes for 9-FCA (IS)
Run Time:	15 minutes

3.3. MASS SPECTROMETRY

Acquisition Parameters

Solvent Delay:	5.0 minutes
Ion Source:	Electron impact
Scan Range:	250-350 m/z
Transfer Line Temperature:	280°C
Trap Temperature:	210°C
Manifold Temperature:	60°C

Analyte	Mass (m/z)
Naphthenic Acid	257.3
9-FCA	267.4

3.4. PREPARATION OF INTERNAL STANDARD STOCK SOLUTION

The internal standard stock solution was prepared at a concentration of 0.100 mg 9-fluorenecarboxylic acid (9-FCA)/mL as follows. Approximately 10 mg of 9 FCA was accurately weighed in a tared glass weigh funnel and transferred to a 100-mL volumetric flask with rinses of methylene chloride. Approximately 75 mL of methylene chloride was added to the flask, and the preparation was mixed and sonicated as needed to achieve complete dissolution of the IS. Additional methylene chloride was added to yield the desired concentration, and the solution was thoroughly mixed.

3.5. PREPARATION OF DILUENT

The diluent was prepared by thoroughly mixing methylene chloride and corn oil in a 90:10 (v/v) ratio.

3.6. PREPARATION OF CALIBRATION STOCK SOLUTION AND SAMPLES

The calibration stock solution was prepared at a concentration of 1.00 mg naphthenic acid/mL as follows. Approximately 50 mg of naphthenic acid (WIL ID no. 10006B, no correction for purity) was accurately weighed in a tared glass weigh funnel and transferred to a 50-mL volumetric flask with rinses of methylene chloride. Approximately 40 mL of methylene chloride was added to the flask, and the preparation was mixed and sonicated as needed to achieve complete dissolution of the test substance. Additional methylene chloride was added to yield the desired concentration, and the solution was thoroughly mixed.

As detailed in the following table, matrix-based calibration samples were prepared by combining aliquots of the calibration stock solution, corn oil (vehicle), and methylene chloride in polypropylene tubes. The tubes were capped and mixed with vortex action. The samples were further processed as described in Section 3.9. (Sample Processing). At least single calibration samples at each concentration were prepared for routine analyses.

Test Substance Concentration (µg/mL)	Calibration Stock Volume (mL)	Methylene Chloride Volume (mL)	Corn Oil Volume (mL)
150	0.150	0.750	0.100
200	0.200	0.700	0.100
250	0.250	0.650	0.100
300	0.300	0.600	0.100
350	0.350	0.550	0.100

3.7. PREPARATION OF QUALITY CONTROL STOCK SOLUTION AND SAMPLES

The QC stock solution was prepared at a concentration of 125 mg naphthenic acid/mL as follows. Approximately 0.625 g of naphthenic acid (WIL ID no. 10006B, no correction for purity) was accurately weighed in a tared glass weigh funnel and transferred to a 5-mL volumetric flask with rinses of methylene chloride. Approximately 2 mL of methylene chloride was added, and the preparation was mixed and sonicated as needed to achieve complete dissolution of the test substance. Additional methylene chloride was added to yield the desired concentration, and the solution was thoroughly mixed.

As detailed in the following table, QC samples were prepared to simulate the processing of formulations at concentrations of 2.50, 25.0, and 125 mg/mL (nominal QC concentration) by combining aliquots of the QC stock solution, corn oil (vehicle), and methylene chloride in polypropylene tubes. The samples were mixed with vortex action and/or inversion. The samples were further diluted as necessary with diluent. The samples were processed as described in Section 3.9. (Sample Processing). Triplicate QC samples at each concentration were prepared; a single blank sample was prepared.

QC Level	Nominal QC Concentration (mg/mL)	Vehicle Volume (mL)	QC Stock Volume (mL)	Methylene Chloride Volume (mL)	Secondary Dilution	Theoretical Final Concentration (µg/mL)
Blank	0	1.0	0	9.00	NA	0
1	2.50	1.0	0.020	8.98	NA	250
2	25.0	1.0	0.200	8.80	10-fold	250
3	125	1.0	1.00	8.00	50-fold	250

NA = Not applicable

3.8. PROCESSING OF FORMULATION SAMPLES

Quadruplicate formulations samples were collected using a syringe and cannula and placed in polypropylene tubes. Two samples from each quadruplicate set were processed for analysis and the remaining 2 samples (back-up samples) were stored at room temperature and discarded, if not processed for analysis, after the Study Director's approval of the results. As detailed in the following table, methylene chloride was added to the formulations samples and the samples were mixed with vortex action and/or inversion. The samples were further diluted with diluent. The samples were further processed as described in Section 3.9. (Sample Processing).

Sample Concentration (mg/mL)	Sample Volume (mL)	Methylene Chloride Volume (mL)	Secondary Dilution	Theoretical Final Concentration (µg/mL)
0	1.00	9.0	4-fold	0
10	1.00	9.0	4-fold	250
30	1.00	19.0	6-fold	250
90	1.00	19.0	18-fold	250

3.9. SAMPLE PROCESSING

Calibration, QC, and formulation samples were processed by combining 50.0 µL of each sample, 10.0 µL of the IS stock solution, and 50.0 µL of N-methyl-N-(t-butyldimethylsilyl)trifluoroacetamide (MTBSTFA) containing 1% t-butyldimethylsilylchloride in a glass conical autosampler vial. The samples were capped and mixed with vortex action for approximately 20 minutes at approximately

60°C. The caps were removed and the samples were evaporated to dryness under a stream of nitrogen. The samples were reconstituted with 0.500 mL of methylene chloride and mixed with vortex action.

3.10. CALIBRATION AND QUANTITATION

Single injections were made of each calibration, QC, and formulation sample. A calibration curve was constructed for each set of analyses. The naphthenic acid/IS peak area ratios (y) and the theoretical concentrations (x) of the calibration samples were fit with least-squares regression to the quadratic function:

$$y = ax^2 + bx + c$$

Concentrations were back-calculated from the results of the regression analysis using Microsoft® Excel. The concentration data were transferred to another Excel spreadsheet, where appropriate summary statistics, *i.e.*, mean, standard deviation (SD), relative standard deviation (RSD), and concentration as a percent of target, were calculated and presented in tabular form. The concentrations of the formulation and QC samples were calculated by applying any necessary multiplication factors to correct for dilution and/or unit conversions.

4. RESULTS AND DISCUSSION

Under the described chromatographic conditions, the retention time of the test substance and IS were approximately 10.2 and 11.9 minutes, respectively. Figure 1, Figure 2, Figure 3, and Figure 4 are typical chromatograms of a calibration sample, a processed QC sample, a processed formulation sample, and a processed vehicle blank sample, respectively. The total analysis time required for each run was 15 minutes.

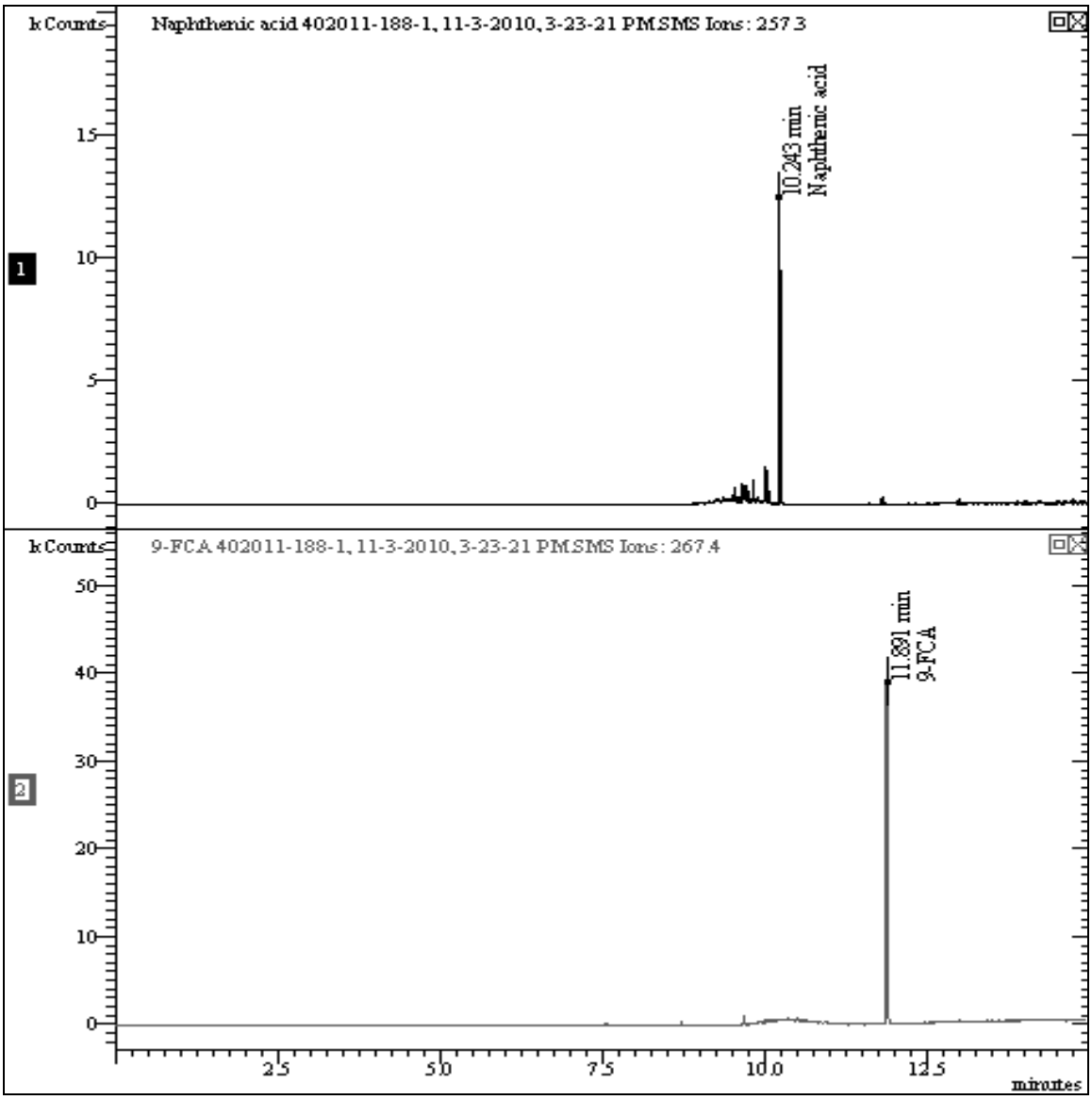


Figure 1: Representative Chromatogram of a 150 µg Naphthenic Acid/mL Calibration Sample

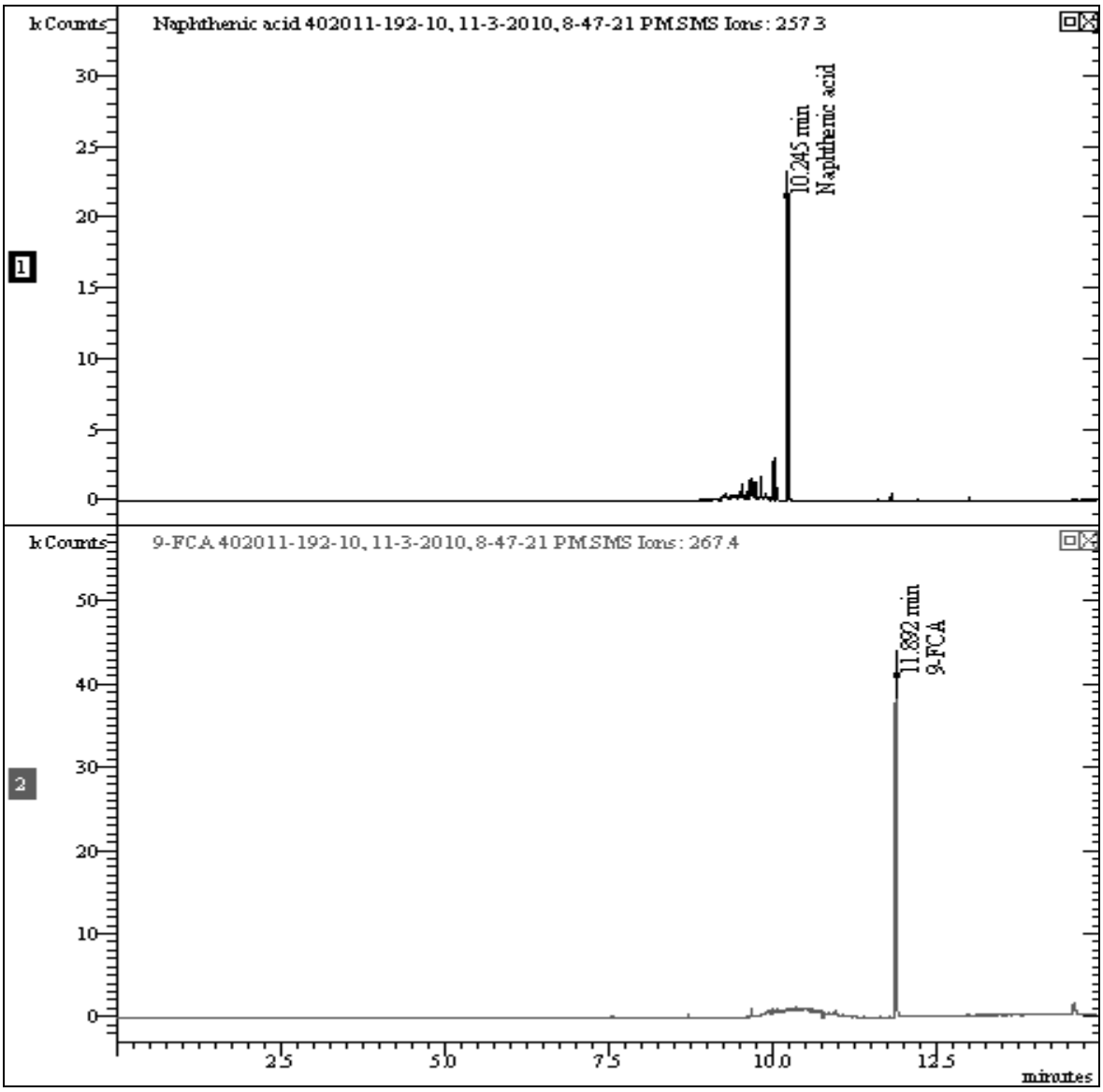


Figure 2: Representative Chromatogram of a Processed 125 mg Naphthenic Acid/mL Quality Control Sample

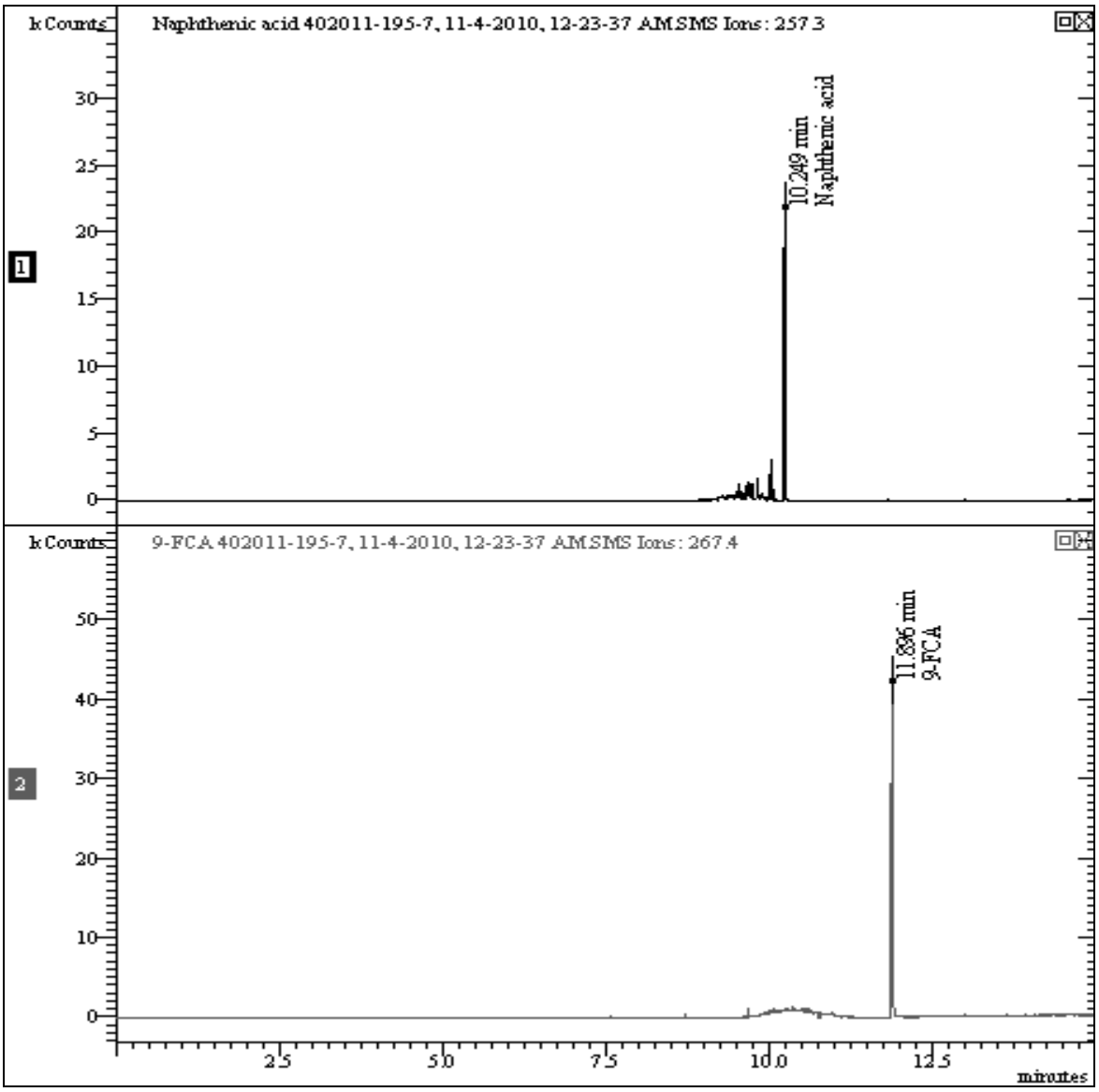


Figure 3: Representative Chromatogram of a Processed 90 mg Naphthenic Acid/mL Formulation Sample

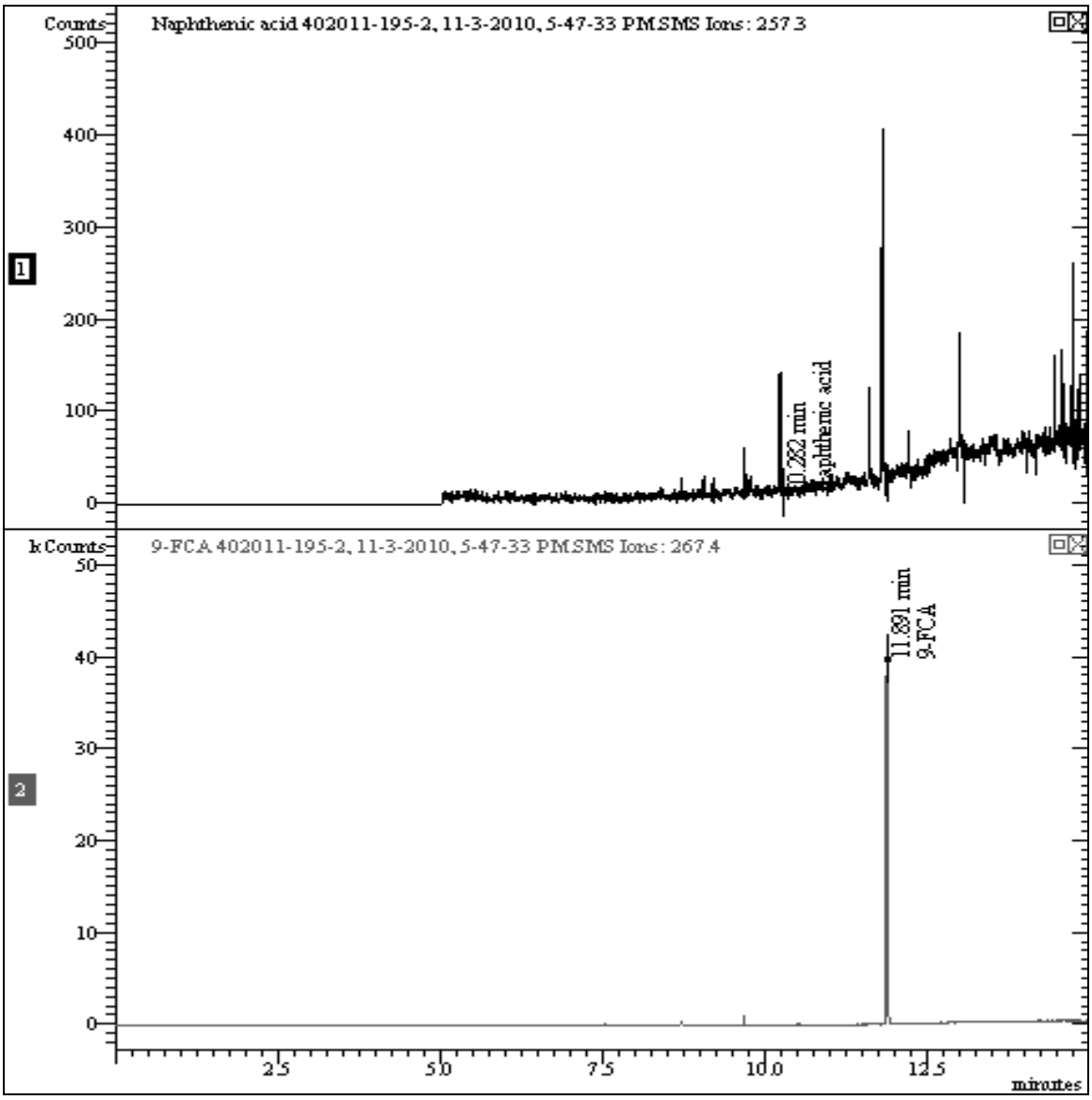


Figure 4: Chromatogram of a Processed Vehicle Blank Sample

4.1. SPECIFICITY/SELECTIVITY

As shown in Figure 4 (and in contrast to the chromatograms shown in Figure 1, Figure 2, and Figure 3), assay specificity/selectivity was confirmed when GC/MS analysis of processed vehicle blank samples revealed that there were no quantifiable peaks (with signal-to-noise ratio [S/N] >10) at or near the retention time for the test substance and IS (approximately 10.2 and 11.9 minutes, respectively).

4.2. ASSAY ACCEPTABILITY

In addition to the experimental samples, each analytical session consisted of (but was not limited to) calibration samples at 5 concentrations and triplicate QC samples prepared at each of 3 concentrations. In this study, the formulations were prepared at target concentrations of 0, 10, 30, and 90 mg naphthenic acid/mL, and the QC samples were prepared at nominal concentrations of 2.50, 25.0, and 125 mg naphthenic acid/mL. For an analytical session to be considered valid, at least two-thirds of the calculated QC concentrations with at least 1 sample at each concentration had to be 85% to 115% of the nominal QC concentration. All reported results were from analytical sessions that met the acceptance criteria.

4.3. TEST SUBSTANCE STABILITY IN CALIBRATION STANDARDS

Calibration standards prepared at 150 and 350 µg/mL and analyzed on 22 September 2010 were stored at room temperature for at least 7 days before being re-analyzed to assess test substance stability. The mean post-storage concentrations ranged from 93.7% and 109% of the pre-storage values (Table 1 and Table 2), which met the WIL Research SOP requirement for stability, *i.e.*, the mean post-storage concentration was not <90% of the pre-storage value.

4.4. TEST SUBSTANCE STABILITY IN PROCESSED SAMPLES

QC samples prepared at nominal test substance concentrations of 2.50 and 125 mg/mL were processed on 22 December 2010. The processed samples were stored at room temperature for at least 7 days before being re-analyzed to assess test substance stability.

The mean post-storage concentrations were 93.9% and 108% of the pre-storage values (Table 1 and Table 2), which met the previously stated WIL Research SOP requirement for stability.

4.5. TEST SUBSTANCE HOMOGENEITY AND RESUSPENSION HOMOGENEITY ASSESSMENT OF FORMULATIONS

Duplicate samples from the top, middle, and bottom strata of the formulations prepared on 22 September 2010 at target test substance concentrations of 10, 30, and 90 mg/mL were analyzed to assess test substance homogeneity. Duplicate samples from the middle stratum of the control formulation were also collected and analyzed. The formulations that remained after sampling were divided into aliquots as would be used for daily dispensation. Representative aliquots were stored at room temperature for 8 days, at which time the test substance was resuspended by stirring. Duplicate samples were collected from the top and bottom strata of the aliquots and analyzed to assess 8-day resuspension homogeneity. The results of the homogeneity and resuspension homogeneity analyses are presented in Table 3, Table 4, and Table 5, with the overall statistics summarized as follows:

Homogeneity Assessment of the 22 September 2010 Formulations

	Group 2 (0 mg/mL)	Group 3 (10 mg/mL)	Group 4 (30 mg/mL)	Group 5 (90 mg/mL)
Mean Concentration (mg/mL)	NQ	10.9	35.6	116
SD	NA	0.55	3.9	6.4
RSD (%)	NA	5.1	11	5.5
Mean Concentration % of Target	NA	109	119	129

NQ = No quantifiable test substance chromatographic peak
NA = Not applicable

Homogeneity Assessment of the 22 September 2010 Formulations (Back-Up Samples)

	Group 4 (30 mg/mL)	Group 5 (90 mg/mL)
Mean Concentration (mg/mL)	25.6	77.3
SD	2.6	6.8
RSD (%)	10	8.8
Mean Concentration % of Target	85.2	85.9

8-Day Room Temperature Resuspension Homogeneity Assessment of the 22 September 2010 Formulations

	Group 3 (10 mg/mL)	Group 4 (30 mg/mL)	Group 5 (90 mg/mL)
Mean Concentration (mg/mL)	9.99	29.7	90.7
SD	0.34	0.46	3.0
RSD (%)	3.4	1.6	3.3
Mean Concentration % of Target	99.9	99.1	101

The homogeneity assessment of the 22 September 2010 formulations met the WIL Research SOP requirement, *i.e.*, the RSD for the mean concentration was ≤10% at a concentration within the acceptable limits (within 85% to 115% of target concentration) with the following exceptions. The 30 mg/mL formulation had an RSD of 11% and was 119% of the target concentration. Also, the 90 mg/mL formulation was 129% of the target concentration. The back-up samples were analyzed and met the previously mentioned criteria for homogeneity. The resuspension homogeneity assessments of the 22 September 2010 formulations met the WIL Research SOP requirement, *i.e.*, the RSD for the mean concentration was ≤10%.

4.6. TEST SUBSTANCE CONCENTRATION IN FORMULATIONS

Formulations used for dose administration were analyzed to assess test substance concentration acceptability. The results of the concentration acceptability assessments are presented in Table 6 through Table 12 with the mean concentration and percent of target values summarized in the following table.

Date of Preparation	Mean Concentration, mg/mL (% of Target)			
	Group 2 (0 mg/mL)	Group 3 (10 mg/mL)	Group 4 (30 mg/mL)	Group 5 (90 mg/mL)
29 September 2010	ND	9.91 (99.1)	30.6 (102)	90.7 (101)
6 October 2010	ND	9.40 (94.0)	29.1 (97.1)	84.5 (93.9)
13 October 2010	ND	9.18 (91.8)	28.5 (95.1)	85.3 (94.8)
20 October 2010	ND	10.5 (105)	33.3 (111)	93.2 (104)
27 October 2010	ND	10.8 (108)	30.1 (100)	101 (112)
3 November 2010	ND	9.78 (97.8)	30.2 (101)	90.1 (100)
10 November 2010	---	---	29.3 (97.6)	76.5 (85.0)

ND = No test substance chromatographic peak detected
"---" = Formulation not prepared or analyzed

The analyzed formulations used for dose administration met the WIL Research SOP requirement for concentration acceptability for suspension formulations, *i.e.*, the analyzed concentration was 85% to 115% of the target concentration. No test substance was detected in the analyzed vehicle administered to the control group (Group 1).

5. CONCLUSION

A validated GC/MS method was used for the determination of naphthenic acid concentration in corn oil formulations. Test substance stability was assessed and verified in calibration standards and processed samples following a minimum of 7 days of room temperature storage. The analytical results met the applicable WIL Research SOP acceptance criteria for test substance homogeneity and, following 8 days of room temperature storage, resuspension homogeneity with the following exceptions.

The 30 mg/mL formulation had an RSD of 11% and was 119% of the target concentration. Also, the 90 mg/mL formulation was 129% of the target concentration. The back-up samples were analyzed and met the previously mentioned criteria for homogeneity. In addition, analyzed formulations used for dose administration met the applicable WIL Research SOP acceptance criteria for test substance concentration acceptability. No test substance was detected in the analyzed vehicle administered to the control group.

6. REPORT REVIEW AND APPROVAL

WIL-402011 Analytical Chemistry Report

Report Reviewed and Approved by:

[redacted]

30 Aug 2012
Date

Staff Toxicologist, Developmental
and Reproductive Toxicology
Study Director

Report Prepared by:

[redacted]

30 Aug 2012
Date

Assistant Director, Analytical Chemistry

7. REFERENCES

[redacted] An Oral (Gavage) 14-Day and Pilot Prenatal Developmental Toxicity Study of Naphthenic Acid in Rats (Study No. WIL-402010). WIL Research Laboratories, LLC, Ashland, OH, **2010.**

8. ABBREVIATIONS

The following abbreviations may apply to this report:

µ	-	micro
µL	-	microliter
ACN	-	acetonitrile
btm	-	bottom
cm	-	centimeter
conc.	-	concentration
DI	-	deionized
DMSO	-	dimethylsulfoxide
ESI+	-	positive electrospray ionization
FA	-	formic acid
g	-	gram
HPLC	-	high performance liquid chromatography
hr	-	hour(s)
IS	-	internal standard
kg	-	kilogram
L	-	liter
LLOQ	-	lower limit of quantitation
MC	-	methylcellulose
MeOH	-	methanol
mg	-	milligram
mL	-	milliliter
mm	-	millimeter
msec	-	milliseconds
MS	-	mass spectrometry
mM	-	millimolar
NA	-	not applicable
ND	-	not detected
ng	-	nanogram
QC	-	quality control
%RE	-	percent relative error
RSD	-	relative standard deviation
SD	-	standard deviation
SOP	-	standard operating procedure
SPE	-	solid phase extraction
UV	-	ultraviolet
v	-	volume
w	-	weight
WIL Research	-	WIL Research Laboratories, LLC

TABLES 1 - 12

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 1. Minimum 2-Day Room Temperature Processed Sample Stability Data

(Analyzed 25 September 2010)

Storage Duration (Days)	Analysis Date	Ref. # (402011-)	Line #	Calculated Concentration	Mean Conc	% of Time Zero (%)	Mean % of Time Zero (%)
150 µg/mL Standard			(402011a-)	(µg/mL)	(µg/mL)		
0	22 Sep 10	4-2	10	154	152	NA	
		4-3	11	149		NA	
			(402011b-)				
2	25 Sep 10	4-2	50	163	158	106	104
		4-3	51	153		103	
350 µg/mL Standard			(402011a-)				
0	23 Sep 10	4-14	22	331	356	NA	
		4-15	23	381		NA	
			(402011b-)				
2	25 Sep 10	4-14	52	365	389	110	109
		4-15	53	412		108	
2.50 mg/mL Quality Control			(402011a-)	(mg/mL)	(mg/mL)		
0	23 Sep 10	8-3	30	2.72	2.65	NA	
		8-4	31	2.58		NA	
			(402011b-)				
2	25 Sep 10	8-3	54	2.78	2.66	102	100
		8-4	55	2.55		98.7	
125 mg/mL Quality Control			(402011a-)				
0	23 Sep 10	8-9	36	121	123	NA	
		8-10	37	125		NA	
			(402011b-)				
2	25 Sep 10	8-9	56	128	133	106	108
		8-10	57	138		110	

NA = Not Applicable

402011 results.xls 2PSS
Printed: 13Mar2011 1:06 PM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 2. Minimum 7-Day Room Temperature Processed Sample Stability Data

(Analyzed 29 September 2010)

Storage Duration (Days)	Analysis Date	Ref. # (402011-)	Line #	Calculated Concentration	Mean Conc	% of Time Zero (%)	Mean % of Time Zero (%)
150 µg/mL Standard			(402011a-)	(µg/mL)	(µg/mL)		
0	22 Sep 10	4-2	10	154	152	NA	
		4-3	11	149		NA	
			(402011d-)				
7	30 Sep 10	4-2	47	145	142	94.3	93.7
		4-3	48	139		93.1	
350 µg/mL Standard			(402011a-)				
0	23 Sep 10	4-14	22	331	356	NA	
		4-15	23	381		NA	
			(402011d-)				
7	30 Sep 10	4-14	49	329	351	99.5	98.5
		4-15	50	372		97.6	
2.50 mg/mL Quality Control			(402011a-)	(mg/mL)	(mg/mL)		
0	23 Sep 10	8-3	30	2.72	2.65	NA	
		8-4	31	2.58		NA	
			(402011d-)				
7	30 Sep 10	8-3	51	2.50	2.49	92.0	93.9
		8-4	52	2.47		95.8	
125 mg/mL Quality Control			(402011a-)				
0	23 Sep 10	8-9	36	121	123	NA	
		8-10	37	125		NA	
			(402011d-)				
7	30 Sep 10	8-9	53	120	121	99.0	97.9
		8-10	54	121		96.7	

NA = Not Applicable

402011 results.xls 3PSS
Printed: 09Mar2011 1:34 PM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 3. Homogeneity/Concentration Assessment of the 22 September 2010 Formulations
(Analyzed 22 September 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011A)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
2/Mid	0	11 - 3	27			<---Not Quantifiable--->			
		11 - 4	28			<---Not Quantifiable--->			
3/Top	10	11 - 7	39	11.7	117	10.9	0.55	5.1	109
		11 - 8	40	10.1	101				
3/Mid		11 - 9	41	11.2	112				
		11 - 10	42	11.0	110				
3/Btm		11 - 11	43	10.5	105				
		11 - 12	44	10.6	106				
4/Top	30	11 - 13	45	37.2	124	35.6	3.9	11	119
		11 - 14	46	31.8	106				
4/Mid		11 - 15	47	38.3	128				
		11 - 16	48	38.1	127				
4/Btm		11 - 17	49	38.6	129				
		11 - 18	50	29.4	98.1				

402011 results.xls 1H
Printed: 09Mar2011 1:34 PM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 3 (Continued). Homogeneity/Concentration Assessment of the 22 September 2010 Formulations
(Analyzed 22 September 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011A)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
5/Top	90	11 - 19	51	106	118	116	6.4	5.5	129
		11 - 20	52	120	134				
5/Mid		11 - 21	53	122	136				
		11 - 22	54	116	129				
5/Btm		11 - 23	55	112	124				
		11 - 24	56	121	134				

402011 results.xls 1H
Printed: 09Mar2011 1:34 PM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 4. Homogeneity Assessment of the 22 September 2010 Formulations - Back-Up Samples
(Analyzed 24 September 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011b)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
4/Top	30	30 - 1	37	26.6	88.6	25.6	2.6	10	85.2
		30 - 2	38	20.5	68.5				
4/Mid		30 - 3	39	27.2	90.5				
		30 - 4	40	27.4	91.4				
4/Btm		30 - 5	41	26.5	88.3				
		30 - 6	42	25.1	83.8				
5/Top	90	30 - 7	43	64.7	71.9	77.3	6.8	8.8	85.9
		30 - 8	44	77.8	86.5				
5/Mid		30 - 9	45	84.4	93.8				
		30 - 10	46	81.7	90.8				
5/Btm		30 - 11	47	76.8	85.3				
		30 - 12	48	78.2	86.9				

402011 results.xls 1H (2)
Printed: 17Jan2011 10:43 AM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 5. 8-Day Resuspension Homogeneity Assessment of the 22 September 2010 Formulations
(Analyzed 30 September 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref #	Line# (402011e)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
3/Top	10	65 - 1	38	10.4	104	9.99	0.34	3.4	99.9
		65 - 2	39	10.1	101				
3/Btm		65 - 3	40	9.61	96.1				
		65 - 4	41	9.86	98.6				
4/Top	30	65 - 5	42	30.3	101	29.7	0.46	1.6	99.1
		65 - 6	43	29.2	97.2				
4/Btm		65 - 7	44	29.8	99.5				
		65 - 8	45	29.6	98.8				
5/Top	90	65 - 9	46	88.5	98.4	90.7	3.0	3.3	101
		65 - 10	47	88.7	98.5				
5/Btm		65 - 11	48	90.7	101				
		65 - 12	49	94.9	105				

402011 results.xls 4RH
Printed: 17Jan2011 10:43 AM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 6. Concentration Assessment of the 29 September 2010 Formulations
(Analyzed 29 September 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011d)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
2/Mid	0	54 - 1	27	----------Not Detected----------					
		54 - 2	28	----------Not Detected----------					
3/Mid	10	54 - 3	40	9.27	92.7	9.91	0.90	9.1	99.1
		54 - 4	41	10.5	105				
4/Mid	30	54 - 5	42	29.8	99.2	30.6	1.2	3.9	102
		54 - 6	43	31.4	105				
5/Mid	90	54 - 7	44	91.9	102	90.7	1.7	1.8	101
		54 - 8	45	89.6	99.5				

402011 results.xls 2C
Printed: 17Jan2011 10:43 AM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 7. Concentration Assessment of the 6 October 2010 Formulations
(Analyzed 6 October 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011f)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
2/Mid	0	88 - 1	35	----------Not Detected----------					
		88 - 2	36	----------Not Detected----------					
3/Mid	10	88 - 3	37	9.56	95.6	9.40	0.23	2.4	94.0
		88 - 4	38	9.24	92.4				
4/Mid	30	88 - 5	39	28.6	95.2	29.1	0.79	2.7	97.1
		88 - 6	40	29.7	99.0				
5/Mid	90	88 - 7	41	80.0	88.9	84.5	6.3	7.4	93.9
		88 - 8	42	88.9	98.8				

402011 results.xls 3C
Printed: 17Jan2011 10:43 AM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 8. Concentration Assessment of the 13 October 2010 Formulations
(Analyzed 13-15 October 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011g1)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
2/Mid	0	120 - 1	12	----------Not Detected----------					
		120 - 2	13	----------Not Detected----------					
3/Mid	10	120 - 3	14	9.25	92.5	9.18	0.094	1.0	91.8
		120 - 4	15	9.11	91.1				
4/Mid	30	120 - 5	16	28.5	95.0	28.5	0.070	0.24	95.1
		120 - 6	17	28.6	95.3				
5/Mid	90	120 - 7	18	86.2	95.7	85.3	1.2	1.4	94.8
		120 - 8	19	84.5	93.9				

402011 results.xls 4C
Printed: 17Jan2011 10:43 AM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 9. Concentration Assessment of the 20 October 2010 Formulations
(Analyzed 20 October 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011h)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
2/Mid	0	142 - 1	38	----------Not Detected----------					
		142 - 2	39	----------Not Detected----------					
3/Mid	10	142 - 3	40	10.4	104	10.5	0.24	2.3	105
		142 - 4	41	10.7	107				
4/Mid	30	142 - 5	42	33.3	111	33.3	0.065	0.19	111
		142 - 6	43	33.4	111				
5/Mid	90	142 - 7	44	92.3	103	93.2	1.2	1.3	104
		142 - 8	45	94.0	104				

402011 results.xls 5C
Printed: 17Jan2011 10:43 AM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 10. Concentration Assessment of the 27 October 2010 Formulations - Back-Up Samples
(Analyzed 29 October 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011i2)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
2/Mid	0	173 - 1	33	----------Not Detected----------					
		173 - 2	34	----------Not Detected----------					
3/Mid	10	173 - 3	35	10.9	109	10.8	0.096	0.88	108
		173 - 4	36	10.8	108				
4/Mid	30	173 - 5	37	30.3	101	30.1	0.34	1.1	100
		173 - 6	38	29.9	99.5				
5/Mid	90	173 - 7	39	103	115	101	3.5	3.5	112
		173 - 8	40	98.1	109				

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 11. Concentration Assessment of the 3 November 2010 Formulations

(Analyzed 3 November 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011j)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
2/Mid	0	195 - 1	13	----------Not Detected----------					
		195 - 2	14	----------Not Detected----------					
3/Mid	10	195 - 3	32	10.0	100	9.78	0.38	3.8	97.8
		195 - 4	33	9.52	95.2				
4/Mid	30	195 - 5	34	30.7	102	30.2	0.78	2.6	101
		195 - 6	35	29.6	98.7				
5/Mid	90	195 - 7	36	87.4	97.2	90.1	3.8	4.2	100
		195 - 8	37	92.8	103				

402011 results.xls 7C
Printed: 17Jan2011 10:43 AM

A COMBINED 28-DAY REPEATED
DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE
REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF
NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE
MICRONUCLEUS TEST IN RATS

Table 12. Concentration Assessment of the 10 November 2010 Formulations
(Analyzed 10 November 2010)

Group/ Strata	Dose Conc. (mg/mL)	Ref # (402011 -)	Line # (402011k)	Analyzed Conc. (mg/mL)	Percent of Target (%)	Mean Conc. (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)
4/Mid	30	206 - 5	29	30.7	102	29.3	2.0	7.0	97.6
		206 - 6	30	27.8	92.8				
5/Mid	90	206 - 7	31	72.3	80.4	76.5	5.9	7.7	85.0
		206 - 8	32	80.6	89.6				

ATTACHMENT I

Certificate of Analysis

Certificate of Analysis

SIGMA-ALDRICH

Product Name	Fluorene-9-carboxylic acid, 97%
Product Number	F1409
Product Brand	ALDRICH
CAS Number	1989-33-9
Molecular Formula	$C_{14}H_{10}O_2$
Molecular Weight	210.23

TEST	SPECIFICATION	LOT 03706KH RESULTS
APPEARANCE	WHITE TO TAN POWDER, CRYSTALS, CRYSTALLINE	LIGHT YELLOW POWDER
INFRARED SPECTRUM		CONFORMS TO STRUCTURE.
TITRATION	96.5%-103.5% (WITH NAOH)	98.7% (WITH NAOH)
HIGH PRESSURE LIQUID CHROMATOGRAPHY	96.5% (MINIMUM)	99.9%
QUALITY CONTROL ACCEPTANCE DATE		AUGUST 2007

Barbara Rajzer, Supervisor
Quality Control
Milwaukee, Wisconsin USA

APPENDIX E

Animal Room Environmental Conditions

STUDY SPECIFICATIONS: 402011 DATE IN 09/07/10 TIME IN 09:00
DATE OUT 11/15/10 TIME OUT 08:00

ROOM SPECIFICATIONS: B ROOM 25 LOW TEMPERATURE °F: 66.0 HIGH TEMPERATURE °F: 76.0 LOW HUMIDITY %RH: 30.0
TEST SYSTEM: RAT LOW TEMPERATURE °C: 18.9 HIGH TEMPERATURE °C: 24.4 HIGH HUMIDITY %RH: 70.0

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
DATE	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
09/07/10	70.8	21.6	70.1	21.2	52.5	52.9
09/08/10	70.8	21.6	70.4	21.3	47.1	48.3
09/09/10	70.9	21.6	70.6	21.4	44.4	45.4
09/10/10	70.9	21.6	70.7	21.5	47.8	48.9
09/11/10	70.8	21.6	70.7	21.5	48.4	48.9
09/12/10	71.0	21.7	70.8	21.6	49.7	50.0
09/13/10	70.8	21.6	70.5	21.4	48.5	49.6
09/14/10	70.7	21.5	70.4	21.3	45.7	46.7
09/15/10	70.6	21.4	70.3	21.3	49.2	50.4
09/16/10	70.8	21.6	70.7	21.5	52.1	51.2
09/17/10	70.8	21.6	70.8	21.6	50.8	51.1
09/18/10	70.8	21.6	70.8	21.6	48.3	49.0
09/19/10	70.6	21.4	70.6	21.4	52.0	51.2
09/20/10	70.9	21.6	70.8	21.6	49.0	49.7
09/21/10	70.8	21.6	70.5	21.4	51.2	51.5
09/22/10	71.0	21.7	70.4	21.3	54.4	53.3
09/23/10	70.7	21.5	70.2	21.2	53.7	52.7
09/24/10	70.6	21.4	70.0	21.1	53.2	52.7
09/25/10	70.7	21.5	70.5	21.4	46.1	46.6

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
DATE	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
09/26/10	70.7	21.5	70.7	21.5	41.5	41.9
09/27/10	70.8	21.6	70.9	21.6	49.3	49.8
09/28/10	70.9	21.6	70.8	21.6	51.3	51.8
09/29/10	70.9	21.6	70.9	21.6	48.8	49.4
09/30/10	70.8	21.6	70.7	21.5	49.5	50.1
10/01/10	70.8	21.6	70.8	21.6	44.8	45.6
10/02/10	70.8	21.6	70.8	21.6	44.8	46.0
10/03/10	71.0	21.7	71.0	21.7	44.1	44.8
10/04/10	70.8	21.6	70.9	21.6	43.1	44.1
10/05/10	70.8	21.6	70.9	21.6	43.5	44.2
10/06/10	70.8	21.6	70.9	21.6	44.6	45.5
10/07/10	70.9	21.6	70.8	21.6	42.7	43.6
10/08/10	71.0	21.7	70.9	21.6	42.4	43.6
10/09/10	70.8	21.6	70.7	21.5	45.0	46.2
10/10/10	70.6	21.4	70.5	21.4	49.7	50.4
10/11/10	70.8	21.6	70.6	21.4	48.6	49.4
10/12/10	70.8	21.6	70.7	21.5	46.5	47.2
10/13/10	70.9	21.6	70.8	21.6	41.3	42.9
10/14/10	70.9	21.6	70.9	21.6	44.3	45.8
10/15/10	70.9	21.6	70.9	21.6	42.0	43.7
10/16/10	70.7	21.5	70.7	21.5	41.1	42.8
10/17/10	70.9	21.6	70.9	21.6	41.2	43.0
10/18/10	70.9	21.6	71.0	21.7	41.5	43.3

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
DATE	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
10/19/10	70.8	21.6	70.9	21.6	40.4	42.4
10/20/10	70.8	21.6	70.7	21.5	40.1	42.6
10/21/10	70.8	21.6	70.7	21.5	40.6	42.9
10/22/10	71.1	21.7	71.0	21.7	39.8	42.9
10/23/10	71.2	21.8	71.2	21.8	39.4	42.3
10/24/10	71.1	21.7	70.9	21.6	44.3	46.2
10/25/10	70.9	21.6	70.8	21.6	50.3	50.6
10/26/10	70.9	21.6	70.8	21.6	50.7	50.3
10/27/10	70.9	21.6	70.8	21.6	42.5	43.6
10/28/10	70.8	21.6	70.6	21.4	39.3	42.2
10/29/10	70.9	21.6	70.8	21.6	40.4	43.6
10/30/10	70.9	21.6	71.0	21.7	40.2	43.7
10/31/10	70.8	21.6	70.9	21.6	41.7	45.1
11/01/10	70.7	21.5	70.8	21.6	41.2	44.6
11/02/10	70.8	21.6	71.0	21.7	39.9	43.7
11/03/10	71.0	21.7	71.2	21.8	42.0	45.3
11/04/10	70.7	21.5	70.7	21.5	43.7	46.5
11/05/10	71.0	21.7	71.1	21.7	43.9	46.7
11/06/10	70.8	21.6	71.0	21.7	43.0	46.5
11/07/10	70.7	21.5	70.9	21.6	43.0	46.7
11/08/10	70.9	21.6	71.1	21.7	43.0	46.1
11/09/10	71.1	21.7	71.2	21.8	42.7	45.5
11/10/10	71.0	21.7	71.1	21.7	43.8	46.3

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
DATE	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
11/11/10	70.8	21.6	70.9	21.6	43.8	46.2
11/12/10	71.0	21.7	71.1	21.7	43.0	45.9
11/13/10	71.1	21.7	71.2	21.8	43.5	46.0
11/14/10	70.9	21.6	70.9	21.6	43.9	46.4
11/15/10	71.2	21.8	71.5	21.9	42.2	45.3

SUMMARY OF DAILY MEANS	MEAN	MIN	MAX
PRIMARY TEMP °F:	70.9	70.6	71.2
PRIMARY TEMP °C:	21.6	21.4	21.8
SECONDARY TEMP °F:	70.8	70.0	71.5
SECONDARY TEMP °C:	21.6	21.1	21.9
PRIMARY HUM %RH:	45.2	39.3	54.4
SECONDARY HUM %RH:	46.7	41.9	53.3
N DAYS	70		

B ROOM 25 SUMMARY OF HOURLY VALUES

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
MEAN	70.9 °F	21.6 °C	70.8 °F	21.6 °C	45.2 %RH	46.7 %RH
MIN	68.8 °F	20.4 °C	69.0 °F	20.6 °C	37.0 %RH	38.4 %RH
MAX	74.1 °F	23.4 °C	73.9 °F	23.3 °C	61.9 %RH	60.9 %RH
SD	1.00	0.56	0.95	0.53	4.52	3.84
SE	0.02	0.01	0.02	0.01	0.11	0.09
N SAMPLES	1650		1650		1650	1650
FIRST DAY	09/07/10					
LAST DAY	11/15/10					
N DAYS	70					

STUDY 402011 SUMMARY OF HOURLY VALUES

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
MEAN	70.9 °F	21.6 °C	70.8 °F	21.6 °C	45.2 %RH	46.7 %RH
MIN	68.8 °F	20.4 °C	69.0 °F	20.6 °C	37.0 %RH	38.4 %RH
MAX	74.1 °F	23.4 °C	73.9 °F	23.3 °C	61.9 %RH	60.9 %RH
SD	1.00	0.56	0.95	0.53	4.52	3.84
SE	0.02	0.01	0.02	0.01	0.11	0.09
N SAMPLES	1650		1650		1650	1650
FIRST DAY	09/07/10					
LAST DAY	11/15/10					
N DAYS	70					

APPENDIX F

FOB Scoring Criteria

Scoring Criteria for the Functional Observational Battery

Definition:

The Functional Observational Battery (FOB) is a procedure used to detect gross functional deficits in test animals.

Description:

The FOB consists of a series of tests. The tests are categorized into home cage, handling, open field, sensory, neuromuscular and physiological observations and are as follows:

1. Home Cage Observations

    a. Posture
    b. Convulsions
    c. Tremors
    d. Biting
    e. Palpebral (eyelid) closure
    f. Feces Consistency

2. Handling Observations

    a. Ease of removal from cage
    b. Ease of handling animal in hand
    c. Lacrimation
    d. Chromodacryorrhea
    e. Salivation
    f. Piloerection
    g. Fur appearance
    h. Palpebral closure
    i. Respiratory rate
    j. Respiratory character
    k. Red deposits
    l. Crusty deposits
    m. Mucous membranes/eye/skin color
    n. Eye prominence
    o. Muscle tone

3. Open Field Observations

   a. Time to first step (seconds)
   b. Rearing
   c. Mobility
   d. Backing
   e. Grooming
   f. Gait
   g. Convulsions
   h. Tremors
   i. Gait Score
   j. Arousal
   k. Bizarre/Stereotypic behavior
   l. Urination
   m. Defecation

4. Sensory Observations

   a. Approach response
   b. Touch response
   c. Startle response
   d. Tail pinch
   e. Olfactory orientation
   f. Pupil response
   g. Eyeblink response
   h. Forelimb extension
   i. Hindlimb extension
   j. Air righting reflex

5. Neuromuscular Observations

   a. Hindlimb extensor strength
   b. Grip strength-hind and forelimb
   c. Rotarod performance
   d. Hindlimb foot splay

6. Physiological Observations

   a. Catalepsy
   b. Body Temperature
   c. Body Weight

Procedure

The FOB was performed on those study days specified in the study protocol. Test animals were removed from their "home cage" and placed into a separate bank in replicate order if the animals are not normally housed in replicate order with blinded cage cards. Test animals were allowed a minimum of 15 minutes in this new caging prior to the start of the FOB. Test animals were removed from this caging one at a time on the designated day of testing, and unless specified by study protocol were taken through the FOB in the following order: FOB1 (inclusive of categories 1a-1f and 2a), FOB2 (inclusive of categories 2b-2o, 3a-3m and 4a-4J) and FOB3 (inclusive of categories 5a-5d and 6a-6c).

Testing was performed by technicians, who did not know the group assignment of the animals. A description of the scoring criteria for each test is provided below:

1. HOME CAGE OBSERVATIONS

Observations of the animal in its home cage and while opening the home cage were performed and scored as follows:

a. Posture

Sitting or standing normally	1
Asleep, lying on side or curled up	2
Alert, oriented toward observer	3
Sitting, head held low	4
Flattened, limbs may be extended	5
Lying on side, limbs in air	6
Immobile	7
Rearing	8

b. Convulsions

I. Clonic

Absent	1
Repetitive movement of mouth and jaws	2
Clonic tremors of the limbs (contraction followed by relaxation)	3
Whole body tremors	4
Clonic convulsions	5
Wet Dog Shakes	6
'Popcorn seizure': animal repeatedly jumps or bounces in air	7

II. Tonic

Absent	1
Tonic: contraction of extensors such that limbs are rigid and extended	2
Opisthotonus: head, body and limbs rigidly arched backwards	3
Emprosthotonus: head, body and limbs extended forward	4
Asphyxial: bouts of severe clonic-tonic convulsions	5

c. Tremors

None	1
Slight (1.5 mm)	2
Moderately coarse (3 mm), slight impairment of locomotion	3
Markedly coarse (4.5 mm), moderate/marked impairment of locomotion	4
Extremely coarse (6 mm), locomotion impossible	5

d. Biting

None	1
Biting of cage	2
Biting of self	3

e. Palpebral (eyelid) closure

Eyelids wide open	1
Eyelids slightly drooping	2
Drooping eyelids (half closed)	3
Eyelids completely shut	4

f. Feces Consistency

Pellets	1
Pellets, partially formed	2
Unformed, diarrhea	3
Pellets absent	4

2. HANDLING OBSERVATIONS

Animals were removed singly from their cages and observed and scored as follows:

a. Ease of removal from cage

Very easy: animal sits quietly, allows investigator to pick it up	1
Easy: with or without vocalization, without resistance or slight resistance to being picked up	2
Moderately difficult: animal rears, often following investigator's hand	3
Freezes: with or without vocalization	4
Difficult: runs around cage, is hard to grab, with or without vocalization	5
Very difficult: tail and throat rattles with or without vocalization, may attack hand	6

b. Ease of handling animal in hand

No resistance, animal is easy to handle	1
Slight resistance to being handled, with or without vocalization	2
May freeze, or be tense or rigid in hand, with or without vocalization	3
Twists, attempts to bite with or without vocalization	4

c. Lacrimation

None	1
Slight	2
Severe	3

d. Chromodacryorrhea

Absent	1
Present	2

e. Salivation

None	1
Slight	2
Severe	3

f. Piloerection

None	1
Slight	2
Severe	3

g. Fur Appearance

Normal: clean and groomed	1
Slightly soiled	2
Very soiled, crusty	3

h. Palpebral closure

Eyelids wide open	1
Eyelids slightly drooping	2
Drooping eyelids (half closed)	3
Eyelids completely shut	4

i. Respiratory Rate (counts per minute listed as a general reference; finding is based on qualitative assessment only)

Normal: by observation (80-110/min.)	1
Decreased: below 80/min.	2
Increased: above 110/min.	3

j. Respiratory Character

Normal	1
Rales: abnormal sound accompanying breathing	2
Retching	3
Dyspneic: short of breath	4
Gasping	5

k. Red Deposits - eyes, nose, mouth

Present	1
Absent	2

l. Crusty Deposits - eyes, nose, mouth

Present	1
Absent	2

m. Mucous membranes/eye/skin color

Pink	1
Pale	2
Darkened	3
Darkened, brown	4
Bright, deep red flush	5

n. Eye Prominence

Normal	1
Exophthalmus	2
Enophthalmus	3

o. Muscle Tone

The musculature of the limbs was palpated between the thumb and forefinger.

Muscle is firm but not hard (normal)	1
Muscle is soft and flabby	2
Muscle is tense and hard	3

3. OPEN FIELD OBSERVATIONS

Animals were placed singly in the open field arena (24" x 24" x 6"; constructed from Plexiglas® and black in color) and evaluated over a 2-minute observation period as follows:

a. Time to first step (seconds)

The time taken for the animal to take its first step in the open field arena was recorded to the hundredth (0.01) of a second. If the animal does not take an actual step in a direction, an entry of 120 seconds was recorded.

b. Rearing

The number of times the animal reared back onto its hind legs and stood up with both front paws raised off the surface was recorded over a 2-minute observation period in the open field arena.

c. Mobility (scored within 30 seconds of placing animal in the open field arena)

Normal	1
Slightly Impaired	2
Moderately Impaired	3
Totally Impaired, Locomotion impossible	4

d. Backing

The number of times the animal took three or more backward steps over a 2-minute observation period in the open field arena was recorded.

e. Grooming

The number of times the animal groomed itself over a 2-minute observation period in the open field arena was recorded. Grooming included washing the face and head with the forepaws, scratching the head or body with a hind paw, and biting the fur.

f. Gait

Normal, head horizontal, abdomen just above surface, slight up and down movement with each step	1
Walks on tiptoes	2
Body drags, abdomen makes contact with surface, body sway	3
Hindlimbs splayed or dragging, unable to support weight	4
Hunched body, bottom up, nose held down, arched back	5
Ataxia, excessive sway, rocks or lurches as animal proceeds forward	6
Walks on Metatarsus	7

g. Convulsions

I. Clonic

Absent	1
Repetitive movement of mouth and jaws	2
Clonic tremors of the limbs (contraction followed by relaxation)	3
Whole body tremors	4
Clonic convulsions	5
Wet Dog Shakes	6
'Popcorn seizure': animal repeatedly jumps or bounces in air	7

II. Tonic

Absent	1
Tonic: contraction of extensors such that limbs are rigid and extended	2
Opisthotonus: head, body and limbs rigidly arched backwards	3
Emprosthotonus: head, body and limbs arched forward	4
Asphyxial: bouts of severe clonic-tonic convulsions	5

h. Tremors

None	1
Slight (1.5 mm)	2
Moderately coarse (3 mm), slight impairment of locomotion	3
Markedly coarse (4.5 mm), moderate/marked impairment of locomotion	4
Extremely coarse (6 mm), locomotion impossible	5

i. Gait Score: Ability to locomote despite abnormalities in gait

Normal	1
Slight impairment, but definite	2
Considerable impairment, without falling	3
Marked impairment, falls every 4 to 6 steps	4
Severe impairment, cannot walk without falling	5

j. Arousal

Very low: Stupor, coma, little or no responsiveness	1
Low: Somewhat stuporous	2
Normal: Alert, exploratory movements	3
Somewhat high: Slight excitement, tense, excited sudden darting or freezing	4
Very high: Hyperalert, excited, sudden bouts of running or body movements	5

k. Bizarre/Stereotypic Behavior

None	1
Head Flick: head shaking or backward flip of head	2
Head Search: stereotyped, repetitive turning of head from side to side as though searching the environment	3
Hallucinatory: animal appears to be responding to objects not present	4
Compulsive licking or biting	5
Prancing: restless shifting from one forelimb to other, with slight turning of the body from side to side	6
Upright walking: on hindlimbs only	7
Aimless wandering: progressive, slow, plodding movements about environment, with no apparent purpose	8
Circling: tendency to move in circles around and along objects, or in an open environment	9
Waltzing: rapid turning in circles	10
Retropulsion: where animal walks backwards	11
Spatial disorientation: walking or stumbling into objects	12
Side to side rocking	13
Straub tail: increased tail elevation	14
Vertical Jumping	15
Pacing without purpose	16
Head bobbing	17
Writhing: lying down, wavelike movement of abdomen, alternating limb movements	18

l. Urination

The number of pools of urine in the open field arena was counted.

m. Defecation

The number of fecal boluses in the open field arena was counted.

4. SENSORY OBSERVATIONS

Sensory tests were performed in the open field arena as follows:

a. Approach Response

The animal was approached head-on with a blunt object held approximately 3 cm from its face for a 4-second period.

No reaction	1
Slow approach, sniffing or turning away	2
More energetic than (2) may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reaction: jumps, bites or attacks	5

b. Touch Response

The rump of the animal was approached from the side and touched with a blunt object.

No reaction	1
Animal may slowly turn, walk away	2
More energetic response than (2), may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reaction: jumps, bites or attacks	5

c. Startle Response

A clicker held approximately 5 cm above the head of the animal was used to make a sudden sound.

No reaction	1
Slight reaction, ear flick or some evidence that snap was heard	2
More energetic response than (2), may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reactions: jumps, attacks, bites	5

d. Tail Pinch

Metal tweezers were used to squeeze tail approximately 2-3 cm from tip.

No reaction	1
Animal may turn or walk away	2
More energetic than (2), may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reaction: jumps, attacks or bites	5

e. Olfactory Orientation

Approaching the animal from behind, a cotton swab that had been dipped into a jar of commercially available homogenized baby food was brought to within approximately 4-5 cm of the side of the animal's head.

No reaction present	1
Reaction present, animal approaches swab making sniffing movements with nose, may lick swab	2

f. Pupil Response

The beam from a pen light was brought to within approximately 5 mm of the surface of the eye. Changes in pupil size were recorded.

No pupil response	1
Pupil response present	2

g. Eyeblink Response

The corner of the eye was touched gently with a blunt object.

No eyeblink response	1
Eyeblink response present	2

h. Forelimb Extension

The animal was held by the tail and lowered towards a table top. The presence or absence of normal forelimb extension was recorded.

No forelimb extension	1
Forelimb extension present	2

i. Hindlimb Extension

The animal was placed on a table top and lifted by the tail. The presence of normal hindlimb extension was recorded.

No hindlimb extension	1
Hindlimb extension present	2

j. Air Righting Reflex

The animal was held in a supine position and dropped from a height of approximately 30 cm. The ease of landing was scored as follows:

Normal	1
Slightly uncoordinated	2
Lands on side	3
Lands on back	4

5. NEUROMUSCULAR OBSERVATIONS

a. Hindlimb Extensor Strength

The animal was picked up and slight pressure was applied to its hindlimbs. The normal response is for the animal to extend its hindlimbs against the pressure.

Hindlimb resistance absent	1
Reduced hindlimb resistance, animal shows some weakness	2
Hindlimb resistance present	3

b. Grip Strength - hind and forelimb

Forelimb and hindlimb grip strength were measured using a device similar to the one described by Meyer *et al* (Neurobehav. Toxicol. 1:233-239, 1979). The animal was allowed to grip a T-shaped grip bar with its forepaws and was pulled back gently along a platform until its grip was broken. As the backward locomotion continued, the animal's hindpaws reached a T-shaped rearlimb grip bar, which it was allowed to grasp and then forced to release by continued pulling. Mark-10 series EG digital force gauge (Mark-10 Corporation, Copiague, NY) was used to record the maximum strain required to break forelimb and hindlimb grip. The average of three valid measurements was taken as the animal's score for each grip strength measure. Grip strength measurements were recorded as grams (g).

c. Rotarod Performance

During the pretest period, the animals were trained to walk on a rotarod (a 7.0-cm-diameter rod rotating at 12 rpm; AccuScan Instruments, Inc., Columbus, Ohio) for a period of two minutes. The duration of time each animal remained on the rotarod (up to a maximum time of 120 seconds) during testing was recorded.

d. Hindlimb Foot Splay

The heel pads of the hindfeet of the animal were painted with a non-toxic water-based paint. Animals were dropped from a horizontal position approximately 30 cm above a table onto the Hindlimb Foot Splay Test sheet for a total of 3 trials. The distance (to the nearest millimeter) between the inner edge of the ink blots made by each foot was measured for the latter 2 trials and the average score (to the nearest millimeter) was calculated.

6. PHYSIOLOGICAL OBSERVATIONS

a. Catalepsy

The animal was placed on four Plexiglas® platforms (35 mm high and 40 mm in diameter) that were a distance of 100 mm from each other between the fore and hind feet and 60 mm between right and left feet (when measured from the center of the platforms). The time each animal remained on the four platforms was recorded. The duration of immobility was measured (up to a maximum time of 60 seconds). Times are recorded to the hundredth (0.01) of a second.

b. Body Temperature

A thermometer was inserted into the rectum of the animal, and the body temperature was recorded after an equilibration period of approximately 30 seconds. Temperatures were recorded to the tenth (0.1) of a degree.

c. Body Weight

The weight of the animal was recorded.

The Functional Observational Battery is normally recorded on-line via the WTDMS™ "IFOB" program in NT-module. In the event that the Data Management System is unavailable for on-line data collection, data are hand-recorded on the Functional Observational Battery Individual Data Sheets (T1-228, as revised). When appropriate, the hand-recorded data are late entered into the Data Management System.

APPENDIX G

Neurobehavioral Validation and Positive Control Data [Crl:CD(SD) Rats]

STUDY TITLE

A POSITIVE CONTROL VALIDATION STUDY
OF LOCOMOTOR ACTIVITY IN RATS

STUDY NUMBER

WIL-99435

STUDY DIRECTOR

[redacted]

STUDY INITIATION DATE

1 October 2007

STUDY COMPLETION DATE

3 June 2008

PERFORMING LABORATORY

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-8946

STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS

The purpose of the study was to validate the use of the Kinder Scientific MotorMonitor System in our laboratory and to demonstrate the ability to detect decreases in locomotor activity using this system. Therefore, this page has been intentionally left blank.

1. ABSTRACT

The objective of this study was to demonstrate the ability of the Kinder Scientific MotorMonitor System (Kinder Scientific, LLC, Poway, CA, USA) to detect decreases in activity in response to haloperidol within the U.S. EPA OPPTS Guideline 870.6300 (Developmental Neurotoxicity) and the International Conference on Harmonization (ICH) Guideline 4.1.2 (Pre- and Postnatal Development, Including Maternal Function). Haloperidol was administered at dosage levels of 0.05, 0.1, and 0.5 mg/kg by a single intraperitoneal injection 30 minutes prior to behavioral testing on postnatal day (PND) 13, 17, 21 or 61. Male and female Sprague-Dawley Crl:CD (SD) rats were used for assessment of locomotor behavior with the Kinder Scientific Motor Monitor System. Overall, haloperidol caused a dose-dependent decrease in locomotor activity (total activity counts and ambulatory counts) for both male and female rats at PND 13, 17, 21 and 61. Habituation was noted in PND 17, 21, and 61, but not in PND 13, males and females. The experimental design used in this study demonstrated that WIL Research Laboratories, LLC can detect locomotor effects of haloperidol using the Kinder Scientific Motor Monitor System, and that the results can be considered to validate methodologies for OPPTS Guideline 870.6300 developmental neurotoxicity studies and ICH Guideline 4.1.2 pre- and postnatal development studies.

2. INTRODUCTION

The U.S. EPA guidelines (OPPTS 870.6300) for developmental neurotoxicity studies indicate that locomotor activity testing should be performed on postnatal day (PND) 13, 17, 21 and 60 (± 2 days). Both the OPPTS 870.6300 and ICH 4.1.2 guidelines require that neurobehavioral endpoints such as motor behavior be included with standard toxicological indices. Validation of laboratory methodologies and demonstration of the sensitivity of the equipment to detect test article-related changes are requirements of these guidelines. WIL Research Laboratories, LLC chose to evaluate the use of the Kinder Scientific MotorMonitor System to measure locomotor behavior in control and test article-treated animals using haloperidol, which is a potent neuroleptic known to decrease locomotor behavior.In rodent models used in behavioral assessment of motor behavior, haloperidol impairs motor activity, decreases startle responsiveness and often induces catalepsy (Fowler and Senvus, 1993; Patacchioli et al., 1996; Swerdlow et al., 1998; Tada et al., 2004; Ballard et al., 2007). Specifically, at 0.1 mg/kg (s.c.), haloperidol was able to decrease the startle magnitude in rats following acoustic stimulation (Swerdlow et al. 1998). Regarding generalized motor behavior during open field assessments, haloperidol at 0.05 mg/kg (i.p.) decreased activity counts, distance traveled, and overall velocity (van den Buuse, 2003). For physically demanding performance tasks, haloperidol at 0.16 and 0.32 mg/kg decreased the overall locomotor speed of the rat during testing, while a dose as low as 0.04 mg/kg caused impaired task performance (Fowler and Senyuz, 1993). Further behavioral measurements by Patacchioli et al. (1996) showed that haloperidol at 0.5 mg/kg (i.p.) when given to stimulated rats increased catalepsy time, while decreasing ambulations, rears, locomotor starts, and overall activity. These findings were supported in methamphetamine-stimulated rats where haloperidol induced catalepsy and decreased locomotion at dosages ranging from 0.032 to 0.32 mg/kg (Tada et al., 2004).

3. MATERIALS AND METHODS

3.1. TEST SPECIES AND HUSBANDRY

Sprague-Dawley Crl:CD(SD) rats were obtained from Charles River Laboratories, Inc. (Raleigh, NC, USA). Twenty females with litters (5 pups/sex) were ordered to provide 20 rats/sex/group for testing on PND 13, 17 and 21. The breeder females were individually housed in plastic maternity cages with nesting material (Bed-O'Cobs®). The dams and pups remained in these cages until euthanasia on lactation day/PND 21. For the PND 61 group, 80 rats/sex for motor assessment. The animals were housed 2-3/cage (by sex) for 1 week, then individually in suspended wire mesh cages until euthanasia.

Environmental controls were set to maintain temperature at 71 ± 5º F and relative humidity between 30–70%. Air handling units provided a minimum of 10 fresh air changes per hour. Fluorescent lighting, controlled by timers, provided illumination for a 12-hour (6:00 a.m. – 6:00 p.m.) light/dark photoperiod. Temperature and relative humidity were monitored continuously. Reverse osmosis-purified water and PMI Nutrition International, LLC Certified Rodent LabDiet® 5002 were offered *ad libitum* during the course of the study.

3.2. TEST MATERIAL AND PREPARATION

Haloperidol was purchased from Sigma Aldrich, Inc., St.Louis, MO, USA. An appropriate amount of haloperidol was mixed with the vehicle (1% lactic acid) to produce dosing levels of 0.05, 0.1 and 0.5 mg/kg of body weight with a corresponding dosage volume of 10 mL/kg (for PND 13, 17 and 21 neonates) and 1 mL/kg (for PND 61 young adults) Dosing solutions, including the vehicle for administration to the control group, were prepared on each day of dose administration.

3.3. EXPERIMENTAL DESIGN

For the neonatal phase, four groups of 20 rats/sex received an intraperitoneal injection of 0, 0.05, 0.1 or 0.5 mg/kg haloperidol on PND 13, 17 and 21. For the young adult phase, the same dosages of haloperidol were administered to four groups of 20 rats/sex on PND 61. At all four ages, the haloperidol was administered 30 minutes prior to assessment of locomotor behavior. All rats were observed twice daily for moribundity and mortality, once in the morning and once in the afternoon until euthanasia. Body

weight and clinical observations were recorded on each day of dose administration. The observations included, but were not limited to, evaluations for changes in appearance of skin and fur, eyes, mucous membranes, respiratory and circulatory systems, autonomic and central nervous systems, somatomotor activity and behavior. Additional observations, if needed, were documented in the study records. The following table summarizes the testing paradigm:

Neonatal Phase (Postnatal Day 13, 17 and 21)

Group Number	Test Article	Dosage Level (mg/kg)	Number of Males[a]	Number of Females[a]
1	Vehicle Control	0	20	20
2	Haloperidol	0.05	20	20
3	Haloperidol	0.1	20	20
4	Haloperidol	0.5	20	20

a - Animals used for neonatal phase assessments were selected from 20 litters for PND 13, 17 and 21 testing, such that 1 rat/sex/litter was assigned to each group.

Young Adult Phase (Postnatal Day 61)

Group Number	Test Article	Dosage Level (mg/kg)	Number of Males	Number of Females
1	Vehicle Control	0	20	20
2	Haloperidol	0.05	20	20
3	Haloperidol	0.1	20	20
4	Haloperidol	0.5	20	20

3.4. BEHAVIORAL TESTING

Twenty neonatal animals/sex/group were assigned to the locomotor activity tests performed on PND 13, 17, 21, and 20 young adult animals/sex/group were assigned to the locomotor activity test performed on PND 61 using the automated Kinder Scientific MotorMonitor System (Kinder Scientific, LLC, Poway, CA, USA). The test session was in a sound-attenuated room and was 60 minutes in duration, consisting of 6 subintervals lasting 10 minutes each. Locomotor activity was evaluated as total and ambulatory activity counts obtained over each subinterval (0-10 minutes, 11-20 minutes, 21-30 minutes, 31-40 minutes, 41-50 minutes and 51-60 minutes) and the entire 60-minute session.

3.5. STATISTICAL ANALYSIS

All analyses were two-tailed for minimum significance levels of 5% and 1%. All statistical tests were performed by a computer with appropriate programming as referenced below. Total and ambulatory locomotor activity counts were analyzed, by sex and session, with a repeated measure analysis of variance (RANOVA). Factors in the model included treatment group (TRT), time interval (TIME), and the interaction of time interval and treatment group (TRT*TIME). The SAS® procedure PROC MIXED was used for analysis with the random effect of animal included as the repeated measurement. The covariance structure across time was selected by comparing Akaike's Information Criterion.

The monotonic dose-response relationship was evaluated using sequential linear trend tests based on ordinal spacing of dose levels. The linear dose by time interaction was evaluated and, if significant at the 0.05 level, trend tests on treatment means were performed at the 0.05 level for each time interval. If the linear dose by time interaction was not significant, the trend test was conducted across the pooled time intervals of the entire session only.

Nonmonotonic dose responses were evaluated whenever no significant linear trends were detected but TRT and/or TRT*TIME interaction was significant at the 0.01 level. Within the framework of the RANOVA, pairwise comparisons were made for each individual test article-treated group with the control group through linear contrasts. If TRT*TIME was significant, the comparisons were conducted for each time interval. If only the TRT effect was significant, the comparisons were conducted across the pooled time intervals of the entire session. These nonmonotonic dose-response comparisons were conducted at the 0.01 significance level.

All statistical analyses were conducted by BioSTAT Consultants, Inc., Portage, MI, USA, using SAS Version 8.2 (SAS Institute, Inc., 1999-2001) software.

4. RESULTS AND DISCUSSION

A normal ontogenic profile of activity in control animals was demonstrated by the Kinder Scientific MotorMonitor System when examining both the mean total and mean ambulatory activity counts from PND 13, 17, and 21 males (Figures 1A and 2A). This trend, however, was not present in females (Figures 1B and 2B) because of the elevated level of activity in the PND 13 control females. Specifically, the PND 13 vehicle control males tended to be less active than the PND 17 males in the same group, with activity decreasing on PND 21. This is consistent with the development of motor behavior in a novel environment, where activity is relatively low in PND 13 neonatal rats, increases around PND 17 and then decreases around PND 21. Total activity counts measured in each subinterval by the Kinder Scientific MotorMonitor in PND 13 haloperidol treatment groups (Figure 3A and B) shows a decreased motor activity for males (0.5 mg/kg) and females (0.05, 0.1, and 0.5 mg/kg). This same haloperidol effect was also present in ambulatory activity counts over the subintervals (Figure 4A and B), where ambulatory activity was decreased in males (0.5 mg/kg) and females (0.05, 0.1, and 0.5 mg/kg). When examining the mean total and ambulatory activity taken over all subintervals (Figure 1A and B, Figure 2A and B), there was also an indication that the PND 13 females showed a dose-dependent decrease in activity for each haloperidol treatment, whereas PND 13 males only showed decreased motor activity at 0.5 mg/kg. In the PND 13 males, the lower haloperidol doses (0.05 and 0.1 mg/kg) did not consistently decrease motor activity. Although the decreased motor activity following haloperidol treatment was attenuated in males, the decreased total and ambulatory activity counts are consistent with previously published studies indicating that haloperidol decreases overall motor activity (Fowler and Senyuz, 1993; Patacchioli et al., 1996; Swerdlow et al., 1998; Tada et al., 2004; Ballard et al., 2007).

The total activity counts across individual subintervals measured in PND 17 males and females (Figure 5A and B) showed a more robust dose-dependent decrease than in the PND 13 haloperidol treatment groups (0.05, 0.1, and 0.5 mg/kg). In a similar manner, the PND 17 male and female (Figure 6A and B) ambulatory activity counts followed the same dose-dependent trend following haloperidol treatment at 0.05, 0.1, and 0.5 mg/kg. For both total and ambulatory activity, the presence of a dose-dependent decrease in the

PND 17 males was partially the result of the relatively large increase (approximately 3-fold) in the baseline (vehicle control) activity compared to the vehicle control group on PND 13. In addition, there was the presence of habituation over the course of the behavioral assessment in the vehicle control males and females on PND 17. When examining the mean total and ambulatory activity taken over all subintervals (Figure 1A and B, Figure 2A and B), there was also an indication that the PND 17 males and females showed the same dose-dependent decrease in activity with haloperidol treatment. This is consistent with the effects of various doses of haloperidol (0.03 mg/kg to 0.5 mg/kg) decreasing overall and ambulatory activity, while increasing catalepsy in male and female rats (Fowler and Senyuz, 1993; Patacchioli et al., 1996; Swerdlow et al., 1998; Tada et al., 2004; Ballard et al., 2007).

This effect of haloperidol decreasing total activity counts over the six subintervals was also present in the PND 21 male and female 0.1 and 0.5 mg/kg treatment groups (Figure 7A and B). Ambulatory activity taken over the six subintervals also decreased in a dose-dependent manner for both males and females (Figure 8A and B). In the PND 21 males and females, habituation to the environment was present in controls, as well as in the 0.01, 0.1, 0.5 mg/kg haloperidol treatment groups, although the habituation profile was difficult to evaluate for males and females in the 0.5 mg/kg group. The decreased motor behavior (total and ambulatory activity counts) was similar to the overall trend noted in PND 17 males and females, as well as the effect of haloperidol decreasing motor activity indicated in the literature. This is also consistent with the effects of various doses of haloperidol (0.03 mg/kg to 0.5 mg/kg) decreasing overall and ambulatory activity, while increasing catalepsy in male and female rats (Fowler and Senyuz, 1993; Patacchioli et al., 1996; Swerdlow et al., 1998; Tada et al., 2004; Ballard et al., 2007).

In general for the PND 13 males and females, habituation did not occur over the course of assessment for both total and ambulatory activity (Figure 3A and B, Figure 4A and B). There was also an apparent gender effect in both total and ambulatory activity counts taken over the individual subinterval or over the entire assessment period suggesting that females are more sensitive to haloperidol treatment than males. This apparently attenuated effect, however, is likely due to elevated baseline (vehicle control) activity

measurements in females compared to males at PND 13. As previously noted, the PND 13 rats did not have an habituation profile, whereas this profile became present in the PND 17 and 21 rats (Figures 5 through 8). This indicates that the Kinder Scientific MotorMonitor System was able to detect the development of activity for PND 13, 17 and 21 males and females.

Haloperidol treatment of male and female PND 61 young adults (Figure 10A and B) identified a decrease in total activity over the course of the six subintervals only at the two higher doses (0.1 and 0.5 mg/kg). This same dose effect of 0.1 and 0.5 mg/kg haloperidol was also present in the ambulatory activity data over all subintervals (Figure 11A and B). Although habituation was present in the control and haloperidol treatments (0.05, 0.1, and 0.5 mg/kg), the 0.5 mg/kg profile was attenuated. Since trend of habituation was specific within all PND 61 rats, this was likely indicative of a decreased sensitivity in the young adult rats (or increased sensitivity in younger rats). This was also apparent in the mean total and ambulatory activity counts for the entire testing session (Figure 9A and B) where only the 0.1 mg/kg and 0.5 mg/kg doses substantially decreased activity. However, haloperidol still decreased motor activity (total and ambulatory activity counts) in both males and females, which is consistent with the previously examined ages in this study and with the published literature (Fowler and Senyuz, 1993; Patacchioli et al., 1996; Swerdlow et al., 1998; Tada et al., 2004; Ballard et al., 2007).

In conclusion, the motor activity data (i.e. total activity and ambulatory activity) for Sprague Dawley Crl:CD (SD) rats generated by the Kinder Scientific MotorMonitor System are consistent with the effects of haloperidol on motor behavior. This motor monitoring system is therefore capable and sensitive enough to measure reductions in motor activity in neonatal and young adult rodents with a positive control agent such as haloperidol.

5. REFERENCES

Ballard, M.E.; Basso A.M.; Gallagher, K.B.; Brownman, K.E.; Fox G.B.; Drescher, K.U.; Gross, G.; Decker, M.W.; Rueter, L.E.; Zhang, M. The drug-induced helplessness test: an animal assay for assessing behavioral despair in response to neuroleptic treatment. Psychopharmacology **2007**, *190*, 1-11.

Fowler, S.C.; Senyuz, L. Effects of haloperidol on a run-climb-run behavioral task: distance climbed does not alter within-session decrements. *Behavioral Neuroscience* **1993**, *107*, 651-661.

Patacchioli, F.R.; Di Grezia, R.; Angelucci, L. Arginine-aspartate and haloperidol-induced neurobehavioral effects in the rat. *European Journal of Pharmacology* **1996**, *299*, 29-32.

SAS® Proprietary Software, Version 8.2; SAS Institute, Inc.: Cary, NC, **1999-2001**.

Swerdlow, N.R.; Bakshi, V.; Waikar, M.; Taaid, N.; Geyer, M.A. Seroquel, clozapine and chlorpromazine restore sensorimotor gating in ketamine-treated rats. *Psychopharmacology*, **1998** *140*, 75-80.

Tada, M.; Shirakawa, K.; Matsuoka, N.; Mutoh, S. Combined treatment of quetiapine with haloperidol in animal models of antipsychotic effect and extrapyramidal side effects: comparison with risperidone and chlorpromazine. *Psychopharmacology* **2004**, *176*, 94-100.

van den Buuse, M. Acute effects of antipsychotic drugs on cardiovascular responses to stress. *European Journal of Pharmacology* **2003** *464*, 55-62.

6. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Report Submitted By:

[redacted]

Assistant Director, Neurosciences
Study Director

3 June 2008
Date

Report Prepared By:

[redacted]

Staff Toxicologist, Neurosciences

3 Jun 2008
Date

Report Reviewed By:

[redacted]

Group Supervisor, Neurosciences

3 June 2008
Date

[redacted]

Project Specialist, Neurosciences

3 Jun 2008
Date

[redacted]

Associate Director, Developmental and
Reproductive Toxicology

3 June 2008
Date

FIGURES 1 - 11

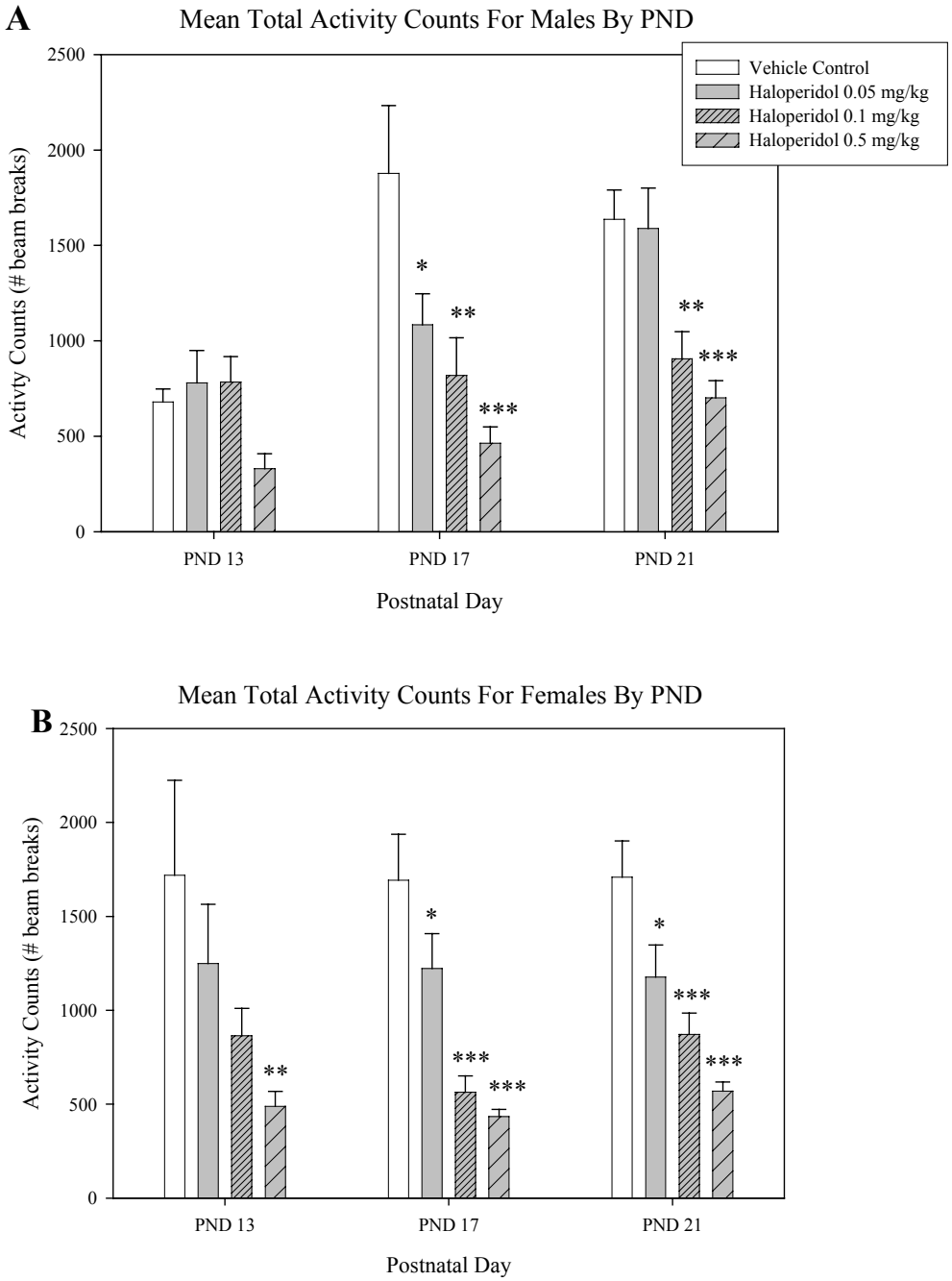


Figure 1: Mean total activity counts for (A) male and (B) female PND 13, 17 and 21 neonates, expressed as mean ± SEM. Significance between the treatment and vehicle control group is indicated by $^{*}p<0.05$, $^{**}p<0.01$ and $^{***}p<0.001$.

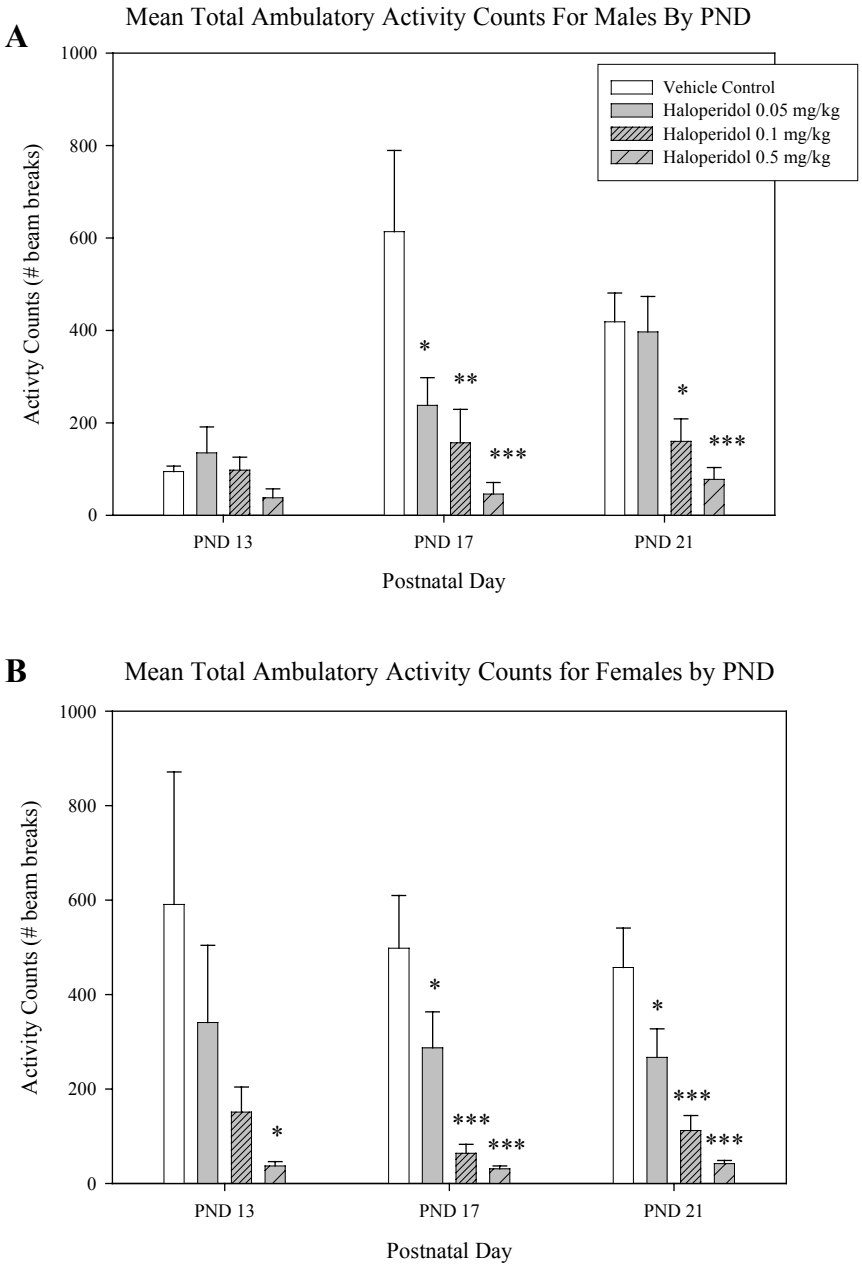


Figure 2: Mean total ambulatory activity counts (A) male and (B) female PND 13, 17 and 21 neonates, expressed as mean ± SEM. Significance between the treatment and vehicle control group is indicated by *p<0.05, **p<0.01 and ***p<0.001.

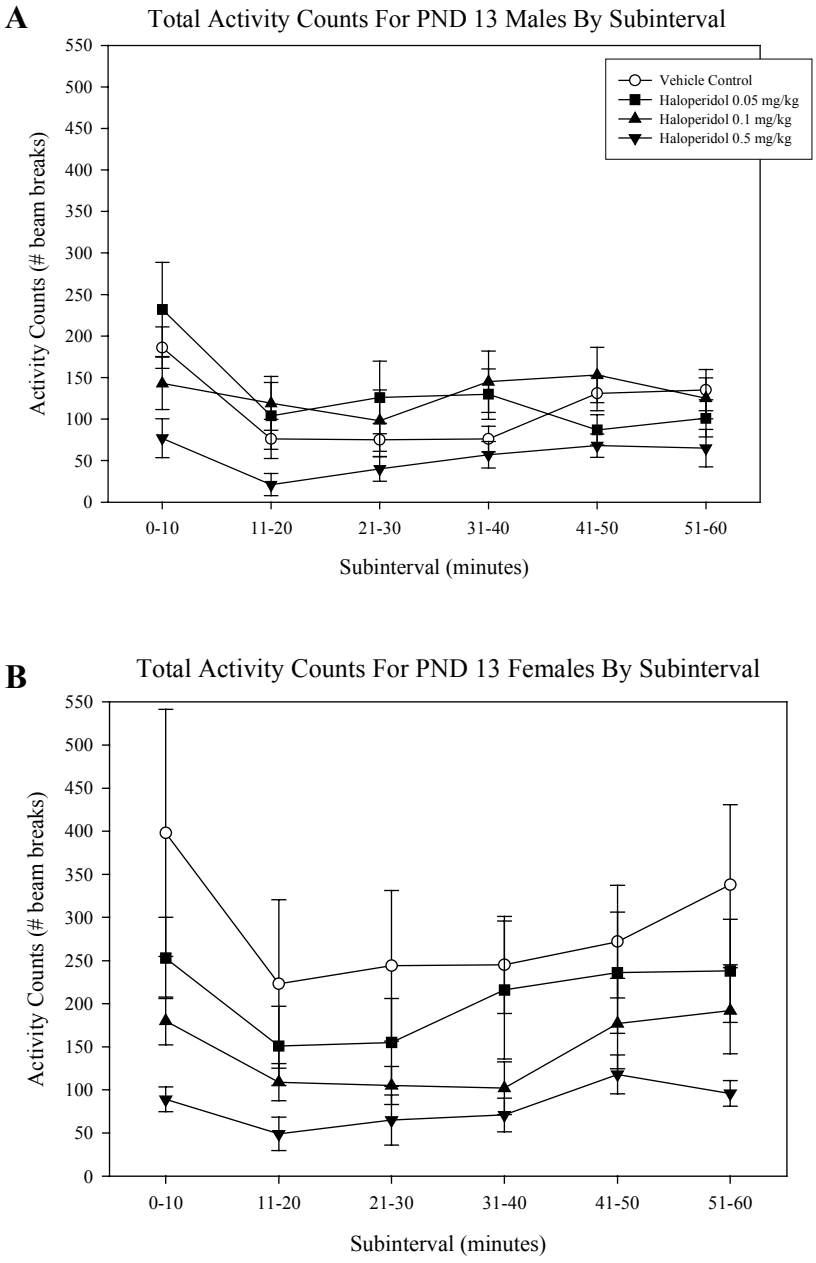


Figure 3: Mean total activity counts for (A) male and (B) female PND 13 neonates over each subinterval, expressed as mean ± SEM.

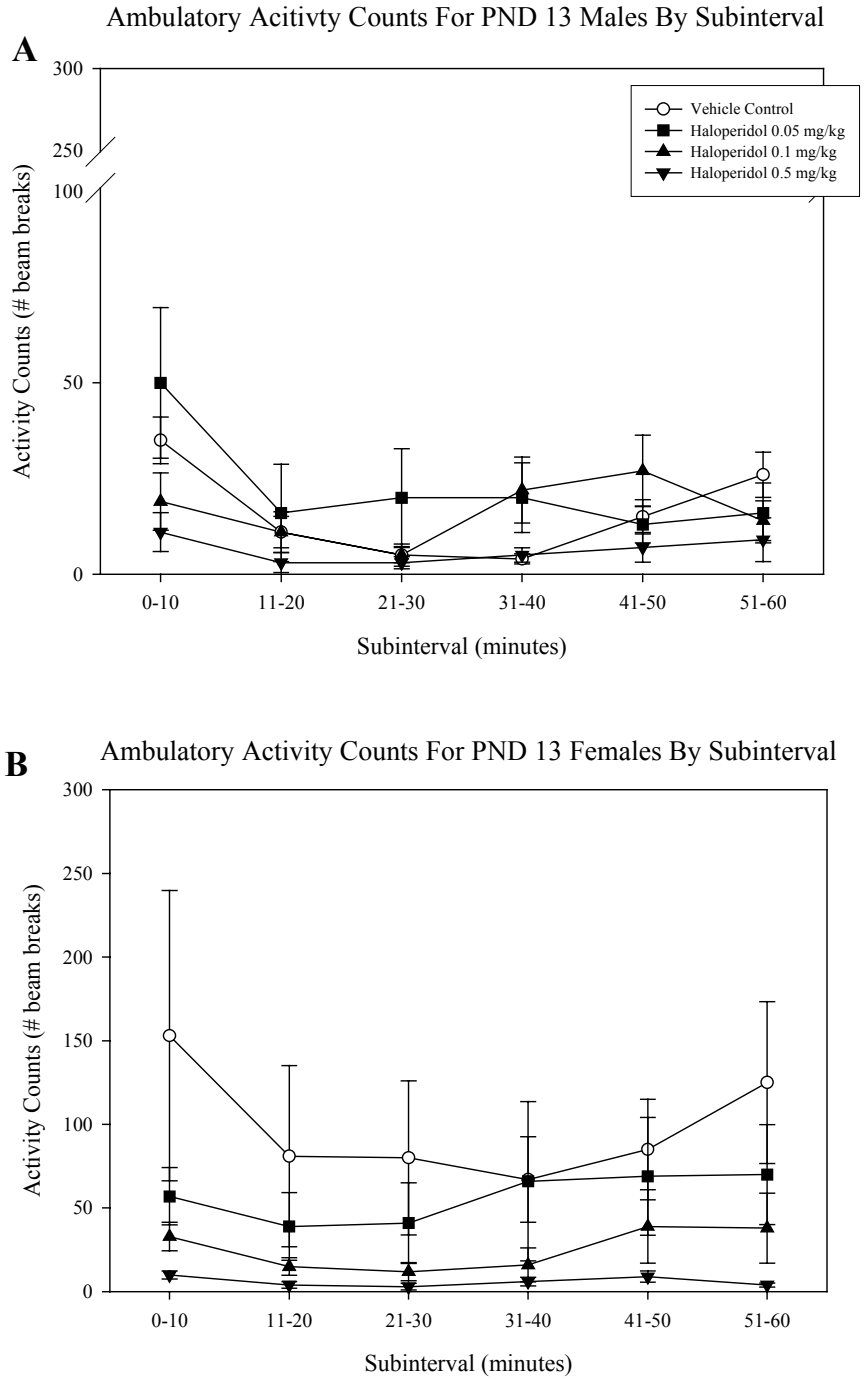


Figure 4: Mean ambulatory activity counts for (A) male and (B) female PND 13 neonates over each subinterval, expressed as mean ± SEM.

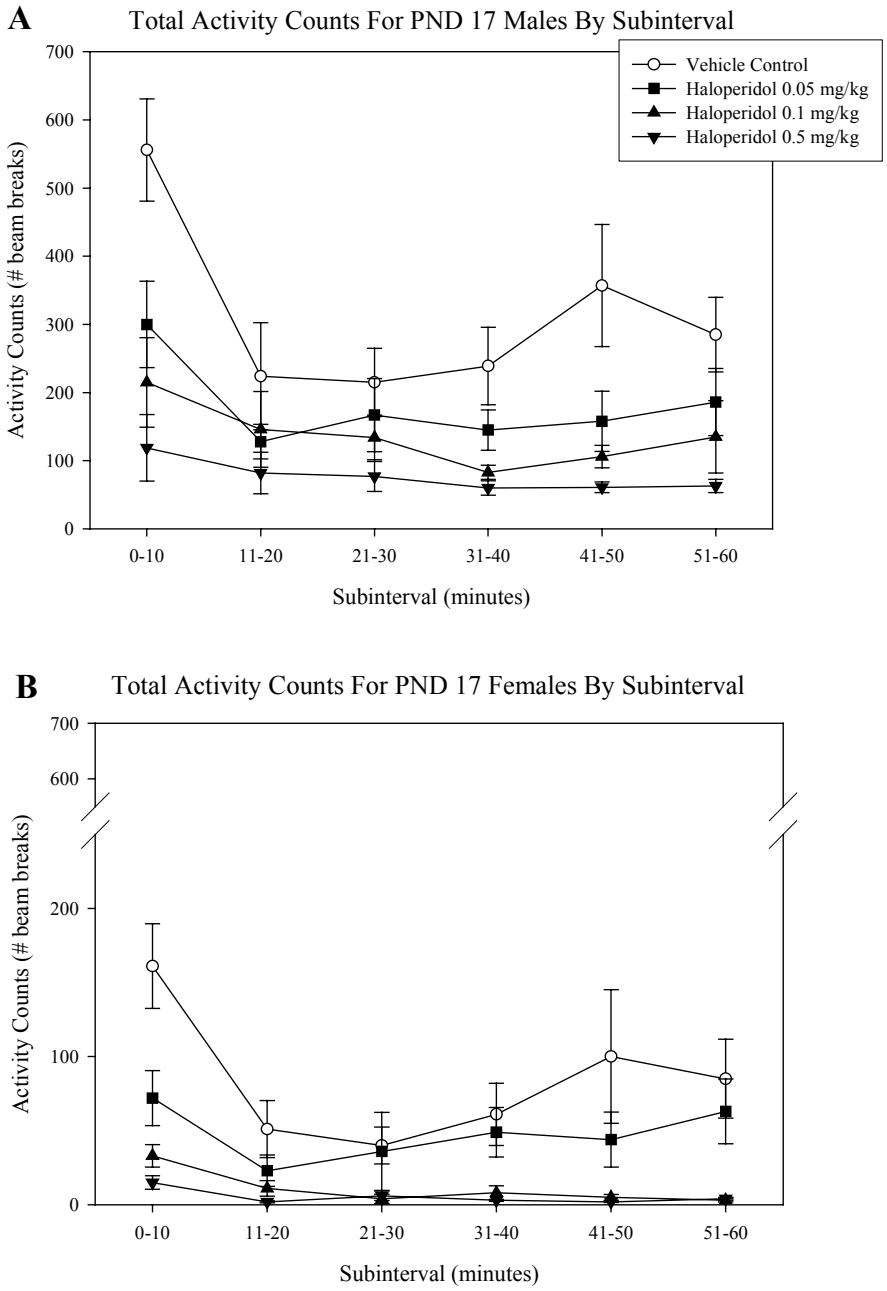


Figure 5: Mean total activity counts for (A) male and (B) female PND 17 neonates over each subinterval, expressed as mean ± SEM.

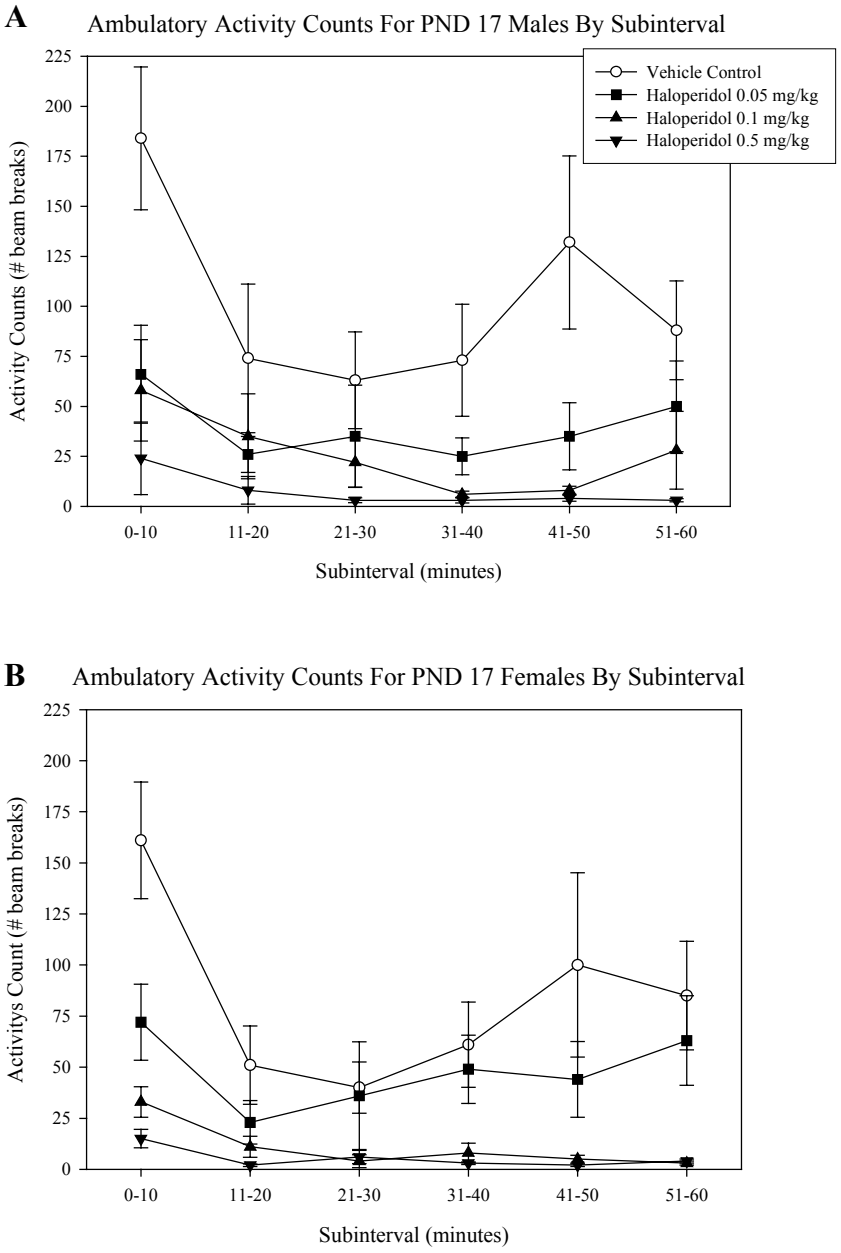


Figure 6: Mean ambulatory activity counts for (A) male and (B) female PND 17 neonates over each subinterval, expressed as mean ± SEM.

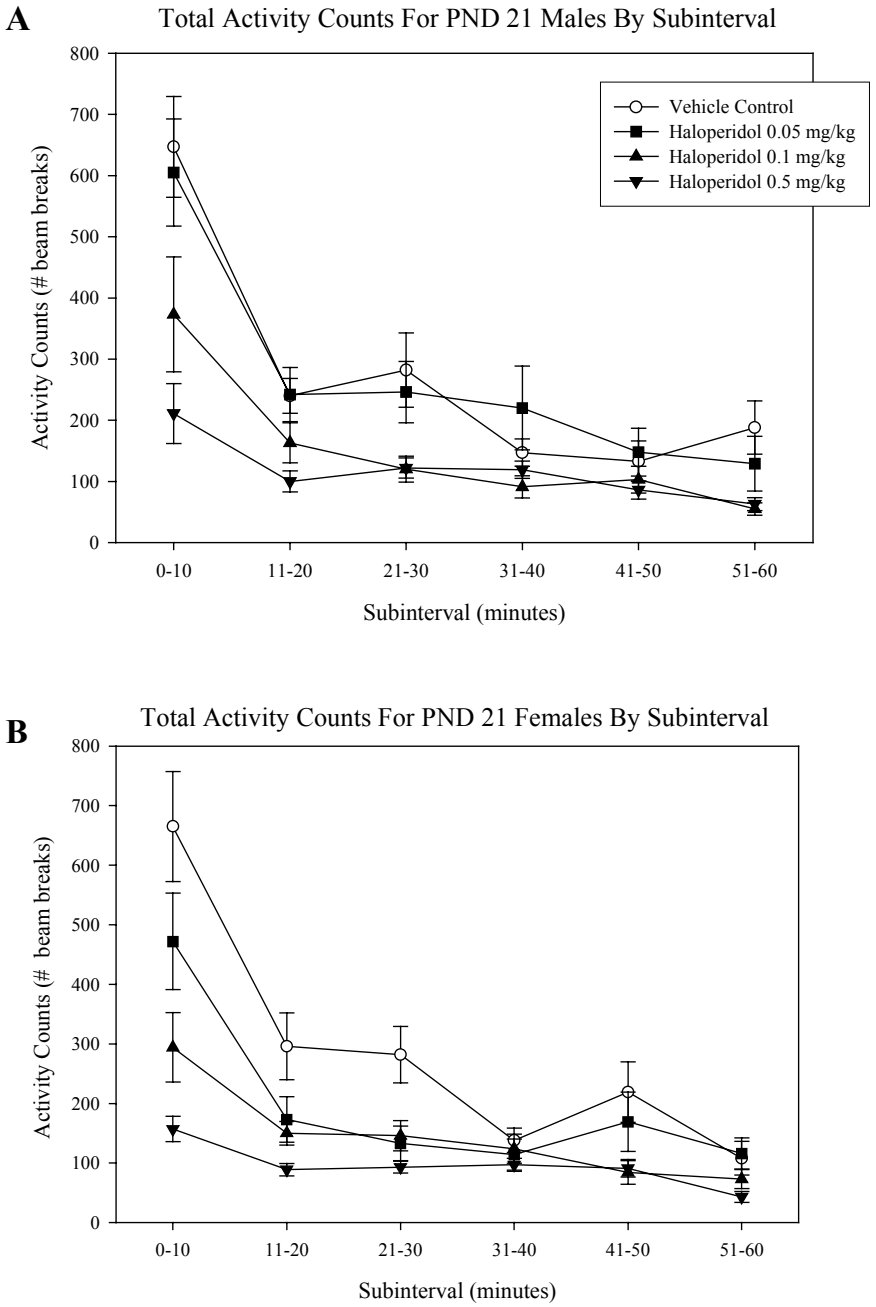


Figure 7: Mean total activity counts for (A) male and (B) female PND 21 neonates over each subinterval, expressed as mean ± SEM.

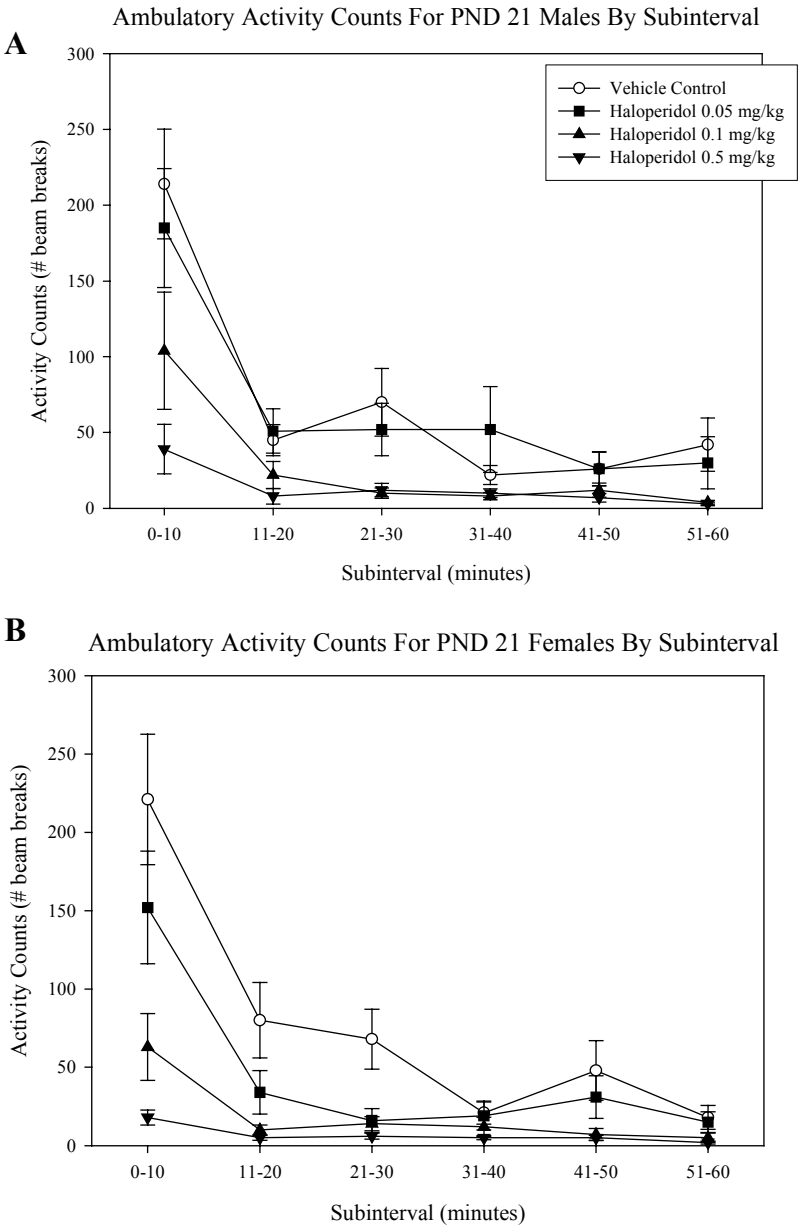


Figure 8: Mean ambulatory activity counts for (A) male and (B) female PND 21 neonates over each subinterval, expressed as mean ± SEM.

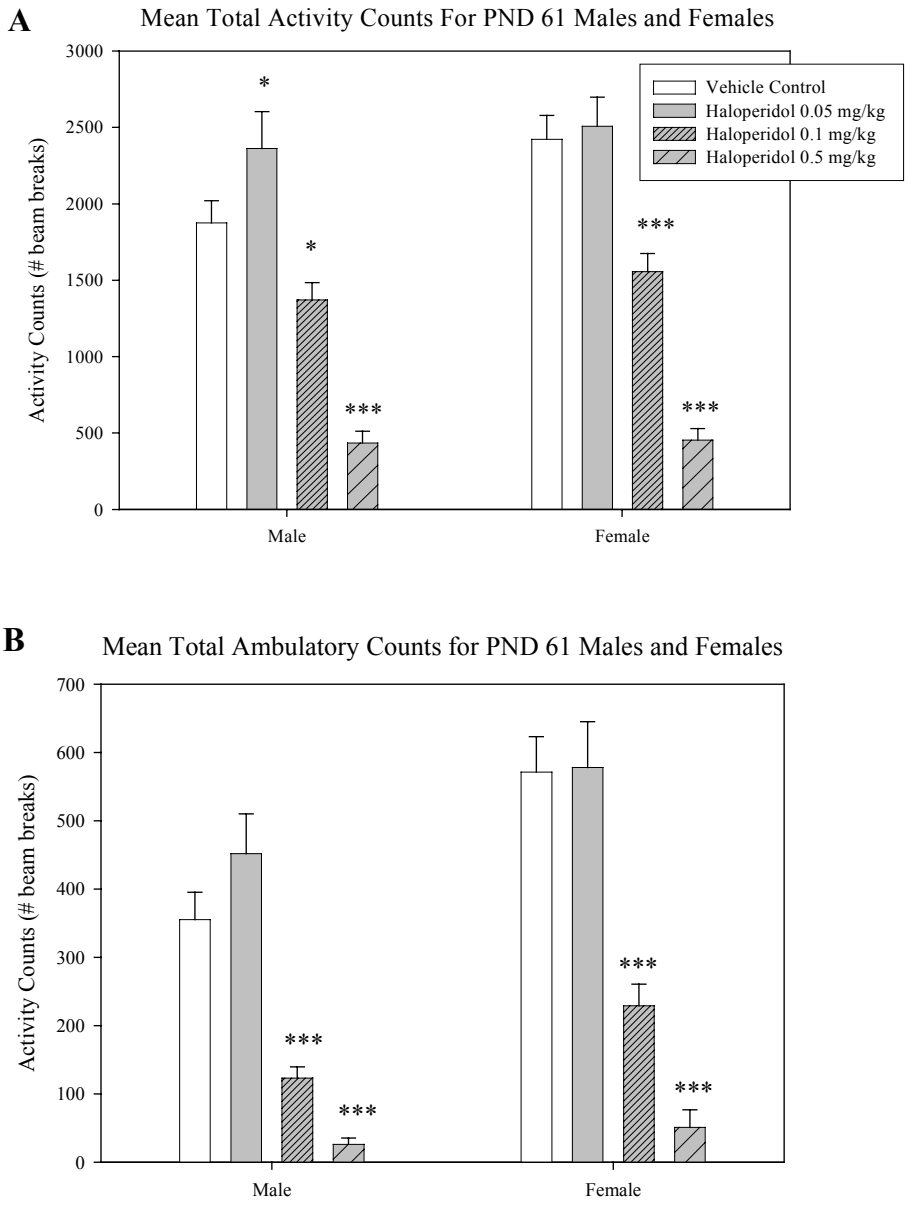
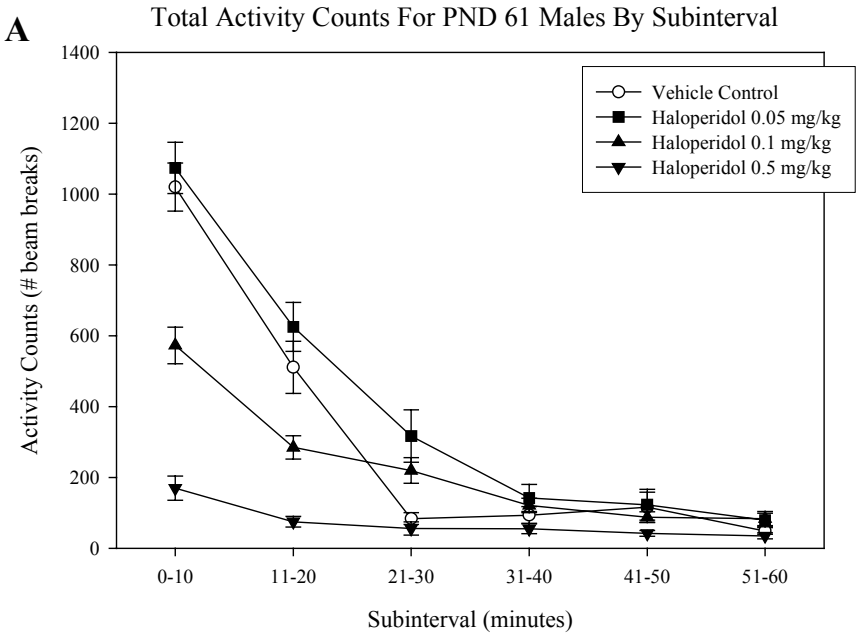


Figure 9: Mean total activity and ambulatory activity counts for (A) male and (B) female PND 61 young adults, expressed as mean ± SEM. Significance between the treatment and vehicle control group is indicated by *$p<0.05$ and ***$p<0.001$.



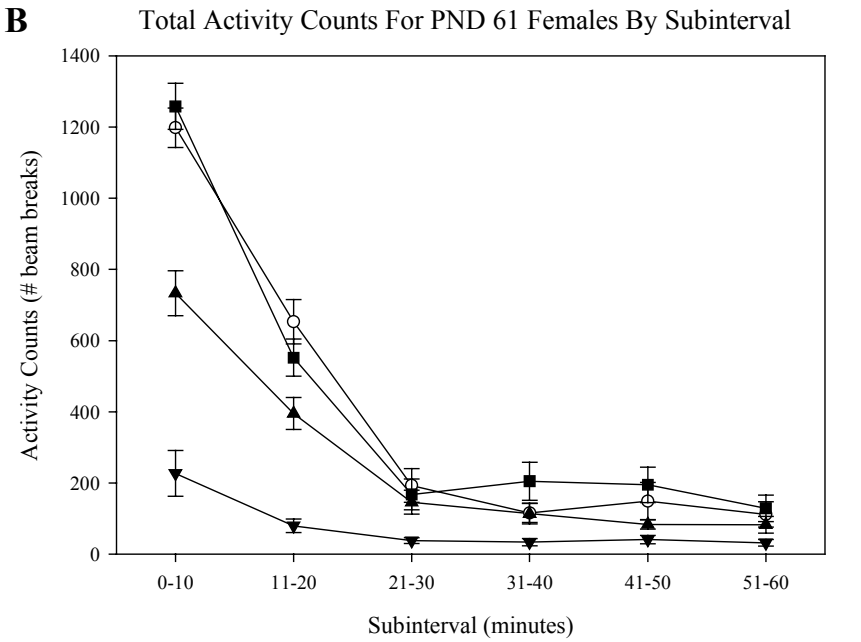


Figure 10: Mean total activity counts for (A) male and (B) female PND 61 young adults over each subinterval, expressed as mean ± SEM.

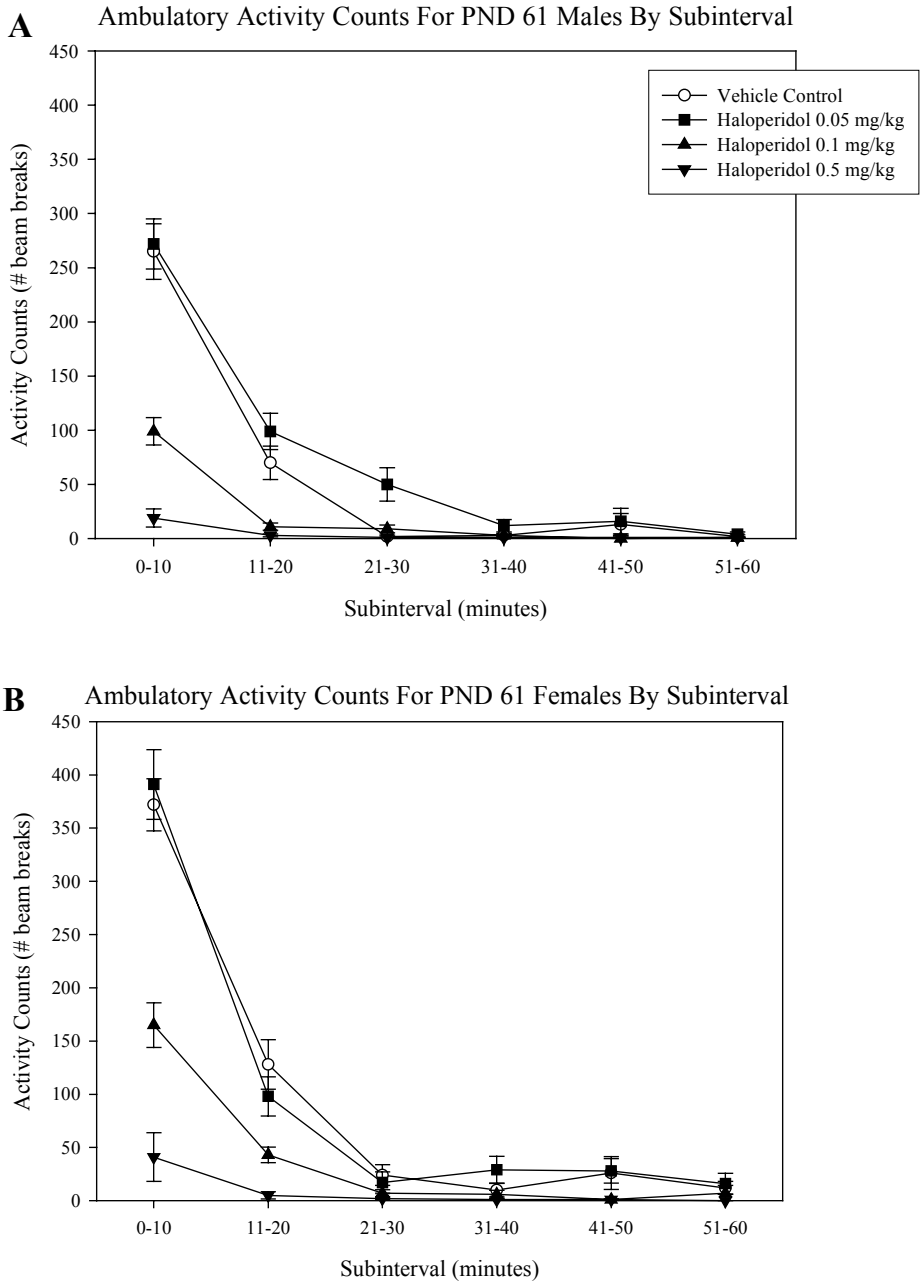


Figure 11: Mean ambulatory activity counts for (A) male and (B) female PND 61 young adults over each subinterval, expressed as mean ± SEM.

STUDY TITLE

A POSITIVE CONTROL VALIDATION
STUDY OF LOCOMOTOR ACTIVITY IN RATS

STUDY NUMBER

WIL-99441

STUDY DIRECTOR

Melissa J. Beck, PhD

STUDY INITIATION DATE

26 October 2007

STUDY COMPLETION DATE

27 May 2008

PERFORMING LABORATORY

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-8946

STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS

The purpose of the study was to validate the use of the Kinder Scientific MotorMonitor System in our laboratory and to demonstrate the ability to detect increases in locomotor activity using this system. Therefore, this page has been intentionally left blank.

1. ABSTRACT

The objective of this study was to demonstrate the ability of the Kinder Scientific MotorMonitor System to detect increases in activity in response to nicotine and amphetamine within the U.S. EPA OPPTS 870.6300 (Developmental Neurotoxicity), OECD 426 (Developmental Neurotoxicity) and ICH 4.1.2 (Pre- and Postnatal Development) guidelines. Nicotine and amphetamine were administered to male and female Sprague-Dawley Crl:CD rats 3 and 15 minutes, respectively, prior to assessment of locomotor behavior with the Kinder Scientific MotorMonitor System. Nicotine was administered at a dosage level of 0.1 or 0.5 mg/kg by a single intraperitoneal injection to neonatal rats on postnatal days (PND) 13, 17 and 21. Amphetamine was administered at a dosage level of 1 or 3 mg/kg by a single intraperitoneal injection to young adult rats (male and female) on PND 61 and at a dosage level of 0.2 or 1 mg/kg to young adult PND 61 females. Nicotine caused an increase in locomotor activity (mean total and ambulatory activity) in male and female neonatal rats at PND 13, 17 and 21. The habituation profile was evident in the PND 17 and 21 males and females. In a similar manner, amphetamine stimulated locomotor behavior in male and female rats at PND 61, causing both total and ambulatory activity to increase. The subsequent female-only groups (0.2 and 1 mg/kg amphetamine) exhibited a dose response with increased total and ambulatory activity compared to controls. In the PND 61 males and females (given 1 or 3 mg/kg amphetamine), the habituation profile was only present in the control and 3 mg/kg amphetamine treatment groups, whereas the habituation profile was present in the female-only PND 61 control and 0.2 mg/kg amphetamine groups. The experimental design used in this study demonstrated that WIL Research can detect locomotor effects of nicotine and amphetamine using the Kinder Scientific MotorMonitor System, and that the results can be considered to validate methodologies for OPPTS 870.6300 and OECD 426 developmental neurotoxicity studies and ICH 4.1.2 pre- and postnatal development studies.

2. INTRODUCTION

The U.S. EPA Guideline OPPTS 870.6300 and OECD Guideline 426 for developmental neurotoxicity studies indicate that locomotor activity testing should be performed on postnatal (PND) 13, 17, 21 and 60 (± 2 days). The guidelines, and also ICH 4.1.2 require that neurobehavioral endpoints such as motor behavior be included with standard toxicological indices to support product registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). Validation of laboratory methodologies and demonstration of the sensitivity of the equipment to detect test article-related changes are requirements of this guideline. WIL Research Laboratories, LLC chose to evaluate the use of the Kinder Scientific MotorMonitor System to measure locomotor behavior in control and test article-treated animals using nicotine and amphetamine, which are known to increase indices of locomotor behavior.

Both nicotine and amphetamine are widely used in the rodent animal model to measure various behaviors, specifically involving motor function. Treatment of rodents with nicotine increases motor function associated with the startle response (Gould et al., 2005; Lewis and Gould, 2003; Acri et al., 1995). Specifically, acute treatment of nicotine (0.1 and 0.5 mg/kg, s.c.) stimulates overall motor activity in both male neonates and young adults (Faraday et al., 2003). Interestingly, following delivery of nicotine to neonates, they exhibited increases in movements and rearing behaviors; whereas, young adults did not show these same levels (Faraday et al., 2003). This same stimulatory effect of nicotine is also present in females treated with similar levels of nicotine (0.1 and 0.5 mg/kg, s.c.) under similar testing parameters (Elliot et al., 2005). Nicotine, however, appears to be the most effective at increasing motor function in neonatal age ranges rather in than in young adults (Domino et al., 2001; Bevins and Besheer, 2001; Shoaib and Shippenberg, 1996).

Amphetamine at low concentrations (0.2, 0.4 and 0.8 mg/kg) increases overall locomotor behavior in adult rats in a dose-dependent manner (Mobini et al., 2000). The same trend is also present when compared to moderately higher doses of amphetamine (2 mg/kg), which show significant dose-dependent increases in locomotor activity (Yates et al.,

2007; Chatterjie et al., 1998). This noted effect of amphetamine increasing of horizontal and vertical motor activity, total distance covered, and stereotypic behaviors for up to 2 hours post-treatment (Gaytan et al., 1996). Although still elevated when compared to control animals, amphetamine at even higher doses (6, 10, 12, 16, and 20 mg/kg) actually becomes less effective at increasing the distance covered and other general locomotor-related behaviors (Yates et al., 2007).

3. MATERIALS AND METHODS

3.1. TEST SPECIES AND HUSBANDRY

Sprague-Dawley Crl:CD(SD) rats were obtained from Charles River Laboratories, Inc. (Raleigh, NC, USA). Twenty females with litters (5 pups/sex) were ordered to provide 20 rats/sex/group for testing on PND 13, 17 and 21. The breeder females were individually housed in plastic maternity cages with nesting material (Bed-O'Cobs®). The dams and pups remained in these cages until euthanasia on lactation day/PND 21. For the PND 61 groups, 84 young adult rats/sex were ordered for startle response testing of 80 rats/sex. The animals were housed 2-3/cage (by sex) for 1 week, then individually in suspended wire mesh cages until euthanasia.

Environmental controls were set to maintain temperature at 71 ± 5º F and relative humidity between 30–70%. Air handling units provided a minimum of 10 fresh air changes per hour. Fluorescent lighting, controlled by timers, provided illumination for a 12-hour (6:00 a.m. – 6:00 p.m.) light/dark photoperiod. Temperature and relative humidity were monitored continuously. Reverse osmosis-purified water and PMI Nutrition International, Inc. Certified Rodent LabDiet® 5002 were offered *ad libitum* during the course of the study.

3.2. TEST MATERIAL AND PREPARATION

(-)-Nicotine Hydrogen Tartrate Salt was purchased from Sigma Aldrich, St.Louis, MO, USA. An appropriate amount of nicotine was mixed with the vehicle (0.9% sodium chloride for injection) to produce dosing concentrations of 0.005 and 0.025 mg/mL with a corresponding dosage volume of 20 mL/kg. Dosing solutions were prepared on each day of dose administration.

D–Amphetamine Sulfate was purchased from Sigma Aldrich, St. Louis, MO. An appropriate amount of amphetamine, corrected for salt content, was mixed with the vehicle (0.9% sodium chloride for injection) to produce dosing concentrations of 0.2, 1 and 3 mg/mL with a corresponding dosage volume of 1 mL/kg. Dosing solutions were prepared on each day of dose administration.

On each day of dose administration, a sufficient amount of vehicle was dispensed for administration to all control groups.

3.3. EXPERIMENTAL DESIGN

For the neonatal phase, four groups of 20 rats/sex received an intraperitoneal injection of nicotine at 0, 0.1 or 0.5 mg/kg on PND 13, 17 and 21, approximately 3 minutes prior to assessment of locomotor behavior. For the young adult phase, amphetamine was administered by an intraperitoneal injection to four groups of 20 rats/sex at 0, 1 or 3 mg/kg on PND 61, approximately 15 minutes prior to assessment of locomotor behavior. In addition, 3 separate groups of 20 female rats/group at 0, 0.2 or 1 mg/kg on PND 61 were also administered amphetamine by intraperitoneal injection approximately 15 minutes prior to locomotor assessment. The corresponding dosage volumes were 20 mL/kg for nicotine and 1 mL/kg for amphetamine. All rats were observed twice daily for moribundity and mortality, once in the morning and once in the afternoon until euthanasia. Body weights and clinical observations were recorded on each day of dose administration. The observations included, but were not limited to evaluations for changes in appearance of skin and fur, eyes, mucous membranes, respiratory and circulatory systems, autonomic and central nervous systems, somatomotor activity and behavior. Additional observations, if needed, were documented in the study records. The following table summarizes the testing paradigm:

Neonatal Phase (Postnatal Day 13, 17 and 21)

Group Number	Test Article	Dosage Level (mg/kg)	Number of Males[a]	Number of Females[a]
1	Vehicle Control	0	20	20
2	Vehicle Control	0	20	20
3	Nicotine	0.1	20	20
4	Nicotine	0.5	20	20

a- Animals used for neonatal phase assessments was selected from 20 litters for PND 13, 17 and 21 testing, such that 1 rat/sex/litter was assigned to each group.

Young Adult Phase (Postnatal Day 61)

Group Number	Test Article	Dosage Level (mg/kg)	Number of Males	Number of Females
1	Vehicle Control	0	20	20
2	Vehicle Control	0	20	20
3	Amphetamine	1	20	20
4	Amphetamine	3	20	20

Young Adult Phase (Postnatal Day 61; Females Only)

Group Number	Test Article	Dosage Level (mg/kg)	Number of Females
1	Vehicle Control	0	20
2	Amphetamine	0.2	20
3	Amphetamine	1	20

3.4. BEHAVIORAL TESTING

Twenty neonatal animals/sex/group were assigned to the locomotor activity tests performed on PND 13, 17 and 21, and 20 young adult animals/sex/group with an additional 20 young adult females/group were assigned to the locomotor activity test performed on PND 61 using the automated Kinder Scientific MotorMonitor System (Kinder Scientific, LLC, Poway, CA, USA). The test session was 60 minutes in duration, consisting of 6 subintervals lasting 10 minutes each. Locomotor activity was evaluated as total and ambulatory activity counts obtained over each subinterval (0-10 minutes, 11-20 minutes, 21-30 minutes, 31-40 minutes, 41-50 minutes and 51-60 minutes) and the entire 60-minute session.

3.5. STATISTICAL ANALYSIS

All analyses were two-tailed for minimum significance levels of 5% and 1%. All statistical tests were performed by a computer with appropriate programming as referenced below. Total and ambulatory counts were analyzed, by sex and session, with a repeated measure analysis of variance (RANOVA). Factors in the model included treatment group (TRT), time interval (TIME), and the interaction of time interval and treatment group (TRT*TIME). The SAS® procedure PROC MIXED was used for analysis with the random effect of animal included as the repeated measurement. The

covariance structure across time was selected by comparing Akaike's Information Criterion.

The monotonic dose-response relationship was evaluated using sequential linear trend tests based on ordinal spacing of dose levels. The linear dose by time interaction was evaluated and, if significant at the 0.05 level, trend tests on treatment means were performed at the 0.05 level for each time interval. If the linear dose by time interaction was not significant, the trend test was conducted across the pooled time intervals of the entire session only.

Nonmonotonic dose responses were evaluated whenever no significant linear trends were detected but TRT and/or TRT*TIME interaction was significant at the 0.01 level. Within the framework of the RANOVA, pairwise comparisons were made for each individual test article-treated group with the control group through linear contrasts. If TRT*TIME was significant, the comparisons were conducted for each time interval. If only the TRT effect was significant, the comparisons were conducted across the pooled time intervals of the entire session. These nonmonotonic dose-response comparisons were conducted at the 0.01 significance level.

4. RESULTS AND DISCUSSION

The ontogenic profile of activity in control animals was demonstrated by the Kinder Scientific MotorMonitor System when examining both the mean total and mean ambulatory activity counts from PND 13, 17 and 21 males and females (Figure 1A and B, Figure 2A and B). This behavioral profile of motor function is evident by the relatively low activity in PND 13 neonates, followed by an increase in activity at PND 17 and then a decrease in activity at PND 21. This is consistent with the development of motor behavior in male and female neonates when exposed to a novel environment over these three time points (PND 13, 17 and 21).

Total activity counts measured over each subinterval by the Kinder Scientific MotorMonitor System in PND 13 male and female treatment groups (Figure 3A and B) showed a slight tendency of nicotine to increase activity in males and females at 0.5 mg/kg. This effect was more evident in the ambulatory activity counts over subinterval 1-10 (Figure 4A and B). For both total and ambulatory activity counts in the PND 13 male and female high nicotine groups (0.5 mg/kg) there was a marked drop from subinterval 1-10 to 11-20, after which there was no distinction between groups. This initial elevation is the first sign in the development of an habituation profile, and also supports the effect of nicotine increasing motor activity that has been documented in the literature (Domino et al., 2001; Bevins and Besheer, 2001; Shoaib and Shippenberg, 1996).

The PND 17 male (0.1 and 0.5 mg/kg) and female (0.5 mg/kg) nicotine treatment groups exhibited increased total and ambulatory locomotor behavior over all of the subintervals (Figure 1A and B, Figure 2A and B). The apparent greater effect of nicotine in the PND 17 males and females (compared to PND 13) may be due to the tendency of motor behavior to increase in this age group. Examining each subinterval during behavioral assessment indicated that the nicotine-treated males and females tended to be more active (total and ambulatory) than the control groups over the initial 3 subintervals (Figure 5A and B, Figure 6A and B). This increased level of motor activity is comparable to the increased activity measurements at similar doses present in the literature (Shoaib and Shippenberg, 1996; Bevins and Besheer, 2001; Faraday et al., 2003; Elliot et al., 2005).

In addition, an habituation profile was present in each PND 17 male and female group over the six subintervals.

The nicotine treatment effect, primarily at 0.5 mg/kg, also resulted in an increased mean total and ambulatory activity in the PND 21 males and females (Figure 1A and B, Figure 2A and B). This effect of nicotine was apparently dose dependent for both males and females, with the 0.5 mg/kg having the greatest level of activity. The effect of nicotine on PND 21 motor activity was also more pronounced for the total and ambulatory activity measurements taken over all six subintervals (Figure 7A and B, Figure 8A and B). In addition, the development of the habituation profile was more evident in the PND 21 nicotine-treated males and females. Even in this age group (PND 21), the effects of nicotine at 0.1 and 0.5 mg/kg are consistent with previously published behavioral assessment research (Shoaib and Shippenberg, 1996; Bevins and Besheer, 2001; Faraday et al., 2003; Elliot et al., 2005).

The use of the Kinder Scientific MotorMonitor System showed that amphetamine treatment (1 and 3 mg/kg) increased PND 61 male and female mean total and ambulatory activity counts (Figure 9A and B). This effect was not dose dependent, because the most activity was present in the 1 mg/kg amphetamine male and female treatment groups. However, addition of the amphetamine-treated (0.2 and 1 mg/kg) PND 61 females indicated that there was a dose-dependent effect of amphetamine (Figure 12A and B) on mean total and ambulatory activity counts. The 3 mg/kg amphetamine treatment in the previously mentioned PND 61 males and females resulted in substantially lower level of mean total activity than in the 1 mg/kg groups, although still above the control groups. This same decrease in activity was also present in the mean ambulatory data suggesting that generalized activity or movement (i.e., shaking) was not substituted with an increase in ambulation. Reports in the literature do indicate that, although amphetamine acts to increase motor activity, there is a point where amphetamine can become inhibitory in nature depending on the strain, age, gender and testing paradigm used (Gaytan et al., 1996; Mobini et al. 2000; Chatterjie et al., 1998; Yates et al., 2007).

Similarly, amphetamine treatment (1 and 3 mg/kg) of the young adult PND 61 males and females (Figure 10A and B) increased the total activity counts by subinterval in a non-dose-related manner. In addition, the ambulatory activity by subinterval for males and females (Figures 11A and B) was also increased for the majority of motor activity assessment following amphetamine treatment (1 and 3 mg/kg). An habituation profile was present for both total and ambulatory activity for the PND 61 control animals, with the 3 mg/kg amphetamine treatment group only showing some possible habituation regarding ambulatory activity. The 1 mg/kg treatment groups for both males and females lacked habituation, with the total and ambulatory activity remaining elevated over all subintervals. In a similar manner to the total activity, the PND 61 (0, 0.2 and 1 mg/kg) treated females exhibited a dose response for ambulatory activity (Figure 13 A and B). Overall, the effect of amphetamine increasing activity above baseline, as well as inhibiting activity at higher amphetamine doses (3 mg/kg) in the PND 61 males and females, is consistent with the previously published literature (Gaytan et al., 1996; Mobini et al. 2000; Chatterjie et al., 1998; Yates et al., 2007).

In conclusion, the motor activity data (i.e. total activity and ambulatory activity) for Sprague Dawley Crl:CD (SD) rats generated by the Kinder Scientific MotorMonitor System are consistent with previously reported effects of nicotine and amphetamine on motor behavior. This motor monitoring system is therefore capable and sensitive enough to measure increases in motor activity in neonatal and young adult rodents with positive control agents such as nicotine and amphetamine.

5. REFERENCES

Acri, J.B.; Brown, K.J.; Saah, M.I.; Grunberg N.E. (1995) Strain and age differences in acoustic startle responses and effects of nicotine in rats. *Pharmacology Biochemistry and Behavior* **1995**, *50*. 191-198.

Bevins, R.A.; Besheer, J. Individual differences in rat locomotor activity are diminished by nicotine through stimulation of central nicotinic acetylcholine receptors. *Physiology and Behavior* **2001**, *72*, 237-244.

Chatterjie, N.; Sechzer, J.A.; Lieberman, K.W.; Alexander, G.J. Dextro-Naloxone counteracts amphetamine-induced hyperactivity. *Pharmacology Biochemistry and Behavior* **1998**, *59*, 271-274.

Domino, E.F. Nicotine induced behavioral locomotor sensitization. *Progress in Neuro-Psychopharmacological and Biological Psychiatry* **2001**, *25*, 59-71.

Elliott, B.M.; Faraday, M.M.; Phillips, J.M.; Grunberg, N.E. Adolescent and adult female rats differ in sensitivity to nicotine's activity effects. *Pharmacology Biochemistry and Behavior* **2005,** *80*, 567-575.

Faraday, M.M.; Elliott, B.M.; Phillips, J.M.; Grunberg, N.E. Adolescent and adult male rats differ in sensitivity to nicotine's activity effects. *Pharmacology Biochemistry, and Behavior* **2003,** *74*, 917-931.

Gaytan, O.; Swann, A.C.; Dafny, N. Effects of amphetamine at the beginning of the light cycle on indices of motor activity in the rat. *European Journal of Pharmacology* **1996**, *300*, 1-8.

Gould, T.J.; Rukstalis, M.; Lewis, M.C. Atmoxetine and nicotine enhance prepulse inhibition of acoustic startle in C57BL/6 mice. *Neuroscience Letters* **2005,** *377*, 85-90.

Lewis, M.C.; Gould, T.J. Nicotine and ethanol enhancements of acoustic startle reflex are mediated in part by dopamine in C57BL/6J mice. *Pharmacology Biochemistry and Behavior* **2003,** *76*, 179-186.

Mobini, S.; Chiang, T.J.; Ho, M.Y.; Bradshaw, C.M.; Szabadi, E. Comparison of the effects of clozapine, haloperidol, chlorpromazine and *d*-amphetamine on performance on a time-constrained progressive ratio schedule and on locomotor behaviour in the rat. *Psychopharmacology* **2000**, *152*, 47-54.

Shoaib, M.; Shippenberg, T.S. Adrenalectomy attenuates nicotine-induced dopamine release and locomotor activity in rats. *Psychopharmacology* **1996**, *128*, 343-350.

SAS® Proprietary Software, Version 8.2; SAS Institute, Inc.: Cary, NC, **1999-2001**.

Yates, J.W.; Meij, J.T.A.; Sullivan, J.R.; Richtand, N.M.; Yu, L. Bimodal effect of amphetamine on motor behaviors in C57BL/6 mice. *Neuroscience Letters* **2007**, *427*, 66-70.

6. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Report Submitted By:

[redacted]

Assistant Director, Neurosciences
Study Director

27 May 2008
Date

Report Prepared By:

[redacted]

Staff Toxicologist, Neurosciences

27 May 2008
Date

Report Reviewed By:

[redacted]

Project Specialist, Neurosciences

27-May-2008
Date

[redacted]

Associate Director, Developmental and
Reproductive Toxicology

27 May 2008
Date

FIGURES 1 - 13

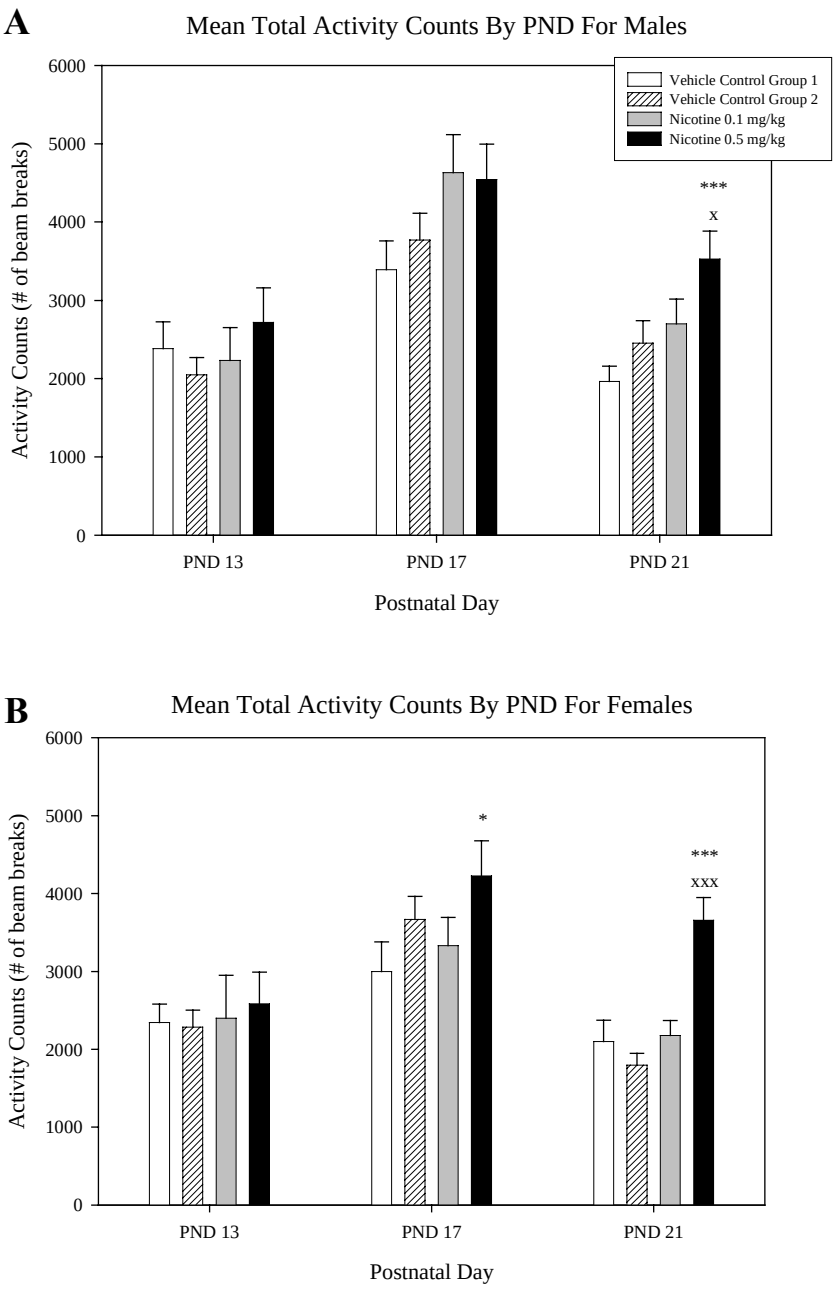


FIGURE 1. Postnatal days 13, 17, and 21 (A) male and (B) female mean total activity counts averaged over all subintervals, expressed as mean ± SEM. Significance between the treatment and vehicle control group 1 is indicated by $^{*}p<0.05$ and $^{***}p<0.001$ and between the treatment and vehicle control group 2 is indicated by $^{x}p<0.05$ and $^{xxx}p<0.001$.

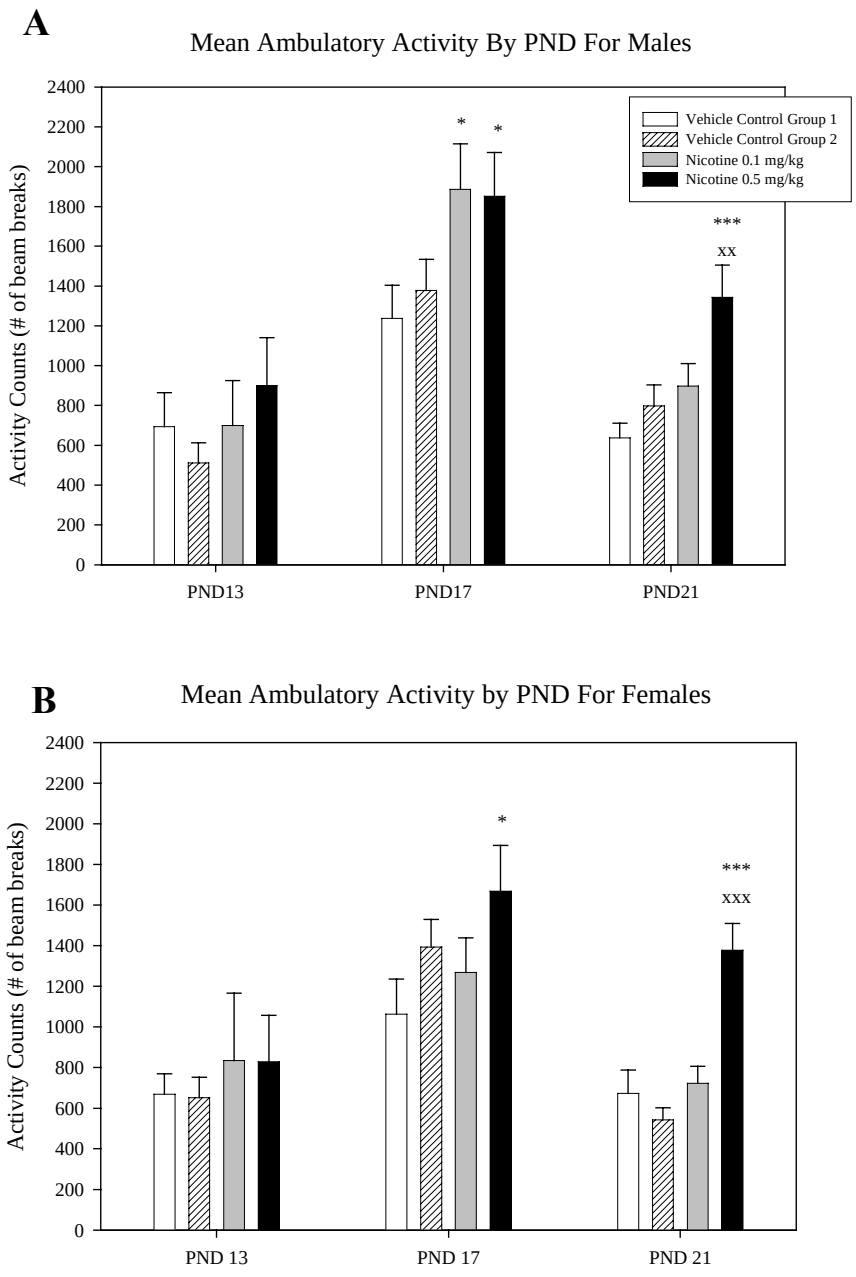


FIGURE 2. Postnatal days 13, 17, and 21 (A) male and (B) female mean ambulatory activity counts averaged over all subintervals, expressed as mean ± SEM. Significance between the treatment and vehicle control group 1 is indicated by $^{*}p<0.05$ and $^{***}p<0.001$ and to group 2 is indicated by $^{xx}p<0.01$ and $^{xxx}p<0.001$.

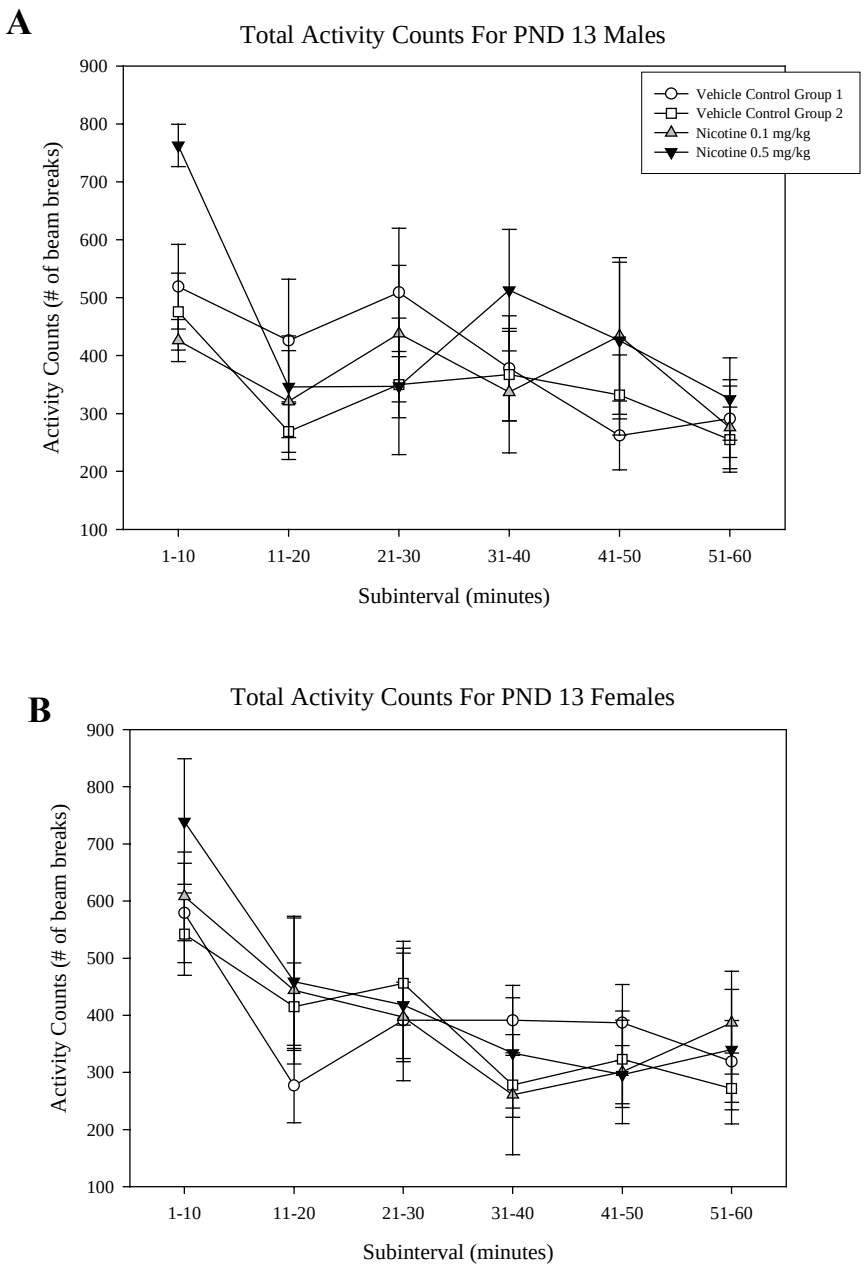


FIGURE 3. Postnatal day 13 (A) male and (B) female total activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

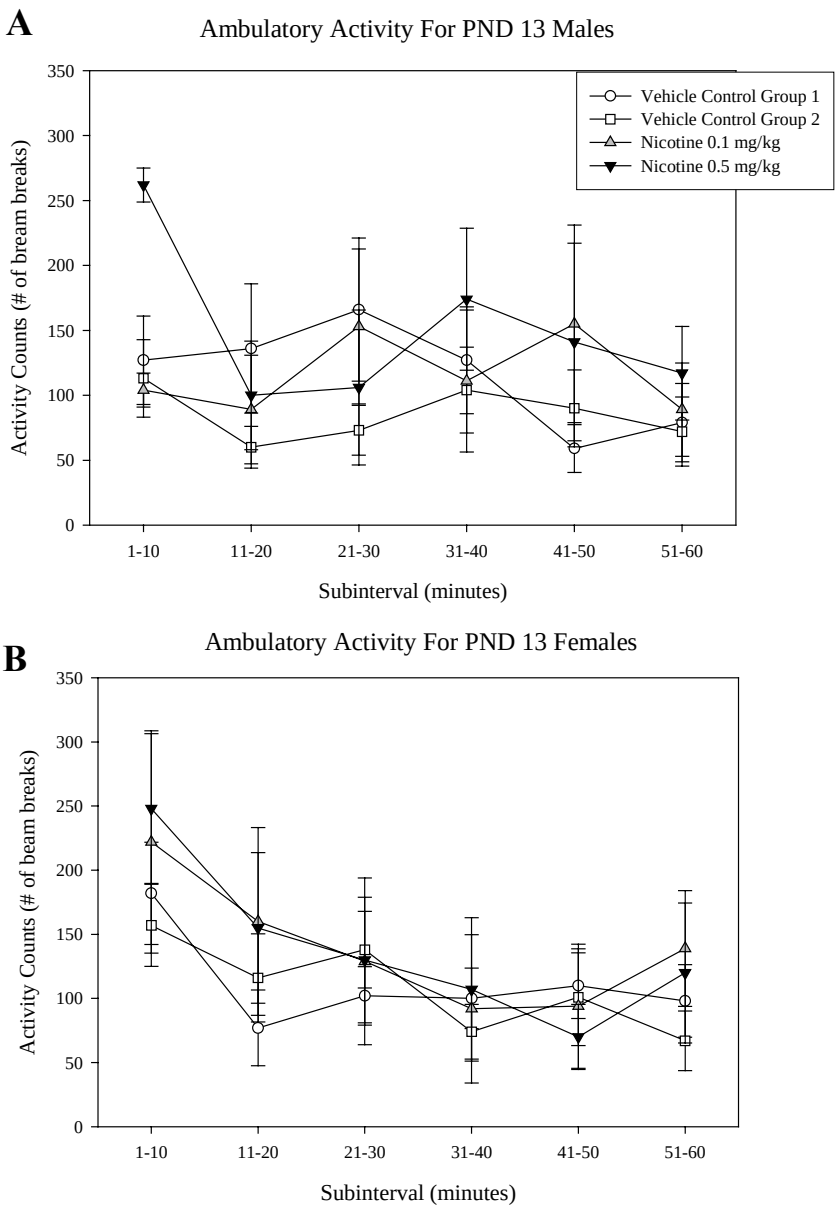


FIGURE 4. Postnatal day 13 (A) male and (B) female ambulatory activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

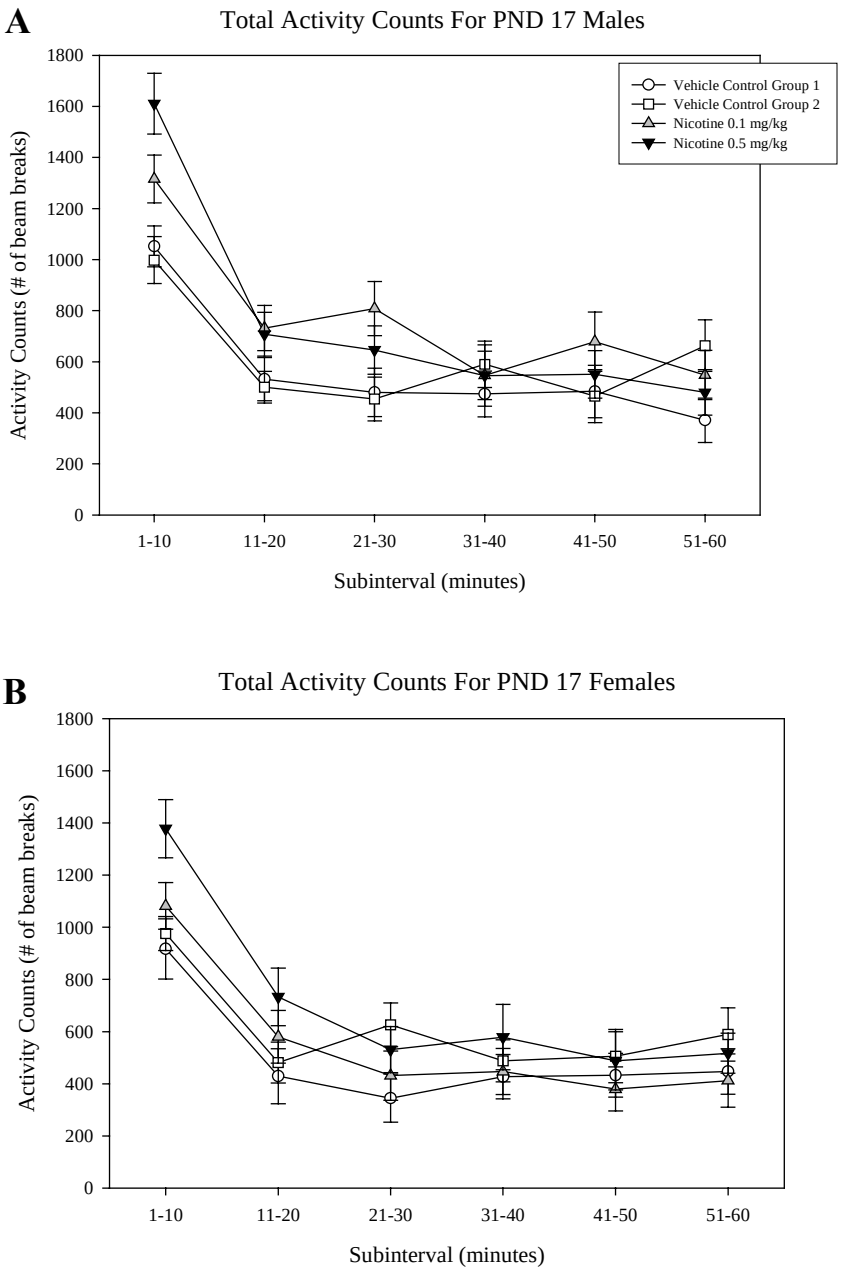


FIGURE 5. Postnatal day 17 (A) male and (B) female total activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

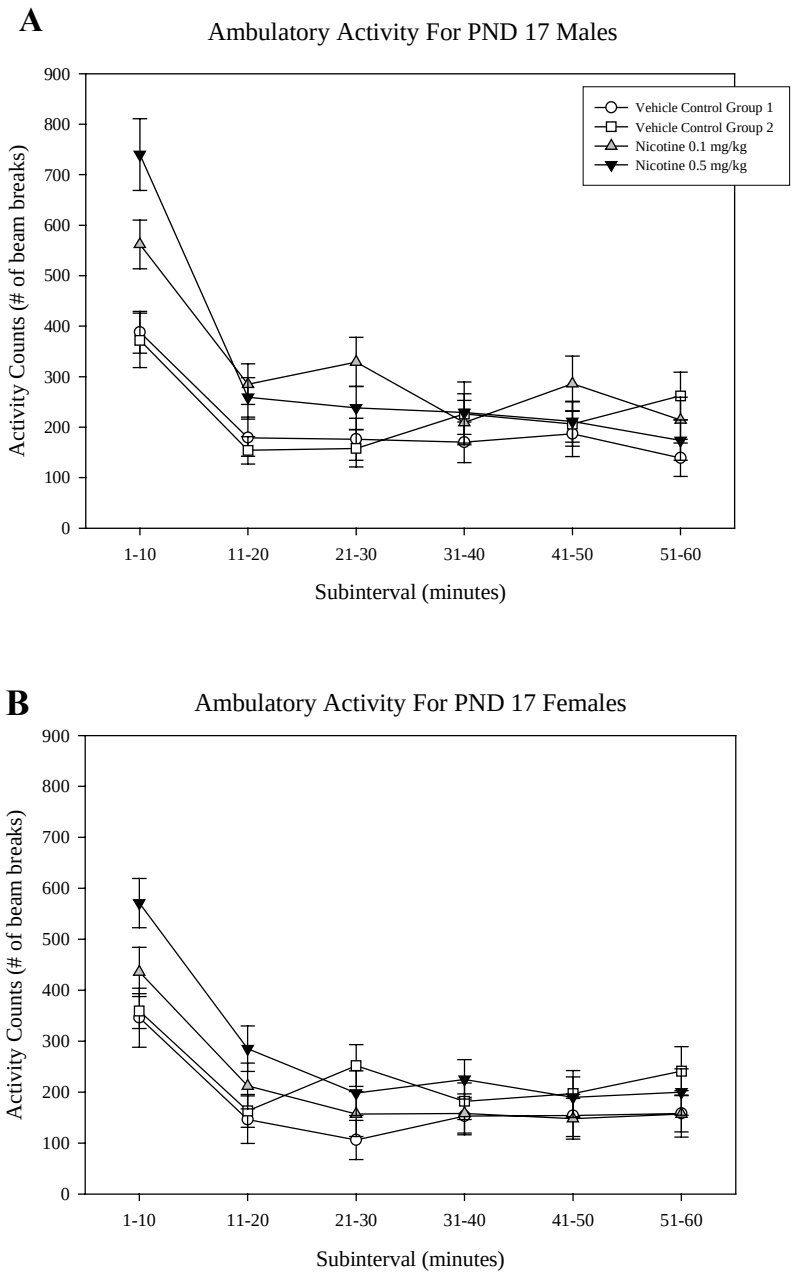


FIGURE 6. Postnatal day 17 (A) male and (B) female ambulatory activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

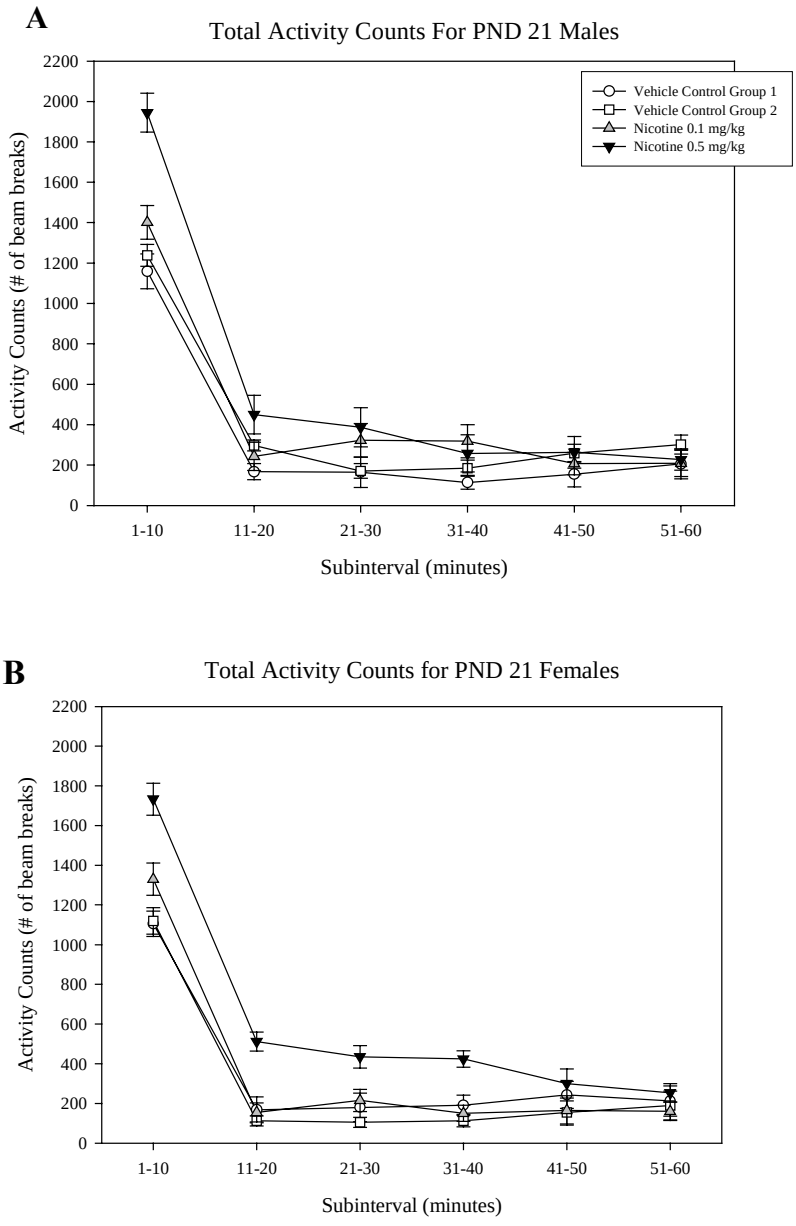


FIGURE 7. Postnatal day 21 (A) male and (B) female total activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

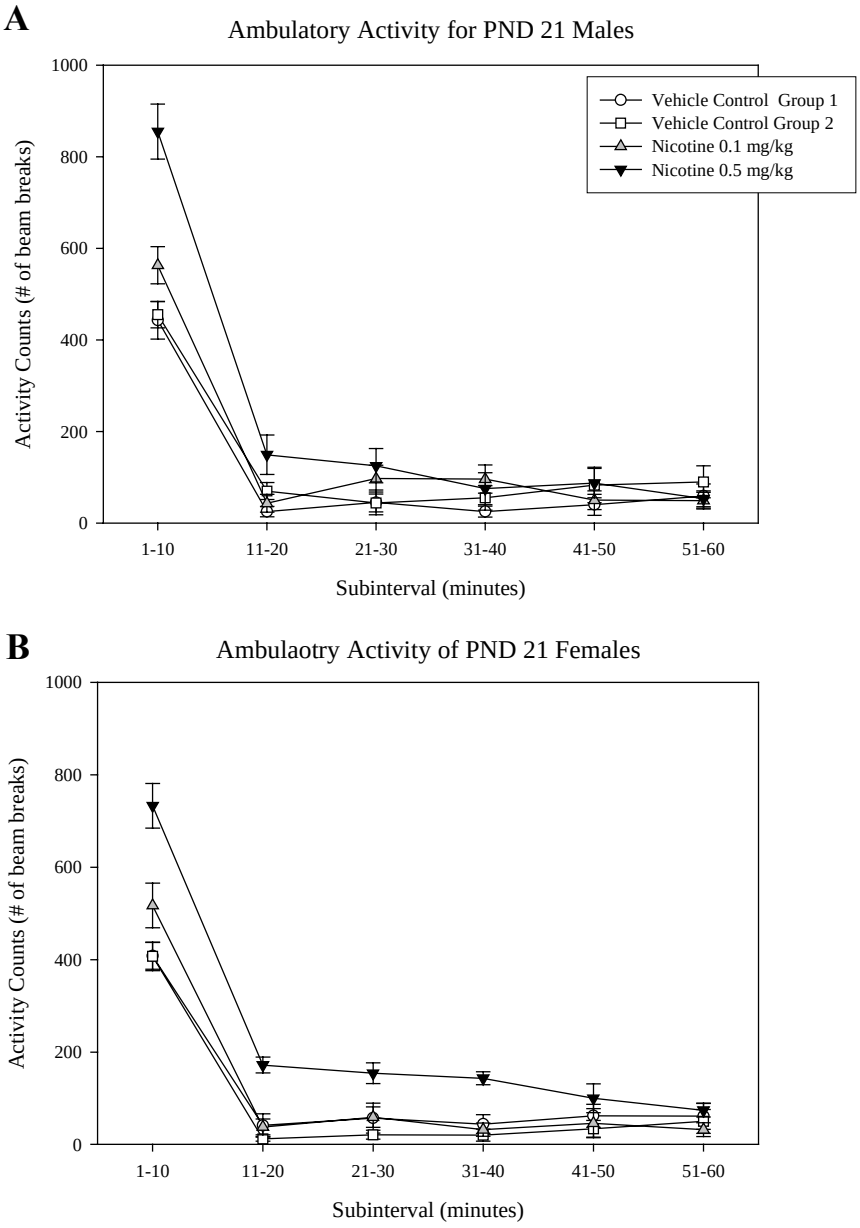


FIGURE 8. Postnatal day 21 (A) male and (B) female ambulatory activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

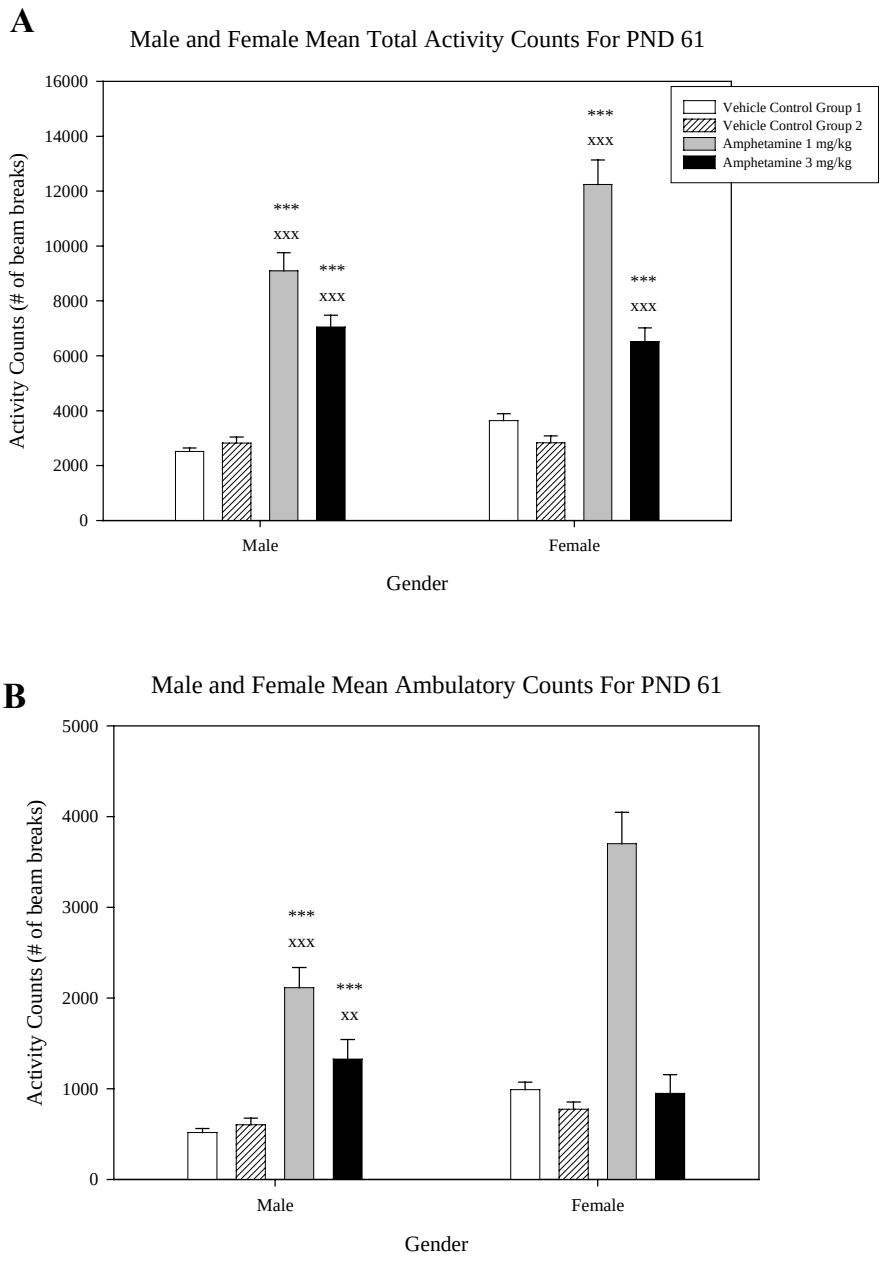


FIGURE 9. Postnatal day 61 male and female (A) mean total activity and (B) mean ambulatory activity averaged over all subintervals, expressed as mean ± SEM. Significance between the treatment and vehicle control group 1 is indicated by $^{***}p<0.001$ and between the treatment and vehicle control group 2 is indicated by $^{xx}p<0.01$ and $^{xxx}p<0.001$.

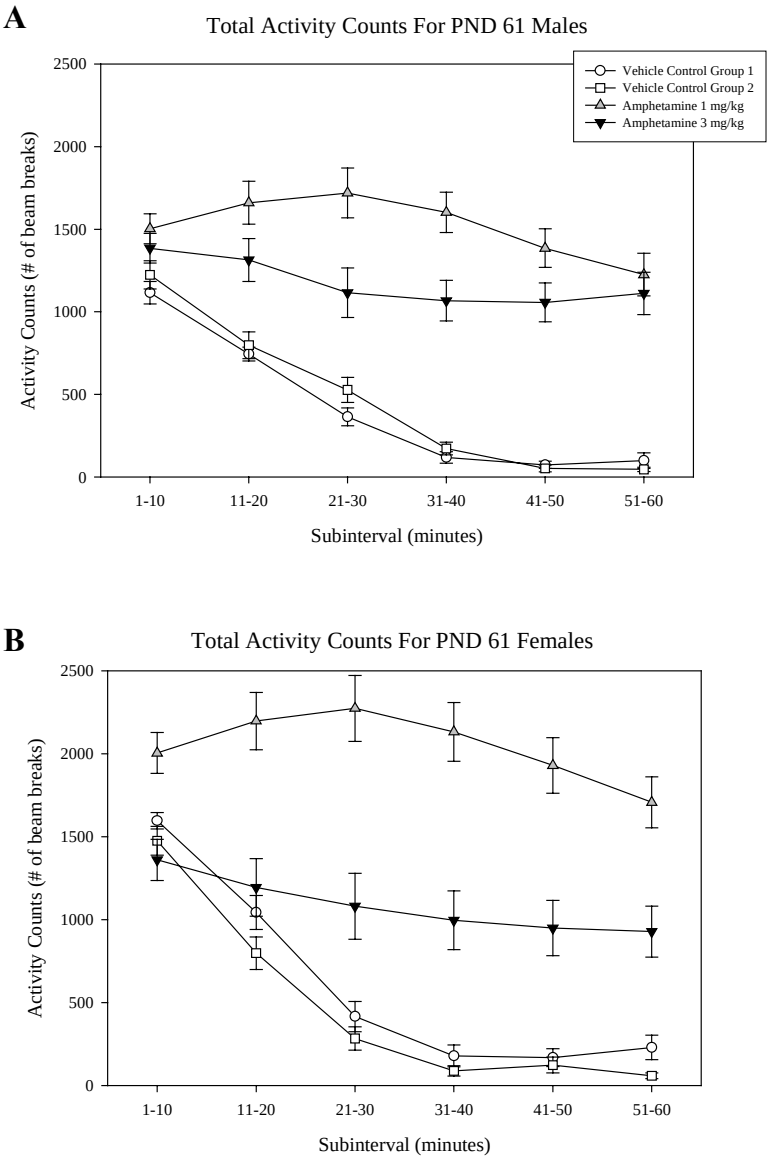


FIGURE 10. Postnatal day 61 (A) male and (B) female total activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

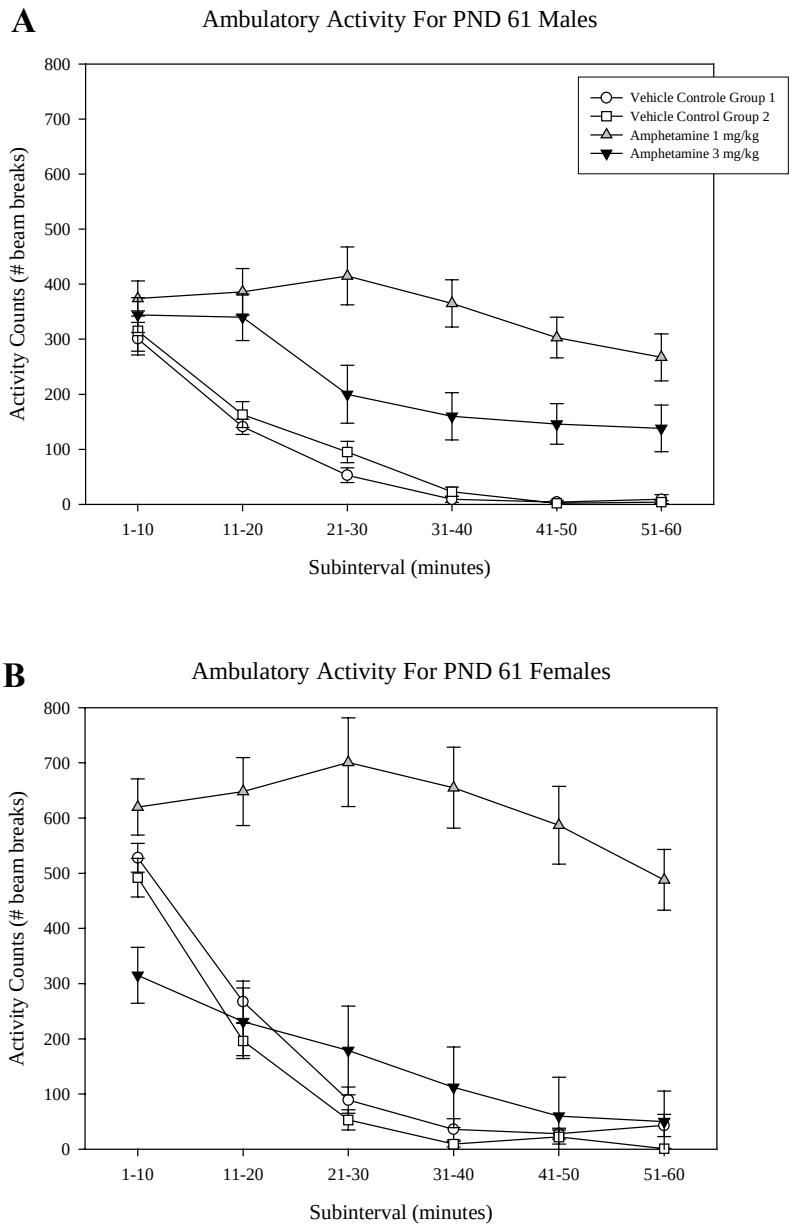


FIGURE 11. Postnatal day 61 (A) male and (B) female ambulatory activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM.

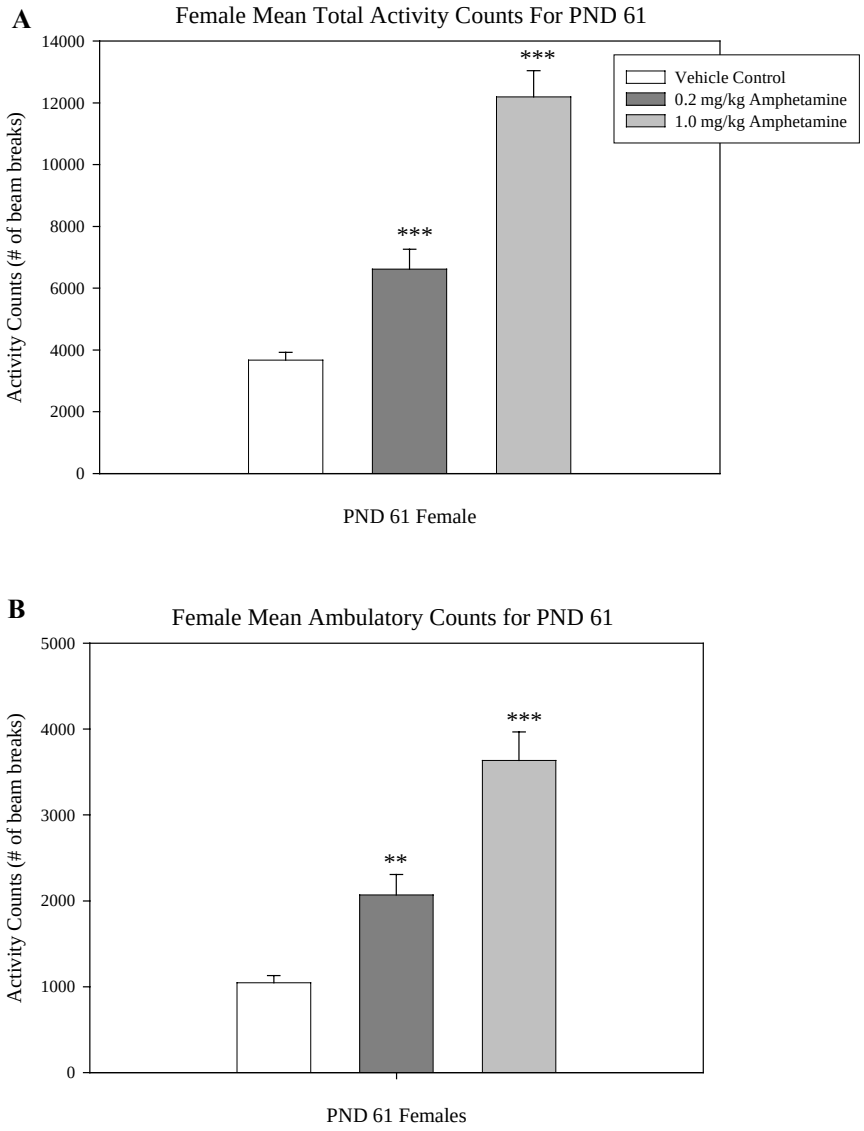


FIGURE 12. Postnatal day 61 female (A) mean total activity and (B) mean ambulatory activity averaged over all subintervals, expressed as mean ± SEM. Significance between the treatment and vehicle control group is indicated by $^{**}p<0.01$ and $^{***}p<0.001$.

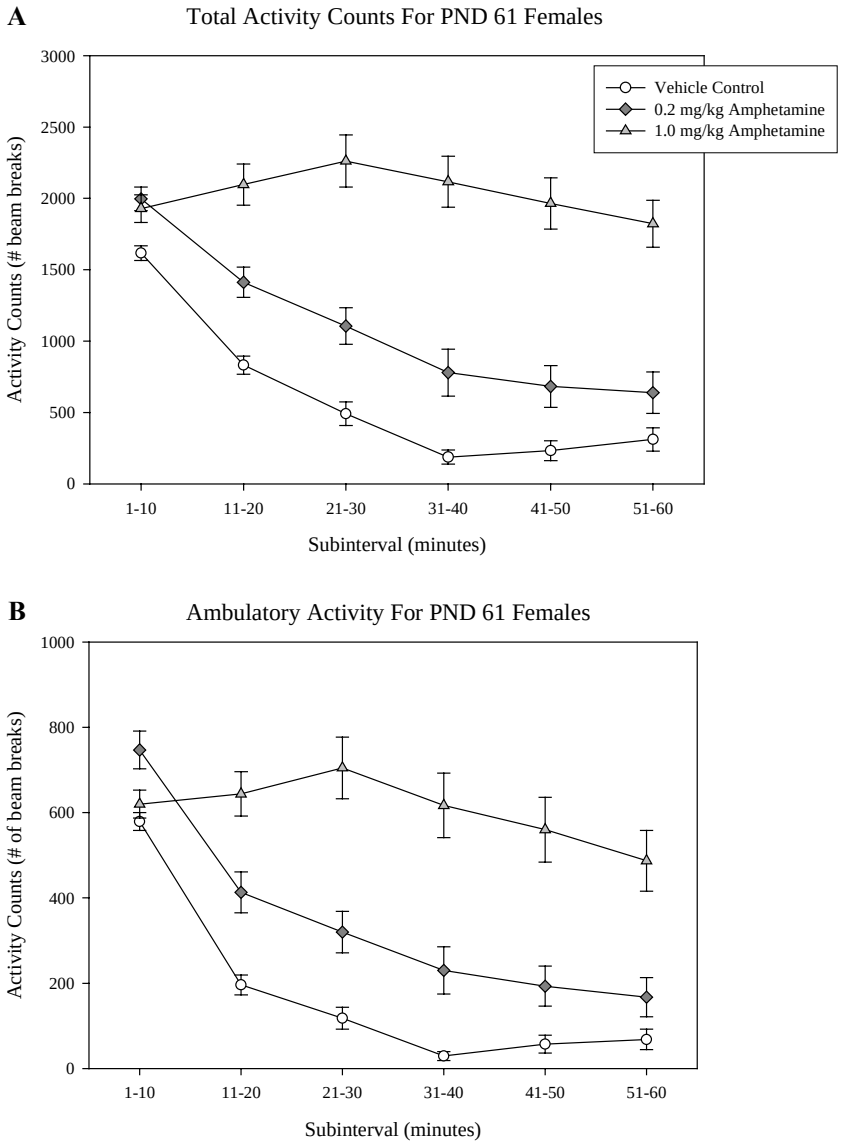


FIGURE 13. Postnatal day 61 female (A) total activity counts and (B) ambulatory activity counts or beam breaks taken over each subinterval, expressed as mean ± SEM

STUDY TITLE

A POSITIVE CONTROL ACUTE NEUROTOXICITY STUDY IN RATS

STUDY NUMBER

WIL-99443

STUDY DIRECTOR

[redacted]

STUDY INITIATION DATE

2 November 2007

STUDY COMPLETION DATE

5 September 2008

PERFORMING LABORATORY

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-8946

STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS

The purpose of the study was to validate the use of the Kinder Scientific MotorMonitor System in our laboratory and to demonstrate the ability to detect decreases in activity using this system as well as a functional observational battery (FOB). Therefore, this page has been intentionally left blank.

1. ABSTRACT

The objective of this study was to demonstrate the ability of the Kinder Scientific MotorMonitor System (Kinder Scientific, LLC, Poway, CA, USA) to detect decreases in activity in response to chlorpyrifos within the U.S. EPA Health Effects Guideline OPPTS 870.6200 (Neurotoxicity Screening Battery) and the Organization of Economic Cooperation and Development (OECD) Guidelines for Testing of Chemicals Guideline 424 (Neurotoxicity Study in Rodents). In addition, the study evaluated the ability to detect changes in behavior using a functional observational battery (FOB). Chlorpyrifos was administered at a single dose of 20 or 100 mg/kg by oral gavage 3.5 hours prior to behavioral assessment. Male and female Sprague Dawley Crl:CD (SD) rats (6 weeks of age) were evaluated using a Neurotoxicity Screening Battery consisting of FOB assessment and locomotor behavior. The FOB detected a general decrease in the initiation of movement (time to first step in the open field), body temperature and Rotarod performance, along with impaired gait and increased catalepsy time. Motor activity (i.e., total and ambulatory activity) measured by the Kinder Scientific MotorMonitor System showed a consistent decrease in mean activity by both males and females treated with 100 mg/kg chlorpyrifos. The experimental design used in this study demonstrated that WIL Research can detect behavioral changes in an FOB, as well as locomotor effects of chlorpyrifos using the Kinder Scientific MotorMonitor System, and that the results can be considered to validate methodologies for OPPTS Guideline 870.6200 and OECD Guideline 424.

2. INTRODUCTION

This study was conducted in accordance with the appropriate provisions of the U.S. EPA Health Effects Guideline (OPPTS 870.6200), Neurotoxicity Screening Battery and the OECD Guidelines for Testing of Chemicals Guideline 424, Neurotoxicity Study in Rodents. The exception is that the study assessments were be completed only during pretest and at the time of peak effect on study day 0. Validation of laboratory methodologies and demonstration of the sensitivity of the equipment to detect test article-related changes are requirements of these guidelines. WIL Research Laboratories, LLC chose to evaluate the use of the Kinder Scientific MotorMonitor System to measure locomotor behavior in control and test article-treated animals using chlorpyrifos, a known cholinesterase inhibitor used commonly in insecticides.

In rodents, a single dose of chlorpyrifos often results in the presence of tremors, increased lacrimation and salivation, loss of muscle tone, hypothermia, changes in gait, increased catalepsy times and inhibited pupil responsiveness (Moser 1995; Mattsson et al., 1996). When evaluated at the time of peak effect (approximately 3.5 hours post-administration) these effects, specifically regarding muscle tone and function, are consistent with the decreased motor activity observed at dose levels of 20, 50 and 100 mg/kg (Moser, 1995). This was also noted in other studies using higher dose levels (50, 100, 150 and 200 mg/kg), administered once by oral gavage, which were sufficient to cause generalized decreases in muscle tone and motor activity for both male and female adult rats (Mattsson et al., 1996). This same trend was also present in low-dose (3 to 12 mg/kg) chronic studies lasting several days to weeks using male and female rats (PND 30 and 40), where motor activity in the open field was inhibited (Carr et al., 2001). Further analysis of chlorpyrifos via alternative delivery routes identified impaired visual discrimination (following oral or subcutaneous administration at 50 mg/kg) and significantly lowered general activity in the behavioral test battery (following subcutaneous administration at 250 mg/kg) for up to 18 consecutive days (Bushnell et al., 2001).

3. MATERIALS AND METHODS

3.1. TEST SPECIES AND HUSBANDRY

Sprague Dawley Crl:CD(SD) rats were obtained from Charles River Laboratories, Inc. (Raleigh, North Carolina, USA). 48 males and females (nulliparous and non-pregnant) at 3 to 5 weeks of age were ordered for the in-life testing of 12 rats/sex/group for FOB and motor activity assessment starting at approximately 6 weeks of age. Upon receipt, animals were housed 2-3/cage by sex. Following acclimation, the animals were individually housed in clean suspended wire-mesh cages until euthanasia.

Environmental controls were set to maintain temperature at 71 ± 5º F and relative humidity between 30–70%. Air handling units provided a minimum of 10 fresh air changes per hour. Fluorescent lighting, controlled by timers, provided illumination for a 12-hour light (6:00 a.m. – 6:00 p.m.)/dark photoperiod. Temperature and relative humidity were monitored continuously. Reverse osmosis-purified water and PMI Nutrition International, Inc., Certified Rodent LabDiet® 5002 were offered *ad libitum* during the study.

3.2. TEST MATERIAL AND PREPARATION

Chlorpyrifos was purchased from Supelco, Bellefonte, PA, USA. An appropriate amount of chlorpyrifos was mixed with the vehicle (corn oil) to produce dosing concentrations of 4 and 20 mg/mL, with a corresponding dose volume of 5 mL/kg. Dosing solutions were prepared daily, stored at room temperature and protected from light prior to dispensation for dosing.

3.3. EXPERIMENTAL DESIGN

Functional observational battery assessments and locomotor activity (Kinder Scientific MotorMonitor System) were made at pretest and approximately 3.5 hours post-dose administration to 4 groups of 12 rats/sex/group on the day of chlorpyrifos administration. All rats were observed twice daily for moribundity and mortality, once in the morning and once in the afternoon until euthanasia. Body weight and clinical observations regarding general appearance were recorded on the day of dose administration. The observations included, but were not limited to evaluations for changes in appearance of skin and fur, eyes, mucous membranes, respiratory and circulatory systems, autonomic

and central nervous systems, somatomotor activity and behavior. The following table summarizes the testing paradigm:

Group Number	Test Article	Dose Level (mg/kg)	Number of Males	Number of Females
1	Vehicle Control	0	12	12
2	Vehicle Control	0	12	12
3	Chlorpyrifos	20	12	12
4	Chlorpyrifos	100	12	12

3.4. BEHAVIORAL TESTING

Twelve rats/sex/group were evaluated in the FOB and the Kinder Scientific MotorMonitor System at pretest and on study day 0. The FOB utilized was based on previously developed protocols which included: home cage, handling, open field, sensory, neuromuscular and physiological observations (Moser et al., 1991; Irwin, 1968; Gad, 1982; Moser et al., 1988; Haggerty, 1989; O'Donoghue, 1989). All animals were observed for the following parameters as described below:

3.4.1. HOME CAGE OBSERVATIONS

Posture
Convulsions/tremors
Feces consistency
Biting
Palpebral (eyelid) closure

3.4.2. HANDLING OBSERVATIONS

Ease of removal from cage
Lacrimation/chromodacryorrhea
Piloerection
Palpebral closure
Eye prominence
Red/crusty deposits
Ease of handling animal in hand
Salivation
Fur appearance
Respiratory rate/character
Mucous membranes/eye/skin color
Muscle tone

3.4.3. OPEN FIELD OBSERVATIONS (EVALUATED OVER A 2-MINUTE OBSERVATION PERIOD)

Mobility	Gait
Rearing	Arousal
Convulsions/tremors	Urination/defecation
Grooming	Gait score
Bizarre/stereotypic behavior	Backing
Time to first step (seconds)	

3.4.4. SENSORY OBSERVATIONS

Approach response	Touch response
Startle response	Tail pinch response
Pupil response	Eyeblink response
Forelimb extension	Hindlimb extension
Air righting reflex	Olfactory orientation

3.4.5. NEUROMUSCULAR OBSERVATIONS

Hindlimb extensor strength	Grip strength-hind and forelimb
Hindlimb foot splay	Rotarod performance

3.4.6. PHYSIOLOGICAL OBSERVATIONS

Catalepsy	Body weight
Body temperature	

Testing was performed by the same technicians, whenever possible, who did not know the animal's group assignment. Although data were collected and statistically analyzed for each testing parameter (when necessary) the FOB data presented in this report only include functional domains that are significantly different from the control group and/or were affected by test article administration. Locomotor activity was monitored with the automated Kinder Scientific MotorMonitor System (Kinder Scientific, Poway, CA, USA). The test session was 60 minutes in duration, consisting of 6 subintervals lasting 10 minutes each. Locomotor activity was evaluated as total and ambulatory activity counts obtained over each subinterval (0-10 minutes, 11-20 minutes, 21-30 minutes, 31-40 minutes, 41-50 minutes and 51-60 minutes) and the entire 60-minute session.

3.5. STATISTICAL ANALYSIS

All analyses were two-tailed for minimum significance levels of 5% and 1%. All statistical tests were performed by a computer with appropriate programming as

referenced below. Total and ambulatory counts were analyzed, by sex and session, with a repeated measures analysis of variance (RANOVA). Factors in the model included treatment group (TRT), time interval (TIME), and the interaction of time interval and treatment group (TRT*TIME). The SAS® procedure PROC MIXED was used for analysis with the random effect of animal included as the repeated measurement. The covariance structure across time was selected by comparing Akaike's Information Criterion.

Continuous FOB data were subjected to parametric one-way analysis of variance (ANOVA) to determine intergroup differences (Snedecor, 1980). If significant differences were determined by the ANOVA, Dunnett's test (Dunnett, 1964) was used to compare each control group with the test article-treated groups. Functional Observational Battery parameters yielding scalar or descriptive data were analyzed by Fisher's Exact Test (Steel and Torrie, 1980).

The monotonic dose-response relationship was evaluated using sequential linear trend tests based on ordinal spacing of dose levels. The linear dose by time interaction was evaluated and, if significant at the 0.05 level, trend tests on treatment means were performed at the 0.05 level for each time interval.

Nonmonotonic dose responses were evaluated whenever no significant linear trends were detected, but TRT and/or TRT*TIME were significant at the 0.01 level. Within the framework of the RANOVA, pairwise comparisons were made for each individual test article-treated group with each control group through linear contrasts. If TRT*TIME was significant, the comparisons were conducted for each time interval. If only the TRT effect was significant, the comparisons were conducted across the pooled time intervals of the entire session. These nonmonotonic dose-response comparisons were conducted at the 0.01 significance level.

All statistical analyses for locomotor activity were conducted by BioSTAT Consultants, Inc., Portage, MI, USA, using Version 9.1 (SAS Institute, Inc., 2002-2003) software.

4. RESULTS AND DISCUSSION

The FOB performed prior to chlorpyrifos administration (pretest) showed no differences in handling, sensory, neuromuscular and physiological parameters. Increased urination (in the open field; $p<0.05$ or $p<0.01$, Table 4) by females assigned to the 20 mg/kg chlorpyrifos groups; as well as a longer time to first step by 20 mg/kg chlorpyrifos treated males ($p<0.01$), compared to control groups 1 or 2. However, approximately 3.5 hours following dose administration, chlorpyrifos-treated animals exhibited test article-related differences (compared to the control groups) in the home cage, open field, neuromuscular and physiological parameters, while handling and sensory parameters were largely unaffected. This was not considered to be test article related since the differences were not consistent between control groups 1 and 2.

4.1. HOME CAGE AND OPEN FIELD ASSESSMENTS

The first two components of the FOB, including home cage and open field assessments identified repetitive movement of the mouth and jaw (1 female each at 20 mg/kg and 100 mg/kg and 2 males at 100 mg/kg; Table 2) in the home cage, which is an expected effect of chlorpyrifos treatment. The open field observations during the FOB test identified a more robust test article-related effect with an increased time until the initiation of motor behavior, i.e., the first step taken, for both the 100 mg/kg group males and females (Table 4, $p<0.01$). This increased latency compared to both vehicle control group males and females, indicates that chlorpyrifos treatment prolonged the time to initiation of motor movement and inhibited motor function. This, along with the general decline in mean total and ambulatory activity, further suggests that chlorpyrifos impaired movement. Another aspect of motor movement, gait, was affected by chlorpyrifos administration (Table 4). The numbers of males and females with normal gait were decreased in the 100 mg/kg group (the difference was significant [$p<0.01$] for males compared to both control groups). Specifically, both sexes showed an increase in the incidence of hunched body posture; splayed or dragging hind limbs were also noted for 1 male, while 2 females were observed walking on tiptoes. These effects on gait are consistent with decreases in motor activity as well as the results of previous research regarding chlorpyrifos and motor behavior (Moser, 1995; Mattsson et al., 1996; Carr et al., 2001; Bushnell et al., 2001). In addition, there was a significant decrease in the

number of rears exhibited by chlorpyrifos treated females (100 mg/kg) compared to control group 1 (Table 4, $p<0.05$).

4.2. NEUROMUSCULAR ASSESSMENT

Neuromuscular impairment was particularly evident in males and females receiving the 100 mg/kg dose, where Rotarod performance (Table 6) was significantly decreased compared to both control groups ($p<0.05$ or $p<0.01$) and decreased compared to pretest; 1 male and 1 female in the 100 mg/kg group also exhibited slight tremors. This would indicate that there was impaired motor movement and/or balance. Since locomotor activity data also showed a decline in mean total and ambulatory activity, chlorpyrifos was indeed acting to impair motor function. In females, there was an apparent increase in forelimb grip strength (Table 6) at the 20 mg/kg dose ($p<0.05$); although not significant, this same group of females also had the greatest grip strength during the pretest evaluations (Table 5). The FOB data regarding impaired motor movement/balance and decreased activity are supported by published studies addressing neuromuscular impairments and chlorpyrifos (Moser 1995; Mattsson et al., 1996).

4.3. PHYSIOLOGICAL ASSESSMENT

Physiological parameters, specifically catalepsy and body temperature, were also affected by chlorpyrifos treatment in males and/or females (Table 8). Catalepsy time (the length of time spent motionless) was significantly increased in 100 mg/kg group males ($p<0.05$). The increased catalepsy time corresponds to the previously discussed impairments in the initiation and overall motor behaviors examined. Along with the increased catalepsy time, there were significantly decreased body temperatures ($p<0.01$) for males and females in the 100 mg/kg group. The results are consistent with similar doses used in published research, which also show increased catalepsy time and decreased body temperature (Moser 1995; Mattsson et al., 1996; Timofeeva and Gordon, 2002).

4.4. MOTOR ACTIVITY

The motor activity data over all 6 subintervals measured by the Kinder Scientific MotorMonitor System in the pretest male and female groups show that there was no difference in mean total and ambulatory activity prior to chlorpyrifos administration (Figure 1A and 2A). Examining the total and ambulatory activity during the

6 subintervals also shows no difference prior to chlorpyrifos treatment in pretest males and females (Figure 3A and B, Figure 4A and B). In addition, there was an habituation profile present for both males and females over the 6 subintervals prior to chlorpyrifos administration. These similarities were expected, as there was no test article administered.

There was a significant decrease ($p<0.01$ or $p<0.001$) in mean total and ambulatory activity counts compared to the vehicle control groups following delivery of 100 mg/kg chlorpyrifos to males and females and following delivery of 20 mg/kg chlorpyrifos to females (Figure 1B, Figure 2B) approximately 3.5 hours following chlorpyrifos delivery. With respect to the individual subintervals of total and ambulatory activity, there were similar decreases in activity following chlorpyrifos treatment over the first 2 subintervals (1-10 minutes and 11-20 minutes) in males at 100 mg/kg and females at 20 and 100 mg/kg (Figure 5A and B, Figure 6A and B). These decreases in activity also followed a dose-dependent profile with the highest level of chlorpyrifos (100 mg/kg) resulting in the lowest overall activity. Females appeared to be more sensitive to chlorpyrifos treatment, as both the low and high doses (20 and 100 mg/kg, respectively) resulted in decreased activity, similar to behavioral results observed in the FOB.

Because there were no differences in motor activity prior to chlorpyrifos administration, the decreased total and ambulatory activity can be attributed to chlorpyrifos. These decreases in motor activity are also consistent with the results of previous studies at similar dose levels of chlorpyrifos (Moser 1995; Mattsson et al., 1996; Carr et al., 2001; Bushnell et al., 2001).

5. CONCLUSION

In conclusion, the data generated using the functional observational battery and Kinder Scientific MotorMonitor System in male and female Sprague Dawley Crl:CD (SD) rats are consistent with the cited effects of chlorpyrifos on motor behavior. These procedures are therefore capable and sensitive enough to detect reductions in motor function with the positive control agent, chlorpyrifos, and can be considered to validate methodologies for OPPTS Guideline 870.6200 and OECD Guideline 424.

6. REFERENCES

Bushnell, P.J.; Moser, V.C.; Samsam, T.E. Comparing cognitive and screening tests for neurotoxicity: Effects of acute chlorpyrifos on visual signal detection and a neurobehavioral test battery in rats. *Neurotoxicology and Teratology* **2001**, *23*, 33-44.

Carr, R.L.; Chambers, H.W.; Guarisco, J.A.; Richardson, J.R.; Tang, J.; Chambers, J.E. Effects of repeated oral postnatal exposure to chlorpyrifos on open-field behavior in juvenile rats. *Toxicological Sciences* **2001**, *59*, 260-267.

Dunnett, C.W. New tables for multiple comparisons with a control. *Biometrics* **1964**, 20, 482-491.

Gad, S.C. A neuromuscular screen for use in industrial toxicology. *Journal of Toxicology and Environmental Health*. **1982**, *9*, 691-704.

Haggerty, G.C. Development of Tier I neurobehavioral testing capabilities for incorporation into pivotal rodent safety assessment studies. *Journal of American* College of Toxicology 1989, *8*, 53-69.

Irwin, S. Comprehensive observational assessment: Ia. A systematic quantitative procedure for assessing the behavioral physiological state of the mouse. *Psychopharmacologia* **1968**, *13*, 222-257.

Mattsson, J.L.; Wilmer J.W.; Shankar, M.R.; Berdasco, N.M.; Crissman, J.W.; Maurissen, J.P.; Bond D.M. (1996) Single-dose and 13-week repeated dose neurotoxicity screening studies of chlorpyrifos insecticide. *Food and Chemical Toxicology* **1996**, *34*, 393-405.

Moser, V.C.; McCormick, J.P.; Creason, J.P.; MacPhail, R.C. Comparison of , chlordimeform and carbaryl using a functional observational battery. *Fundamentals of Applied Toxicology* **1988**, *11*, 189-206.

Moser, V.C.; McDaniel, K.L.; Phillips, P.M. Rat strain and stock comparisons using a functional observational battery: Baseline values and effects of Amitraz Toxicology and Applied Pharmacology **1991**, *108*, 267-283.

Moser, V.C. Comparisons of the acute effects of cholinesterase inhibitors using a neurobehavioral screening battery in rats. Neurotoxicology and Teratology **1995**, *17*, 617-625.

O'Donoghue, J.L. Screening for neurotoxicity using a neurologically based examination and neuropathology. Journal of American College of Toxicology **1989**, *8*, 97-116.

SAS Institute, Inc. SAS® *Proprietary Software Release, Version 9.1,* SAS Institute, Inc.: Cary, NC, **2002-2003.**

Snedecor, G.W.; Cochran, W.G. One Way Classifications; Analysis of Variance. In *Statistical Methods,* 7th ed.; The Iowa State University Press: Ames, IA, **1980**, 215-237

Steel R.G.D; Torrie, J.H. Principles and Procedures of Statistics, A Biometrical Approach, Second Edition. McGraw-Hill Book Company, New York, NY, **1980**, pp. 471-472.

Timofeeva, O.A.; Gordon, C.G. EEG spectra, behavioral states and motor activity in rats exposed to acetylcholinesterase inhibitor chlorpyrifos. *Pharmacology Biochemistry and Behavior* **2002**, *72*, 669-679.

7. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Report Submitted By:

[redacted]

5 Sept. 2008
Date

Group Supervisor, Neurosciences
Study Director

Report Prepared By:

[redacted]

5 Sep 2008
Date

Staff Toxicologist, Neurosciences

Report Reviewed By:

[redacted]

5 Sep 2008
Date

Assistant Director, Neurosciences
Study Method Assessor

[redacted]

5 Sep 2008
Date

Project Specialist, Neurosciences

FIGURES 1-6

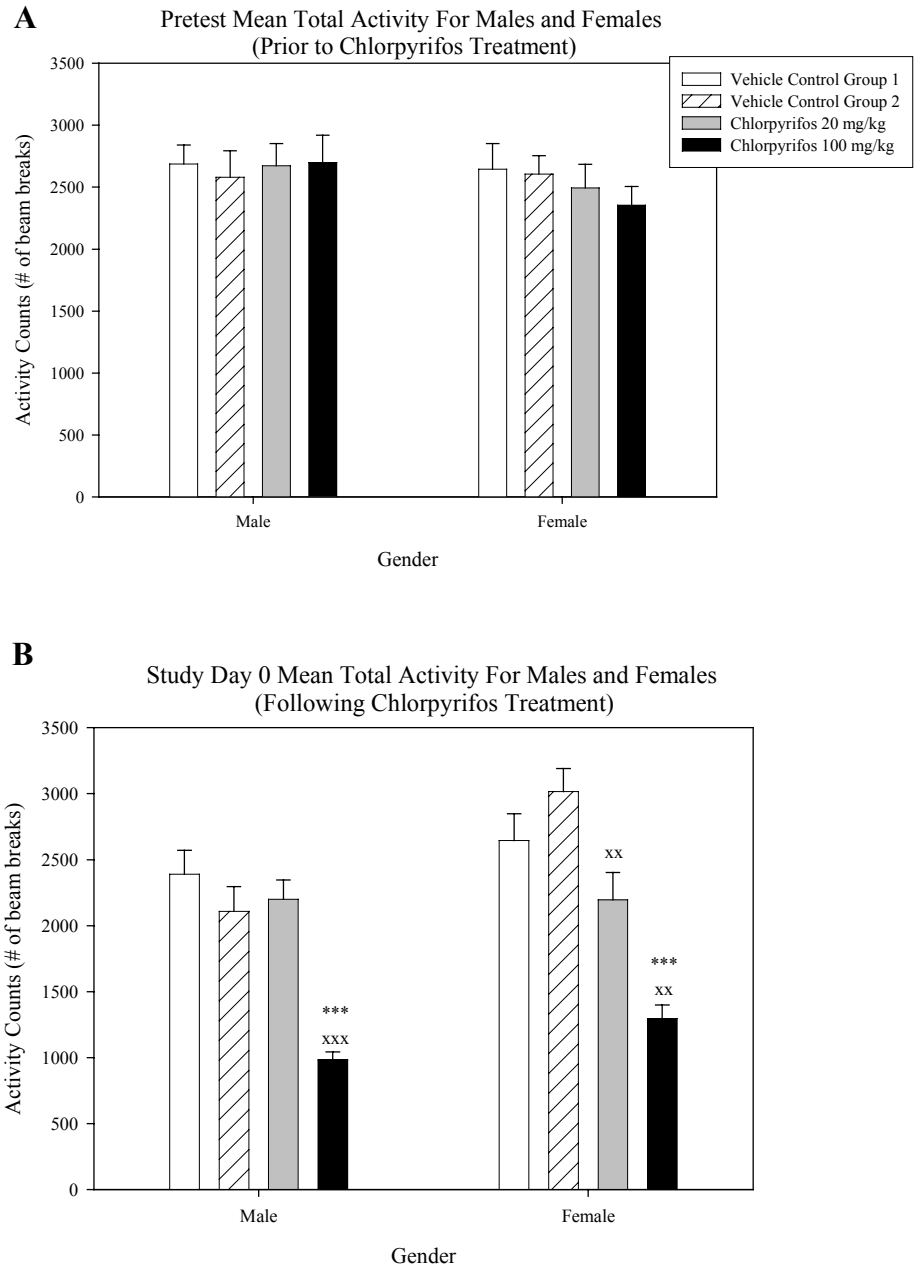


FIGURE 1. Mean total activity counts over all subintervals for (A) males and females at pretest and (B) males and females on Study Day 0, expressed as mean ± SEM. Significance between the treatment groups and vehicle control group 1 is indicated by $^{***}p<0.001$ and between the treatment and vehicle control group 2 is indicated by $^{xx}p<0.01$ and $^{xxx}p<0.001$.

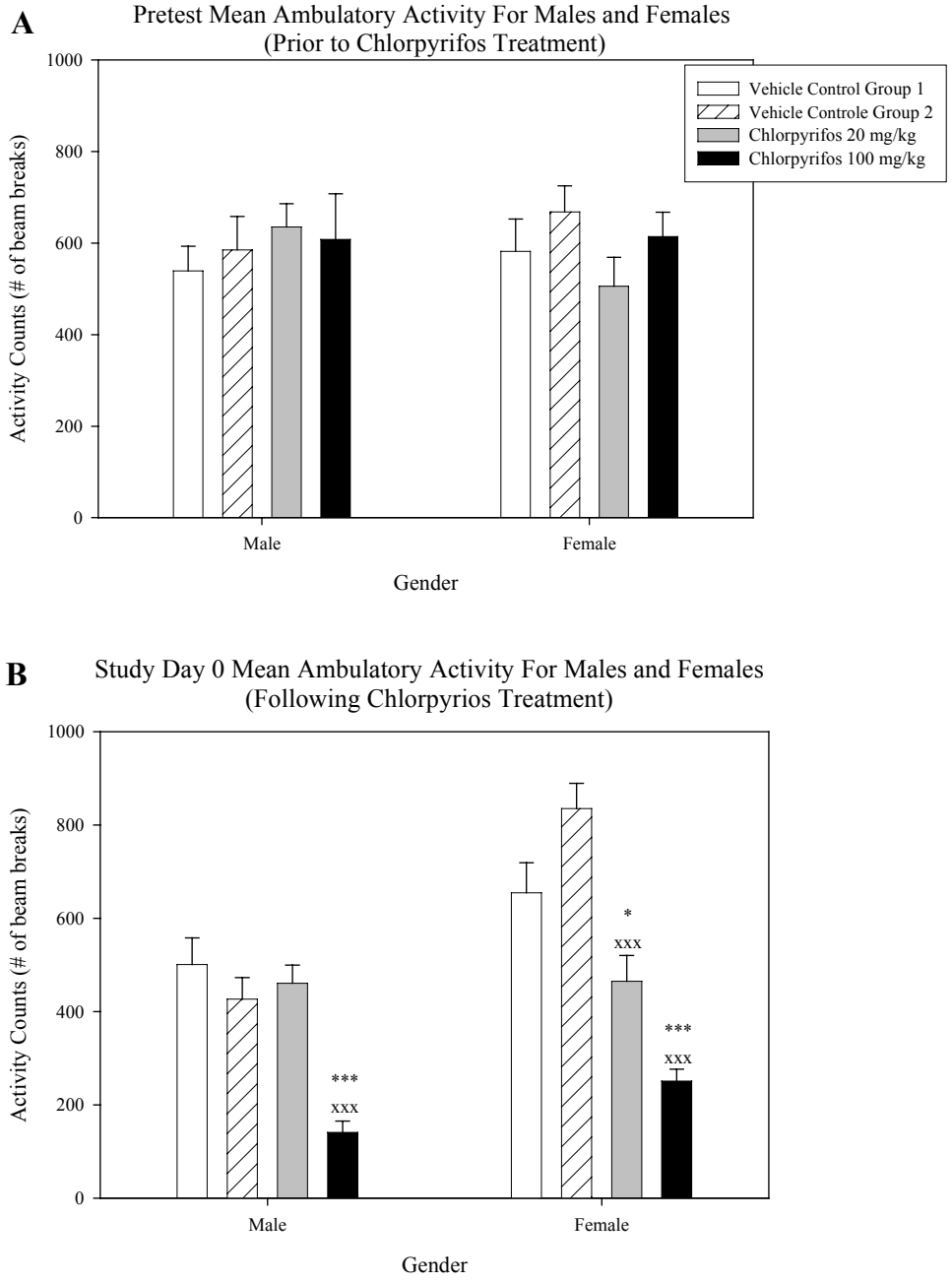


FIGURE 2. Mean ambulatory counts over all subintervals for (A) males and females and (B) males and females on Study Day 0, expressed as mean ± SEM. Significance between the treatment groups and vehicle control group 1 is indicated by $^{*}p<0.05$ and $^{***}p<0.001$ and between the treatment and vehicle control group 2 is indicated by $^{xxx}p<0.001$.

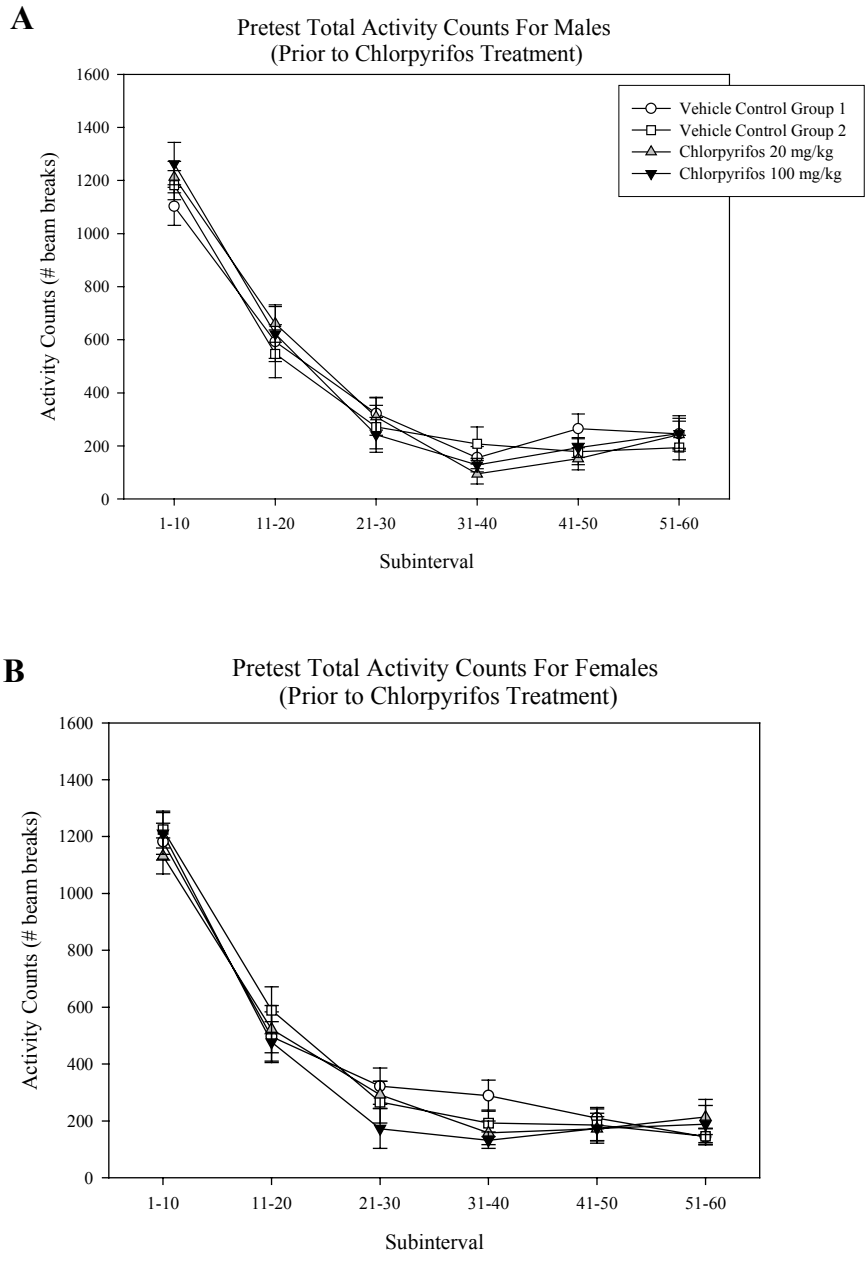


FIGURE 3. Total activity counts over each subinterval for (A) males at pretest and (B) pretest females at pretest, expressed as mean ± SEM

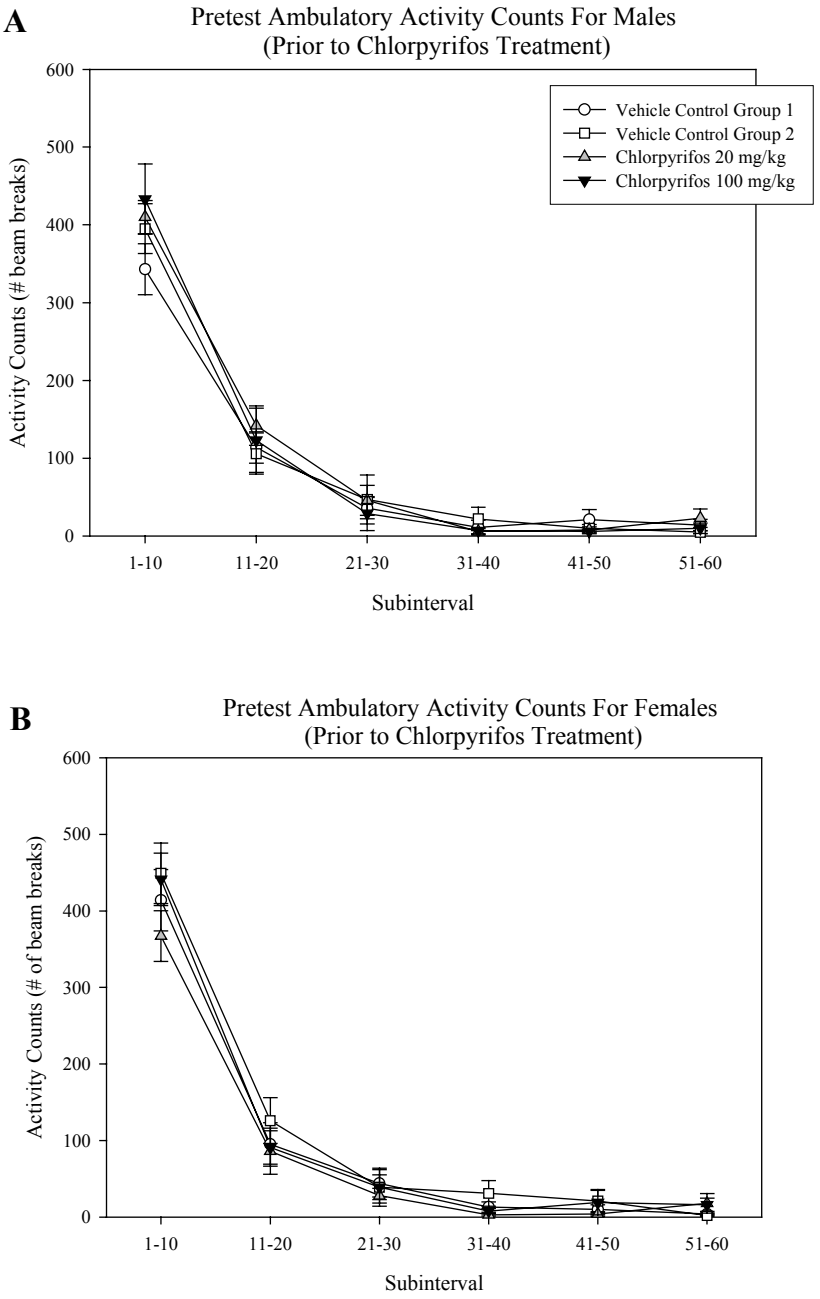


FIGURE 4. Total ambulatory activity counts over each subinterval for (A) males at pretest and (B) females at pretest, expressed as means ± SEM

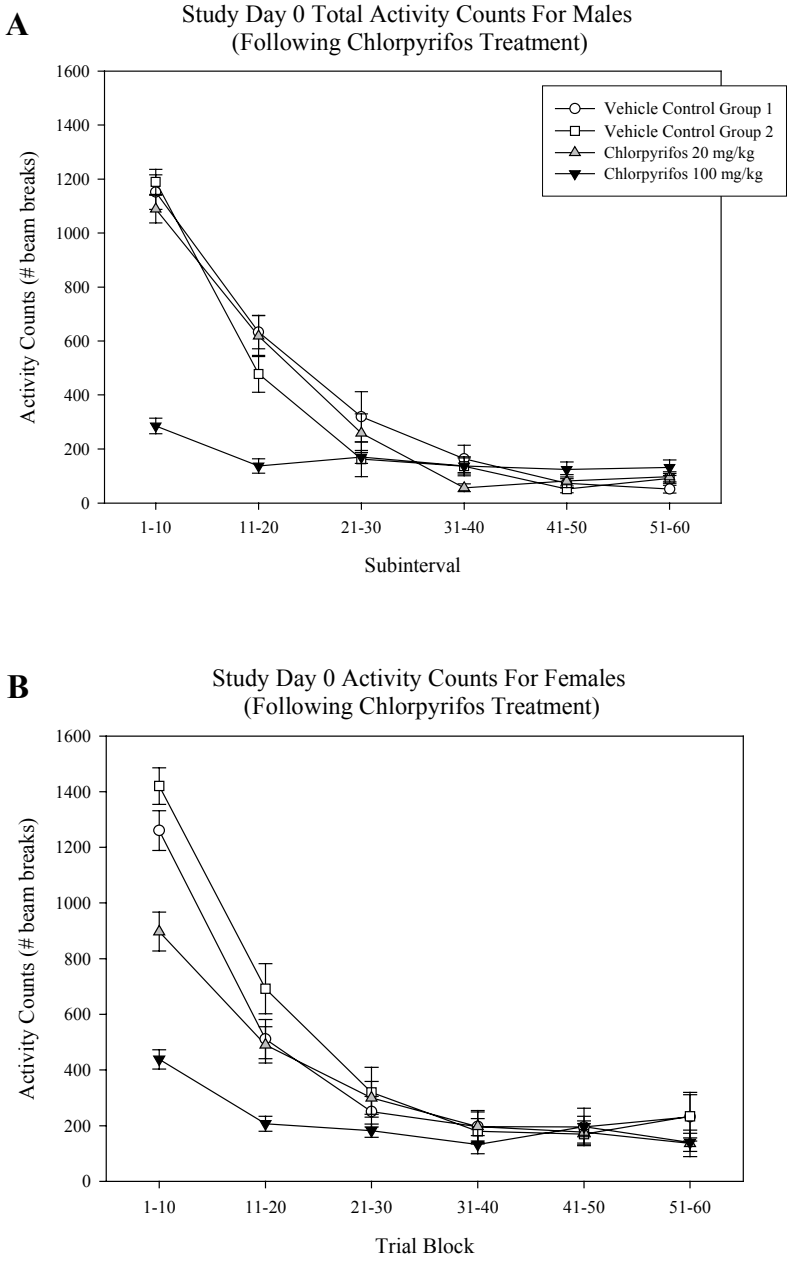


FIGURE 5. Total activity counts over each subinterval for (A) males on Study Day 0 and (B) females on Study Day 0, expressed as mean ± SEM

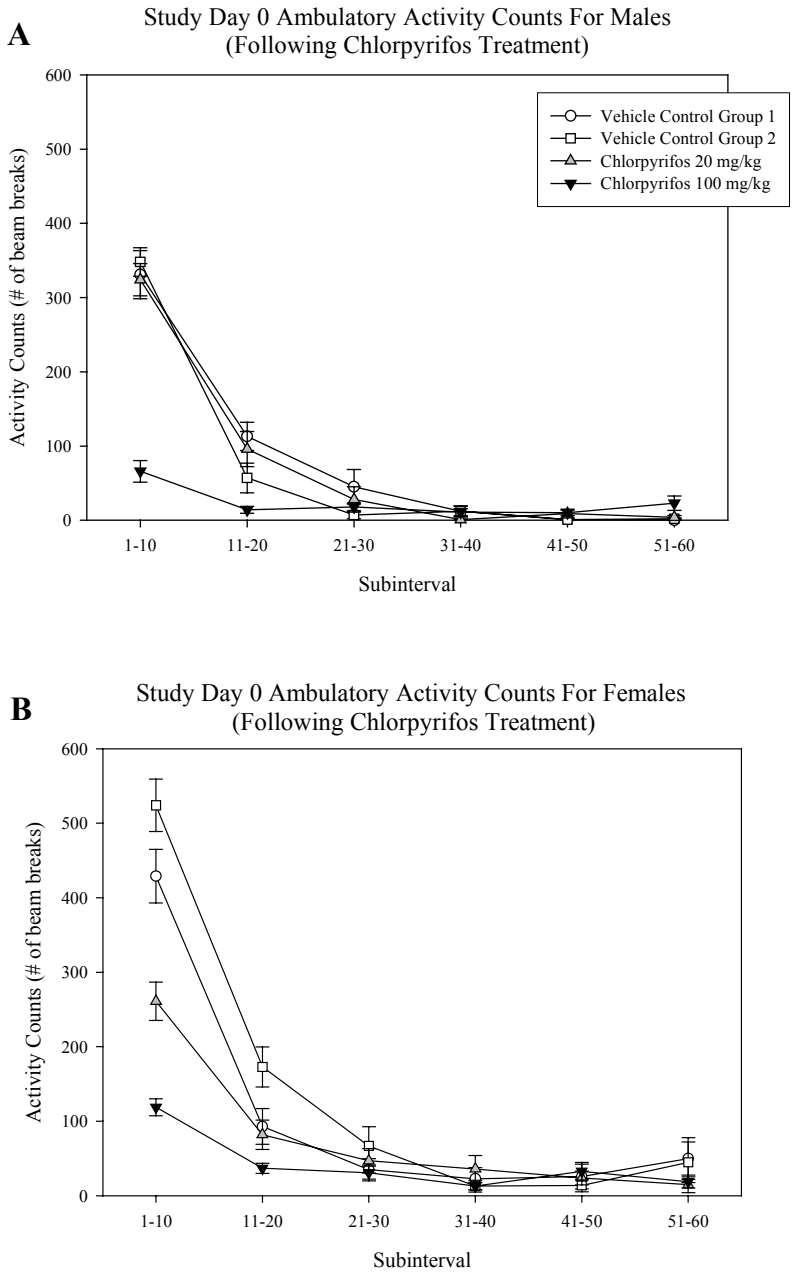


FIGURE 6. Total ambulatory activity counts over each subinterval for (A) males on Study Day 0 and (B) females on Study Day 0, expressed as mean ± SEM

FOB SUMMARY TABLES

TABLE 1 (HOME CAGE OBSERVATIONS - PRETEST EVALUATION)

PROJECT NO.:WIL-99443 | POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS | PAGE 1

SPONSOR:WIL RESEARCH | SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA | PRETEST

HOME CAGE OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	12	12	12	12
POSTURE				
SITTING OR STANDING NORMALLY	7	7	7	6
ASLEEP, LYING ON SIDE OR CURLED UP	5	5	5	6
CONVULSIONS - CLONIC				
ABSENT	12	12	12	12
CONVULSIONS - TONIC				
ABSENT	12	12	12	12
TREMORS				
NONE	12	12	12	12
BITING				
NONE	12	12	12	12
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	7	8	6	6
EYELIDS SLIGHTLY DROOPING	0	0	1	0
DROOPING EYELIDS (HALF-CLOSED)	1	0	1	0
EYELIDS COMPLETELY SHUT	4	4	4	6
FECES CONSISTENCY				
PELLETS	11	10	8	9
PELLETS ABSENT	1	2	4	3

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST

TABLE 1 (HOME CAGE OBSERVATIONS - PRETEST EVALUATION)
POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS
SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	12	12	12	12
POSTURE				
SITTING OR STANDING NORMALLY	5	6	5	7
ASLEEP, LYING ON SIDE OR CURLED UP	6	6	7	5
ALERT, ORIENTED TOWARD OBSERVER	1	0	0	0
CONVULSIONS - CLONIC				
ABSENT	12	12	12	12
CONVULSIONS - TONIC				
ABSENT	12	12	12	12
TREMORS				
NONE	12	12	12	12
BITING				
NONE	12	12	12	12
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	6	6	6	7
DROOPING EYELIDS (HALF-CLOSED)	0	0	1	1
EYELIDS COMPLETELY SHUT	6	6	5	4
FECES CONSISTENCY				
PELLETS	9	8	10	8
PELLETS ABSENT	3	4	2	4

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST

TABLE 2 (HOME CAGE OBSERVATIONS - DAY 0 EVALUATION)

PROJECT NO.:WIL-99443 | POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS | PAGE 1

SPONSOR:WIL RESEARCH | SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA | DAY 0

HOME CAGE OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	12	12	12	12
POSTURE				
SITTING OR STANDING NORMALLY	2	7	7	9a
ASLEEP, LYING ON SIDE OR CURLED UP	10	5	5	1b
SITTING, HEAD HELD LOW	0	0	0	2
CONVULSIONS - CLONIC				
ABSENT	12	12	12	10
REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	2
CONVULSIONS - TONIC				
ABSENT	12	12	12	12
TREMORS				
NONE	12	12	12	12
BITING				
NONE	12	12	12	12
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	2	8	7	10b
EYELIDS SLIGHTLY DROOPING	0	0	0	1
EYELIDS COMPLETELY SHUT	10	4	5	1b
FECES CONSISTENCY				
PELLETS	3	7	5	9a
PELLETS ABSENT	9	5	7	3a

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

a = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 USING FISHER'S EXACT TEST

b = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 USING FISHER'S EXACT TEST

c = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.05 USING FISHER'S EXACT TEST

HOME CAGE OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	12	12	12	12
POSTURE				
SITTING OR STANDING NORMALLY	4	8	8	11b
ASLEEP, LYING ON SIDE OR CURLED UP	8	4	3	1b
ALERT, ORIENTED TOWARD OBSERVER	0	0	1	0
CONVULSIONS - CLONIC				
ABSENT	12	12	11	11
REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	1	1
CONVULSIONS - TONIC				
ABSENT	12	12	12	12
TREMORS				
NONE	12	12	12	12
BITING				
NONE	12	12	12	11
BITING OF SELF	0	0	0	1
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	4	8	9	10a
EYELIDS SLIGHTLY DROOPING	1	0	0	1
DROOPING EYELIDS (HALF-CLOSED)	1	0	1	0
EYELIDS COMPLETELY SHUT	6	4	2	1
FECES CONSISTENCY				
PELLETS	6	5	5	7
PELLETS ABSENT	6	7	7	5

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
a = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 USING FISHER'S EXACT TEST
b = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 USING FISHER'S EXACT TEST

PFOBSUv4.29
05/15/2008
R:07/25/2008

TABLE 3 (OPEN FIELD OBSERVATIONS - PRETEST EVALUATION)

PROJECT NO.:WIL-99443 | POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS | PAGE 1

SPONSOR:WIL RESEARCH | SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA | PRETEST

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
TIME TO FIRST STEP (seconds)	: MEAN	0.4	0.4	0.6g	0.5
	S.D.	0.14	0.09	0.40	0.14
MOBILITY					
NORMAL		12	12	12	12
GAIT					
NORMAL		12	12	12	12
CONVULSIONS - CLONIC					
ABSENT		12	12	12	12
CONVULSIONS - TONIC					
ABSENT		12	12	12	12
TREMORS					
NONE		12	12	12	12
GAIT SCORE					
NORMAL		12	12	12	12
AROUSAL					
NORMAL: ALERT, EXPLORATORY MOVEMENTS		12	12	12	12
BIZARRE/STEREOTYPIC BEHAVIOR					
NONE		12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

g = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.05 USING DUNNETT'S TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST

TABLE 3 (OPEN FIELD OBSERVATIONS - PRETEST EVALUATION)
POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS
SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
REARING	: MEAN	5.1	4.4	4.7	6.5
	S.D.	2.64	2.50	2.50	2.20
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.3	0.3	0.1	0.5
	S.D.	0.65	0.45	0.29	0.80
URINATION	: MEAN	0.7	0.3	0.5	0.6
	S.D.	0.65	0.49	0.52	0.67
DEFECATION	: MEAN	0.3	0.3	0.3	0.7
	S.D.	0.89	0.49	0.62	1.37

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 3 (OPEN FIELD OBSERVATIONS - PRETEST EVALUATION)

PROJECT NO.:WIL-99443 | POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS | PAGE 3

SPONSOR:WIL RESEARCH | SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA | PRETEST

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
TIME TO FIRST STEP (seconds)	: MEAN	0.5	0.5	0.4	0.4
	S.D.	0.26	0.14	0.14	0.20
MOBILITY					
NORMAL		12	12	12	12
GAIT					
NORMAL		12	12	12	12
CONVULSIONS - CLONIC					
ABSENT		12	12	12	12
CONVULSIONS - TONIC					
ABSENT		12	12	12	12
TREMORS					
NONE		12	12	12	12
GAIT SCORE					
NORMAL		12	12	12	12
AROUSAL					
NORMAL: ALERT, EXPLORATORY MOVEMENTS		12	12	12	12
BIZARRE/STEREOTYPIC BEHAVIOR					
NONE		12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 3 (OPEN FIELD OBSERVATIONS - PRETEST EVALUATION)
POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS
SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
REARING	: MEAN	6.2	7.5	5.9	6.6
	S.D.	3.24	3.61	2.15	3.70
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.2	0.1	0.3	0.3
	S.D.	0.39	0.29	0.62	0.87
URINATION	: MEAN	0.2	0.1	0.8eh	0.2
	S.D.	0.39	0.29	0.62	0.39
DEFECATION	: MEAN	0.2	0.0	0.2	0.0
	S.D.	0.39	0.00	0.39	0.00

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
e = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 USING DUNNETT'S TEST
h = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST

PFOBSUv4.29
05/15/2008
R:05/15/2008

TABLE 4 (OPEN FIELD OBSERVATIONS - DAY 0 EVALUATION)

PROJECT NO.:WIL-99443 | POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS | PAGE 1

SPONSOR:WIL RESEARCH | SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA | DAY 0

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
TIME TO FIRST STEP (seconds)	: MEAN	0.5	0.5	0.6	1.7fh
	S.D.	0.13	0.21	0.11	1.17
MOBILITY					
NORMAL		12	12	12	12
GAIT					
NORMAL		12	12	12	5bd
HINDLIMBS SPLAYED OR DRAGGING, UNABLE TO SUPPORT WEIGHT		0	0	0	1
HUNCHED BODY		0	0	0	7bd
CONVULSIONS - CLONIC					
ABSENT		12	12	12	12
CONVULSIONS - TONIC					
ABSENT		12	12	12	12
TREMORS					
NONE		12	12	12	11
SLIGHT (1.5mm)		0	0	0	1
GAIT SCORE					
NORMAL		12	12	12	12
AROUSAL					
NORMAL: ALERT, EXPLORATORY MOVEMENTS		12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
b = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 USING FISHER'S EXACT TEST
d = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING FISHER'S EXACT TEST
f = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 USING DUNNETT'S TEST
h = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
BIZARRE/STEREOTYPIC BEHAVIOR					
NONE		12	12	12	12
REARING	: MEAN	1.6	1.5	1.4	1.1
	S.D.	2.61	1.88	1.44	1.44
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.3	0.2	0.0	0.3
	S.D.	0.65	0.39	0.00	0.45
URINATION	: MEAN	0.4	0.0	0.5	0.4
	S.D.	0.67	0.00	0.80	0.51
DEFECATION	: MEAN	0.8	1.3	1.0	0.1
	S.D.	0.83	1.91	1.48	0.29

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
TIME TO FIRST STEP (seconds)	: MEAN	0.5	0.5	0.5	0.9fh
	S.D.	0.12	0.11	0.08	0.59
MOBILITY					
NORMAL		12	12	12	12
GAIT					
NORMAL		12	11	10	8
WALKS ON TIPTOES		0	1	0	2
HUNCHED BODY		0	1	2	4
CONVULSIONS - CLONIC					
ABSENT		12	12	12	12
CONVULSIONS - TONIC					
ABSENT		12	12	12	12
TREMORS					
NONE		12	12	12	11
SLIGHT (1.5mm)		0	0	0	1
GAIT SCORE					
NORMAL		12	12	12	12
AROUSAL					
NORMAL: ALERT, EXPLORATORY MOVEMENTS		12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
f = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 USING DUNNETT'S TEST
h = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST

TABLE 4 (OPEN FIELD OBSERVATIONS - DAY 0 EVALUATION)
POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS
SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
BIZARRE/STEREOTYPIC BEHAVIOR					
NONE		12	12	12	12
REARING	: MEAN	3.2	3.8	1.9	1.7g
	S.D.	2.98	3.35	1.31	1.50
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.1	0.0	0.0	0.4
	S.D.	0.29	0.00	0.00	0.90
URINATION	: MEAN	0.1	0.3	0.6	0.1
	S.D.	0.29	0.62	0.90	0.29
DEFECATION	: MEAN	0.3	0.2	0.3	0.3
	S.D.	1.15	0.58	0.65	0.87

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST
g = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.05 USING DUNNETT'S TEST

PFOBSUv4.29
05/15/2008
R:05/15/2008

TABLE 5 (NEUROMUSCULAR OBSERVATIONS - PRETEST EVALUATION)

PROJECT NO.:WIL-99443 — POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS — PAGE 1

SPONSOR:WIL RESEARCH — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

NEUROMUSCULAR OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
HINDLIMB EXTENSOR STRENGTH HINDLIMB RESISTANCE PRESENT		12	12	12	12
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE: MEAN	384.7	418.1	423.9	422.3
	S.D.	66.82	87.88	80.50	42.51
	HIND: MEAN	182.7	190.8	207.3	182.2
	S.D.	33.98	51.73	61.44	46.11
ROTAROD PERFORMANCE (seconds)	: MEAN	60.9	91.4	100.5	83.0
	S.D.	44.42	38.59	38.60	43.89
HINDLIMB FOOTSPLAY (mm)	: MEAN	54.5	58.6	58.5	61.8
	S.D.	13.79	10.00	15.99	12.04

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 5 (NEUROMUSCULAR OBSERVATIONS - PRETEST EVALUATION)

PROJECT NO.:WIL-99443 — POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS — PAGE 2

SPONSOR:WIL RESEARCH — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

NEUROMUSCULAR OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
HINDLIMB EXTENSOR STRENGTH HINDLIMB RESISTANCE PRESENT		12	12	12	12
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE: MEAN	382.8	391.8	405.9	383.2
	S.D.	55.42	63.42	71.51	88.78
	HIND: MEAN	181.9	196.9	200.7	185.6
	S.D.	46.04	59.21	57.78	45.55
ROTAROD PERFORMANCE (seconds)	: MEAN	92.8	89.0	81.6	84.1
	S.D.	38.53	45.94	42.50	39.89
HINDLIMB FOOTSPLAY (mm)	: MEAN	55.5	57.6	56.3	61.1
	S.D.	9.62	19.84	10.42	12.03

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING FISHER'S EXACT TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

PFOBSUv4.29
05/15/2008
R:05/15/2008

TABLE 6 (NEUROMUSCULAR OBSERVATIONS - DAY 0 EVALUATION)

PROJECT NO.:WIL-99443 — POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS — PAGE 1

SPONSOR:WIL RESEARCH — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 0

NEUROMUSCULAR OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
HINDLIMB EXTENSOR STRENGTH					
REDUCED HINDLIMB RESISTANCE, ANIMAL SHOWS SOME WEAKNESS		0	1	0	4
HINDLIMB RESISTANCE PRESENT		12	11	12	8
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE: MEAN	506.5	532.1	552.8	661.3e
	S.D.	123.84	175.17	170.47	88.68
	HIND: MEAN	317.7	308.8	298.7	336.4
	S.D.	100.42	98.90	67.93	77.86
ROTAROD PERFORMANCE (seconds)	: MEAN	87.0	120.0	98.7	41.7eh
	S.D.	45.07	0.00	34.62	41.13
HINDLIMB FOOTSPLAY (mm)	: MEAN	55.1	62.2	56.9	48.6
	S.D.	10.47	10.99	14.61	15.29

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

e = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 USING DUNNETT'S TEST

h = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST

NONE SIGNIFICANTLY DIFFERENT FROM CONTROLS USING FISHER'S EXACT TEST

NEUROMUSCULAR OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
HINDLIMB EXTENSOR STRENGTH					
REDUCED HINDLIMB RESISTANCE, ANIMAL SHOWS SOME WEAKNESS		0	0	0	3
HINDLIMB RESISTANCE PRESENT		12	12	12	9
GRIP STRENGTH (g) - FORE/HINDLIMB	FORE: MEAN	512.2	591.8	622.8e	537.8
	S.D.	96.35	85.27	118.23	108.67
	HIND: MEAN	308.6	343.7	306.3	307.3
	S.D.	107.05	101.68	80.22	49.45
ROTAROD PERFORMANCE (seconds)	: MEAN	103.7	113.0	102.3	71.7h
	S.D.	38.61	20.76	34.06	37.23
HINDLIMB FOOTSPLAY (mm)	: MEAN	54.8	59.8	51.2	47.0
	S.D.	9.11	19.99	11.95	16.91

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG
e = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 USING DUNNETT'S TEST
h = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST
NONE SIGNIFICANTLY DIFFERENT FROM CONTROLS USING FISHER'S EXACT TEST

PFOBSUv4.29
05/15/2008
R:05/15/2008

TABLE 7 (PHYSIOLOGICAL OBSERVATIONS - PRETEST EVALUATION)

PROJECT NO.:WIL-99443 — POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS — PAGE 1

SPONSOR:WIL RESEARCH — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

PHYSIOLOGICAL OBSERVATIONS
MALES

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
CATALEPSY (seconds)	: MEAN	0.2	0.2	0.2	0.2
	S.D.	0.00	0.00	0.00	0.00
	N	12	12	12	12
BODY TEMPERATURE (degrees C)	: MEAN	37.8	38.0	37.9	38.0
	S.D.	0.26	0.30	0.27	0.33
	N	12	12	12	12
BODY WEIGHT (g)	: MEAN	135.3	135.8	136.0	135.5
	S.D.	29.86	26.22	25.83	20.26
	N	12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 7 (PHYSIOLOGICAL OBSERVATIONS - PRETEST EVALUATION)

PROJECT NO.:WIL-99443 — POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS — PAGE 2

SPONSOR:WIL RESEARCH — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — PRETEST

PHYSIOLOGICAL OBSERVATIONS
FEMALES

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
CATALEPSY (seconds)	: MEAN	0.2	0.2	0.2	0.2
	S.D.	0.03	0.00	0.00	0.00
	N	12	12	12	12
BODY TEMPERATURE (degrees C)	: MEAN	37.9	37.9	37.8	37.9
	S.D.	0.34	0.31	0.32	0.20
	N	12	12	12	12
BODY WEIGHT (g)	: MEAN	118.2	114.5	113.7	115.8
	S.D.	16.19	12.50	13.12	10.17
	N	12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

PFOBSUv4.29
05/15/2008
R:05/15/2008

TABLE 8 (PHYSIOLOGICAL OBSERVATIONS - DAY 0 EVALUATION)

PROJECT NO.:WIL-99443 — POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS — PAGE 1

SPONSOR:WIL RESEARCH — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 0

PHYSIOLOGICAL OBSERVATIONS
MALES

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
CATALEPSY (seconds)	: MEAN	0.5	0.5	0.5	1.7eg
	S.D.	0.21	0.16	0.17	2.01
	N	12	12	12	12
BODY TEMPERATURE (degrees C)	: MEAN	37.7	37.7	37.5	35.1fh
	S.D.	0.67	0.80	0.93	1.03
	N	12	12	12	12
BODY WEIGHT (g)	: MEAN	204.9	203.0	203.6	200.2
	S.D.	31.80	28.79	26.93	26.38
	N	12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

e = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 USING DUNNETT'S TEST
f = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST
g = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.05 USING DUNNETT'S TEST
h = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST

TABLE 8 (PHYSIOLOGICAL OBSERVATIONS - DAY 0 EVALUATION)

PROJECT NO.:WIL-99443 — POSITIVE CONTROL NT STUDY IN RATS USING CHLORPYRIFOS — PAGE 2

SPONSOR:WIL RESEARCH — SUMMARY OF FUNCTIONAL OBSERVATIONAL BATTERY DATA — DAY 0

PHYSIOLOGICAL OBSERVATIONS
FEMALES

GROUP:		1	2	3	4
NUMBER TESTED:		12	12	12	12
CATALEPSY (seconds)	: MEAN	0.5	0.5	0.6	0.7
	S.D.	0.22	0.17	0.41	0.62
	N	12	12	12	12
BODY TEMPERATURE (degrees C)	: MEAN	37.6	37.8	37.1	35.8fh
	S.D.	0.93	0.90	1.10	1.02
	N	12	12	12	12
BODY WEIGHT (g)	: MEAN	157.4	152.6	149.9	150.2
	S.D.	13.69	12.05	14.09	9.68
	N	12	12	12	12

1- 0 MG/KG 2- 0 MG/KG 3- 20 MG/KG 4- 100 MG/KG

f = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST

h = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 2 AT 0.01 USING DUNNETT'S TEST

PFOBSUv4.29
05/15/2008
R:05/15/2008

WIL-99263

AN INTER-OBSERVER RELIABILITY STUDY OF TECHNICIANS ASSIGNED TO PERFORM FUNCTIONAL OBSERVATIONAL BATTERY ASSESSMENTS IN RATS

Study Date Range: December 14, 2001 - October 9, 2002

STUDY OBJECTIVE:

The objective of this study was to train personnel to conduct the Functional Observational Battery (FOB) and to assess inter-observer reliability of the same technicians. FOB. inter-observer reliability studies serve as training for new employees, as well as on-going training for current employees.

CONTROL ARTICLES:

Deionized water was used as the negative control article. Two positive control articles, 3,3´-Iminodipropionitrile (IDPN) and Parathion, were used to elicit behavioral changes in the animals. IDPN was administered orally at 2000 mg/kg, and Parathion was administered orally at 4 mg/kg. All control articles were administered as a single dose.

TEST SYSTEM:

All animals used on the study were female Sprague-Dawley Crl:CD® (SD)IGS BR rats obtained from the WIL Research Laboratories, Inc. stock colony. Animals were randomly assigned to treatment groups using a computer program. The study was conducted according the protocol and WIL standard operating procedures.

ENVIRONMENTAL CONDITIONS:

The animals were housed and maintained under conditions consistent with maintaining good health. Temperature and relative humidity were set to maintain at 71 ± 5° C and 30-70%, respectively, in a room with a 12 hour light (6 a.m. to 6 p.m.)/dark photoperiod. Temperature and relative humidity were recorded once daily. The facilities at WIL Research Laboratories, Inc. are fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International).

VIABILITY OBSERVATIONS:

The rats were observed for mortality/moribundity and general condition twice daily, in the morning and in the afternoon.

BODY WEIGHTS:

Body weights were recorded on days of dosing for calculation of doses only.

FUNCTIONAL OBSERVATIONAL BATTERY ASSESSMENTS:

The Functional Observational Battery used at WIL Research Laboratories, Inc. is based on previously developed protocols (Moser et al., 1991; Irwin, 1968; Gad, 1982; Moser et al., 1988; Haggerty, 1989; O'Donoghue, 1989). Testing for Phase III (described below) was performed by trained technicians who did not know the animal's group assignment. The time of testing was determined by the Study Director based on the appearance of the expected behavioral signs following dosing. Animals were observed for the following parameters as described below (see WIL standard operating procedure No. T1-112, as revised, for a description of scoring criteria):

HOME CAGE OBSERVATIONS:

Posture
Convulsions/Tremors
Feces consistency
Biting
Palpebral (eyelid) closure

HANDLING OBSERVATIONS:

Ease of removal from cage
Lacrimation/chromodacryorrhea
Piloerection
Palpebral closure
Red/crusty deposits
Eye prominence
Ease of handling animal in hand
Salivation
Fur appearance
Respiratory rate/character
Mucous membranes/eye/skin color
Muscle tone

OPEN FIELD OBSERVATIONS: (evaluated over a 2-minute observation period)

Mobility
Rearing
Convulsions/tremors
Grooming
Bizarre/stereotypic behavior
Time to first step (seconds)
Gait
Arousal
Urination/defecation
Gait score
Backing

SENSORY OBSERVATIONS:

Approach response
Startle response
Pupil response
Forelimb extension
Air righting reflex
Touch response
Tail pinch
Eyeblink response
Hindlimb extension
Olfactory orientation

The study design consisted of three distinct phases to ensure the most adequate training and reliability among the technicians. Phases were designed as a progression to allow for

training and discussion prior to the final phase, which evaluated the inter-observer reliability. The phases of testing are described as follows:

PHASE I:

Phase I testing consisted of FOB assessments on naive stock animals. Each technician observed up to 60 rats through the entire FOB assessment. The purpose of Phase I testing was to ensure consistent and accurate use of all equipment and to gain a strong knowledge of the stereotypic behavior of naive animals. All rats used in Phase I testing were returned to stock following FOB assessments.

PHASE II:

Phase II testing consisted of an open discussion of each animal's observations conducted in a group setting. Two animals per group were dosed with Parathion, IDPN or deionized water and evaluated by the observers once the effects were apparent. Phase II allowed for open discussion of observations and interpretation of the findings. All animals used in Phase II testing were euthanized by carbon dioxide inhalation and carcasses discarded following testing.

PHASE III:

Phase III testing consisted of three animals per group dosed with a single dose of Parathion, IDPN or deionized water and observed at a time determined by the Study Director. Each technician individually recorded observations for each animal to evaluate the inter-observer reliability. All animals used in Phase III testing were euthanized by carbon dioxide inhalation and carcasses discarded following testing.

CRITERIA FOR EVALUATION OF TECHNICIANS:

The following criteria were used to evaluate the ability of technicians to reliably distinguish signs of neurotoxicity.

1. No omission of findings within the categories of Home Cage Observations, Handling Observations, Open Field Observations and Sensory Observations.

2. A difference of no more than two grades (severity) for a given finding in each category.

RESULTS:

VIABILITY:

All animals survived until scheduled euthanasia.

FUNCTIONAL OBSERVATIONAL BATTERY ASSESSMENTS:

Technicians were consistent in the findings reported when deionized water, IDPN or Parathion was administered (Table 1). There were no obvious or gross inconsistencies among the calls.

It was determined that the previously established criteria for evaluation were fulfilled to a degree deemed acceptable by the Study Director. It should be noted that there were a few apparent omissions of findings (Table 2) which upon further review were found to be of no practical significance.

CONCLUSIONS:

It was determined that the technicians fulfilled the criteria for reliably observing FOB parameters to assess behavioral changes in rats in a manner consistent with good science and WIL Research Laboratories, Inc. standard operating procedures.

REFERENCES:

Gad, S.C. A neuromuscular screen for use in industrial toxicology. *Journal of Toxicology and Environmental Health* **1982,** *9(5-6),* 691-704.

Haggerty, G.C. Development of tier I neurobehavioral testing capabilities for incorporation into pivotal rodent safety assessment studies. *Journal of the American College of Toxicology* **1989,** *8(1),* 53-69.

Irwin, S. Comprehensive observational assessment: Ia. a systematic, quantitative procedure for assessing the behavioral and physiologic state of the mouse. *Psychopharmacologia* **1968,** *13,* 222-257.

Moser, V.C.; McCormick, J.P.; Creason, J.P.; MacPhail, R.C. Comparison of chlordimeform and carbaryl using a functional observational battery. *Fundamentals of Applied Toxicology* **1988,** *11(2),* 189-206.

Moser, V.C.; McDaniel, K.L.; Phillips, P.M. Rat strain and stock comparisons using a functional observational battery: baseline values and effects of amitraz. *Toxicology and Applied Pharmacology* **1991,** *108(2),* 267-283.

O'Donoghue, J.L. (1989) Screening for neurotoxicity using a neurologically based examination and neuropathology. *J. Amer. Coll. Toxicol.* 8:97-116.

TABLE 1
FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
POSTURE												
1 - SITTING OR STANDING NORMALLY	1	2	1	2					3	2	3	2
2 - ASLEEP, LYING ON SIDE OR CURLED UP	2	1	2	1	3	3	3	3				
3 - ALERT, ORIENTED TOWARD OBSERVER										1		1
4 - SITTING, HEAD HELD LOW												
5 - FLATTENED, LIMBS MAY BE EXTENDED												
6 - LYING ON SIDE, LIMBS IN AIR												
7 - IMMOBILE												
8 - REARING												
9 - SPLAYED HINDLEGS												
10 - PROSTRATION												
CONVULSIONS - CLONIC												
1 - ABSENT	3	3	3	3	3	3	3	3	2	3	3	3
2 - TWITCHES (BACK MUSCLES)												
3 - IRREGULAR JERKING MOVEMENTS OF THE LIMBS												
4 - CLONIC WHOLE-BODY CONVULSIONS												
5 - HEAD AND/OR BODY TWITCHES (MYOCLONUS)												
6 - MUSCLE FASICULATIONS												
7 - REPETITIVE MOVEMENT OF MOUTH AND JAWS (CHEWING)												
CONVULSIONS - TONIC												
1 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
2 - TONIC: CONTRACTION OF EXTENSORS SUCH THAT LIMBS ARE RIGID AND EXTENDED												
3 - OPISTHOTONUS: HEAD, BODY AND LIMBS RIGIDLY ARCHED BACKWARDS												
4 - EMPROSTHOTONUS: HEAD, BODY AND LIMBS EXTENDED FORWARD												
5 - 'POPCORN SEIZURE': ANIMAL REPEATEDLY JUMPS OR BOUNCES IN AIR												
6 - ASPHYXIAL: BOUTS OF SEVERE CLONIC-TONIC CONVULSIONS												
TREMORS												
1 - NONE	3	3	3	3	3	3	3	3	3	3	3	3
2 - SLIGHT (1.5mm)												
3 - MODERATELY COARSE (3 mm)												
4 - MARKEDLY COARSE (4.5mm)												
5 - EXTREMELY COARSE (6 mm)												

Counts indicate the number of animals observed with a particular finding.

TABLE 1
FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
BITING												
1 - NONE	3	3	3	3	3	3	3	3	3	2	3	3
2 - BITING OF CAGE												
3 - BITING OF SELF												
PALPEBRAL CLOSURE												
1 - EYELIDS WIDE OPEN	1	2	1	2					2	3	3	3
2 - EYELIDS SLIGHTLY DROOPING									1			
3 - DROOPING EYELIDS (HALF-CLOSED)												
4 - EYELIDS COMPLETELY SHUT	2	1	2	1	3	3	3	3				
FECES CONSISTENCY												
1 - PELLETS									2	2	2	2
2 - PELLETS, PARTIALLY FORMED									1	1	1	1
3 - UNFORMED, DIARRHEA												
4 - PELLETS ABSENT	3	3	3	3	3	3	3	3				
EASE OF REMOVAL												
1 - VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP									2	2	2	1
2 - EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	3	3	3	3	2	2	2	1				1
3 - MODERATELY DIFFICULT: ANIMAL REARS, OFTEN FOLLOWING THE INVESTIGATOR'S HAND					1	1	1	1	1	1	1	1
4 - FREEZES: WITH/WITHOUT VOCALIZATION												
5 - DIFFICULT: RUNS AROUND CAGE, IS HARD TO GRAB, WITH/WITHOUT VOCALIZATION												
6 - VERY DIFFICULT: TAIL AND THROAT RATTLES WITH/WITHOUT VOCALIZATION; MAY ATTACK												
EASE OF HANDLING IN HAND												
1 - LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	2	1	2	1					1	1		1
2 - MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	1	2	1	2	2	2	2	2	2	2	3	2
3 - MODERATELY HIGH: MAY FREEZE, BE TENSE OR RIGID, WITH/WITHOUT VOCALIZATION					1	1	1	1				
4 - HIGH: SQUIRMS, TWISTS, ATTEMPTS TO BITE, WITH/WITHOUT VOCALIZATION												
LACRIMATION												
1 - NONE	3	3	3	3	2	2	2	2	3	3	3	3
2 - SLIGHT					1	1	1	1				
3 - SEVERE												
CHROMODACRYORRHEA												
1 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
2 - PRESENT												

Counts indicate the number of animals observed with a particular finding.

TABLE 1
FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
SALIVATION												
1 - NONE	3	3	3	3	3	3	3	3	3	3	3	3
2 - SLIGHT												
3 - SEVERE												
PILOERECTION												
1 - NONE	3	3	3	3	3	3	3	3	3	3	3	3
2 - SLIGHT												
3 - SEVERE												
FUR APPEARANCE												
1 - NORMAL: CLEAN AND GROOMED	3	3	3	3	3	3	3	3	2	2	2	2
2 - SLIGHTLY SOILED									1	1	1	1
3 - VERY SOILED, CRUSTY												
PALPEBRAL CLOSURE												
1 - EYELIDS WIDE OPEN	3	3	3	3	2	2	2	2	3	3	3	3
2 - EYELIDS SLIGHTLY DROOPING					1	1	1	1				
3 - DROOPING EYELIDS (HALF-CLOSED)												
4 - EYELIDS COMPLETELY SHUT												
RESPIRATORY RATE												
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	3	3	3	3	3	3	3	3	3	3	3	3
2 - DECREASED: BELOW 80/MIN.												
3 - INCREASED: ABOVE 110/MIN.												
RESPIRATORY CHARACTER												
1 - NORMAL	3	3	3	3	3	3	2	3	3	3	3	3
2 - RALES: ABNORMAL SOUND ACCOMPANYING BREATHING												
3 - RETCHING												
4 - DYSPNEIC: SHORT OF BREATH												
5 - GASPING												
RED DEPOSITS - eyes												
1 - PRESENT												
2 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
RED DEPOSITS - nose												
1 - PRESENT									1	1	1	1
2 - ABSENT	3	3	3	3	3	3	3	3	2	2	2	2

Counts indicate the number of animals observed with a particular finding.

TABLE 1
FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
RED DEPOSITS - mouth												
1 - PRESENT												
2 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
CRUSTY DEPOSITS - eyes												
1 - PRESENT												
2 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
CRUSTY DEPOSITS - nose												
1 - PRESENT												
2 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
CRUSTY DEPOSITS - mouth												
1 - PRESENT												
2 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
MUCOUS MEMBRANES - color												
1 - PINK	3	3	3	3	3	3	3	3	3	3	3	3
2 - PALE												
3 - DARKENED												
4 - DARKENED, BROWN												
5 - BRIGHT, DEEP RED FLUSH												
EYES - color												
1 - PINK	3	3	3	3	3	3	3	3	3	3	3	3
2 - PALE												
3 - DARKENED												
4 - DARKENED, BROWN												
5 - BRIGHT, DEEP RED FLUSH												
SKIN - color												
1 - PINK	3	3	3	3	3	3	3	3	3	3	3	3
2 - PALE												
3 - DARKENED												
4 - DARKENED, BROWN												
5 - BRIGHT, DEEP RED FLUSH												

Counts indicate the number of animals observed with a particular finding.

TABLE 1
FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
EYE PROMINENCE												
1 - NORMAL	3	3	3	3	3	3	3	3	3	3	3	3
2 - EXOPHTHALMUS												
3 - ENOPHTHALMUS												
MUSCLE TONE												
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	2	2	2	2	3	3	3	3	1	1	1	1
2 - MUSCLE IS SOFT AND FLABBY									1	1	1	1
3 - MUSCLE IS TENSE AND HARD	1	1	1	1					1	1	1	1
TIME TO FIRST STEP (seconds)												
REQUIRES NUMERICAL INPUT												
MOBILITY												
1 - NORMAL	3	3	3	3					3	3	3	3
2 - SLIGHTLY IMPAIRED					3	3	3	3				
3 - MODERATELY IMPAIRED												
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE												
GAIT												
1 - NORMAL	3	3	3	3					2	2	1	1
2 - WALKS ON TIPTOES									1	1	2	1
3 - BODY DRAGS, ABDOMEN CONTACTS SURFACE, BODY SWAYS												
4 - HINDLIMBS SPLAYED OR DRAGGING, UNABLE TO SUPPORT WEIGHT					2	3	3	3				1
5 - HUNCHED BODY					2	3	3	3	1	1	1	1
6 - ATAXIA, EXCESSIVE SWAY, ROCKS OR LURCHES AS PROCEEDS FORWARD					3	2	2	3				
7 - WALKS ON METATARSUS												
CONVULSIONS - CLONIC												
1 - ABSENT	3	3	3	3	2	2	1	2	3	3	3	3
2- TWITCHES (BACK MUSCLES)												
3 - REPETITIVE MOVEMENT OF MOUTH AND JAWS					1	1	2	1				
4 - CLONIC TREMORS OF THE LIMBS												
5 - WHOLE BODY TREMORS												
6 - CLONIC CONVULSIONS												
7 - WET DOG SHAKES												

Counts indicate the number of animals observed with a particular finding.

FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
CONVULSIONS - TONIC												
1 - ABSENT	3	3	3	3	3	3	3	3	3	3	3	3
2 - TONIC: CONTRACTION OF EXTENSORS SUCH THAT LIMBS ARE RIGID AND EXTENDED												
3 - OPISTHOTONUS: HEAD, BODY AND LIMBS RIGIDLY ARCHED BACKWARDS												
4 - EMPROSTHOTONUS: HEAD, BODY AND LIMBS EXTENDED FORWARD												
5 - 'POPCORN SEIZURE': ANIMAL REPEATEDLY JUMPS OR BOUNCES IN AIR												
6 - ASPHYXIAL: BOUTS OF SEVERE CLONIC-TONIC CONVULSIONS												
TREMORS												
1 - NONE	3	3	3	3	3	3	3	3	3	3	3	3
2 - SLIGHT (1.5mm)												
3 - MODERATELY COARSE (3 mm), SLIGHT IMPAIRMENT OF LOCOMOTION												
4 - MARKEDLY COARSE (4.5mm), MODERATE/MARKED IMPAIRMENT OF LOCOMOTION												
5 - EXTREMELY COARSE (6 mm), LOCOMOTION IMPOSSIBLE												
GAIT SCORE												
1 - NORMAL	3	3	3	3					2	2	2	2
2 - SLIGHT IMPAIRMENT, BUT DEFINITE					3	3	3	3	1	1	1	1
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING												
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS												
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT FALLING												
AROUSAL												
1 - VERY LOW: STUPOR, COMA, LITTLE OR NO RESPONSIVENESS												
2 - LOW: SOMEWHAT STUPOROUS						1						
3 - NORMAL: ALERT, EXPLORATORY MOVEMENTS	3	3	3	3	3	2	2	3	3	3	3	3
4 - SOMEWHAT HIGH: SLIGHT EXCITEMENT, TENSE, SUDDEN DARTING OR FREEZING							1					
5 - VERY HIGH: HYPERALERT, EXCITED, SUDDEN BOUTS OF RUNNING OR BODY MOVEMENTS												

Counts indicate the number of animals observed with a particular finding.

TABLE 1
FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
BIZARRE/STEREOTYPIC BEHAVIOR												
1 - NONE	3	3	3	3					2	2	2	2
2 - HEAD FLICK: HEAD SHAKING OR BACKWARD FLIP OF HEAD					3	3	2	3				
3 - HEAD SEARCH: STEREOTYPED, REPETITIVE TURNING OF HEAD FROM SIDE TO SIDE					3	3	3	3				
4 - HALLUCINATORY: APPEARS TO BE RESPONDING TO OBJECTS NOT PRESENT												
5 - COMPULSIVE LICKING OR BITING												
6 - PRANCING: RESTLESS SHIFTING FROM ONE FORELIMB TO THE OTHER												
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY												
8 - AIMLESS WANDERING: PROGRESSIVE, SLOW, PLODDING MOVEMENTS, NO APPARENT PURPOSE												
9 - CIRCLING: TENDENCY TO MOVE IN CIRCLES AROUND OBJECTS, OR IN AN OPEN ENVIRONMENT					2	2	2	2				
10 - WALTZING: RAPID TURNING IN CIRCLES												
11 - RETROPULSION: ANIMAL WALKS BACKWARDS					1	2	2	2	1	1	1	1
12 - SPATIAL DISORIENTATION: WALKING OR STUMBLING INTO OBJECTS												
13 - SIDE TO SIDE ROCKING												
14 - STRAUB TAIL: INCREASED TAIL ELEVATION												
15 - VERTICAL JUMPING												
16 - PACING WITHOUT PURPOSE												
17 - HEAD BOBBING												
18 - WRITHING: LYING DOWN, WAVELIKE MOVEMENTS OF ABDOMEN, ALTERNATING LIMB MOVEMENTS												
REARING												
REQUIRES NUMERICAL INPUT	17	17	17	17	1	1	1	1	13	13	13	13
BACKING												
REQUIRES NUMERICAL INPUT	0	0	0	0	4	4	4	4	2	2	2	2
GROOMING												
REQUIRES NUMERICAL INPUT	3	3	3	3	1	1	1	1	2	2	2	2
URINATION												
REQUIRES NUMERICAL INPUT	0	0	0	0	1	1	1	1	1	1	1	1
DEFECATION												
REQUIRES NUMERICAL INPUT	1	1	1	1	0	0	0	0	0	0	0	0

Counts indicate the number of animals observed with a particular finding.

TABLE 1
FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
APPROACH RESPONSE												
1 - NO REACTION	1	1	1	1								
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	2	2	2	2	3	3	3	3	3	3	2	3
3 - MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION											1	
4 - FREEZES, ACTUAL MUSCLE CONTRACTION												
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS												
TOUCH RESPONSE												
1 - NO REACTION												
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	2	2	2	2	3	3	3	3	3	3	3	3
3 - MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	1	1	1	1								
4 - FREEZES, ACTUAL MUSCLE CONTRACTION												
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS												
STARTLE RESPONSE												
1 - NO REACTION					3	3	3	3				
2 - SLIGHT REACTION, EAR FLICK OR SOME EVIDENCE THAT SNAP WAS HEARD	3	3	2	3					1	2	1	2
3 - MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION			1						2	1	2	1
4 - FREEZES, ACTUAL MUSCLE CONTRACTION												
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS												
TAIL PINCH RESPONSE												
1 - NO REACTION												
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	2	2	2	2	3	3	3	3	2	2	2	2
3 - MORE ENERGETIC RESPONSE THAN (2), WITH/WITHOUT VOCALIZATION	1	1	1	1					1	1	1	1
4 - FREEZES, ACTUAL MUSCLE CONTRACTION												
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS												
OLFACTORY ORIENTATION												
1 - NO REACTION PRESENT												
2 - REACTION PRESENT: ANIMAL APPROACHES SWAB MAKING SNIFFING MOVEMENTS WITH NOSE	3	3	3	3	3	3	3	3	3	3	3	3
PUPIL RESPONSE												
1 - NO PUPIL RESPONSE					3	3	3	3				
2 - PUPIL RESPONSE PRESENT	3	3	3	3					3	3	3	3
EYEBLINK RESPONSE												
1 - NO EYEBLINK RESPONSE												
2 - EYEBLINK RESPONSE PRESENT	3	3	3	3	3	3	3	3	3	3	3	3

Counts indicate the number of animals observed with a particular finding.

FOB OBSERVATIONS - NO. OF OCCURRENCES OF FINDINGS

TREATMENT:	CONTROL				IDPN				Parathion			
TECHNICIAN	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ	GRG	MJM	TAP	AZ
FORELIMB EXTENSION												
1 - NO FORELIMB EXTENSION					2	2	2	2				
2 - FORELIMB EXTENSION PRESENT	3	3	3	3	1	1	1	1	3	3	3	3
HINDLIMB EXTENSION												
1 - NO HINDLIMB EXTENSION					3	3	3	3	2	2	1	1
2 - HINDLIMB EXTENSION PRESENT	3	3	3	3					1	1	2	2
AIR RIGHTING REFLEX												
1 - NORMAL	3	3	3	3					3	3	3	3
2 - SLIGHTLY UNCOORDINATED					1	1	1	1				
3 - LANDS ON SIDE					1	1	1	1				
4 - LANDS ON BACK					1	1	1	1				

Counts indicate the number of animals observed with a particular finding.

TABLE 2
FOB OBSERVATIONS – FINDINGS OMITTED

TECHNICIAN	TREATMENT	CATEGORY OMITTED
TAP	IDPN	RESPIRATORY CHARACTER
AZ	IDPN	EASE OF REMOVAL
GRG	PARATHION	CONVULSIONS – CLONIC
MJM	PARATHION	BITING

WIL-99310

AN INTER-OBSERVER RELIABILITY STUDY OF INDIVIDUALS ASSIGNED TO PERFORM FUNCTIONAL OBSERVATIONAL BATTERY OBSERVATIONS FOR NEUROTOXICITY STUDIES

Study Date Range: April 13-29, 2004

STUDY OBJECTIVE:

The objective of this study was to train personnel to conduct the Functional Observational Battery (FOB) and to assess inter-observer reliability of the same individuals. The inter-observer reliability also included one individual that had been previously trained to further demonstrate inter-observer reliability of the newly trained individuals with those currently approved to conduct neurotoxicity studies. FOB inter-observer reliability studies serve as training for new employees, as well as on-going training for current employees.

CONTROL ARTICLES:

Mazola® corn oil was used as the negative control article. Three positive control articles, 3,3´-Iminodipropionitrile (IDPN), Parathion and d-Amphetamine, were used to elicit behavioral changes in the animals. IDPN was administered orally (gavage) at 2000 mg/kg, Parathion was administered orally (gavage) at 4 mg/kg, and d-Amphetamine was administered by intraperitoneal injection at 2 mg/kg. All positive and negative control articles were administered as a single dose.

TEST SYSTEM:

All animals used on the study were female Sprague-Dawley Crl:CD® (SD)IGS BR rats obtained from the WIL Research Laboratories, Inc. stock colony. Animals were randomly assigned to treatment groups using a computer program. The study was conducted according the protocol and WIL standard operating procedures.

ENVIRONMENTAL CONDITIONS:

The animals were housed and maintained under conditions consistent with maintaining good health. Temperature and relative humidity were set to maintain at 71 ± 5° C and 30-70%, respectively, in a room with a 12 hour light (6 a.m. to 6 p.m.)/dark photoperiod. Temperature and relative humidity were recorded once daily. The ventilation rate was set at a minimum of 10 room air changes per hour using 100% fresh air. The facilities at WIL Research Laboratories, Inc. are fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International).

VIABILITY OBSERVATIONS:

The rats were observed for mortality/moribundity and general condition twice daily, in the morning and in the afternoon.

BODY WEIGHTS:

Body weights were recorded on days of dose administration for calculation of doses only.

FUNCTIONAL OBSERVATIONAL BATTERY ASSESSMENTS:

The Functional Observational Battery used at WIL Research Laboratories, Inc. is based on previously developed protocols (Moser et al., 1991; Irwin, 1968; Gad, 1982; Moser et al., 1988; Haggerty, 1989; O'Donoghue, 1989). Testing for the Inter-observer Reliability testing (described below) was performed by trained technicians who did not know the animal's group assignment. The time of testing was determined by the Study Director based on the appearance of the expected behavioral signs following dosing. Animals were observed for the following parameters as described below (see WIL standard operating procedure No. T1-112, as revised, for a description of scoring criteria):

HOME CAGE OBSERVATIONS:

Posture
Convulsions/Tremors
Feces consistency
Biting
Palpebral (eyelid) closure

HANDLING OBSERVATIONS:

Ease of removal from cage
Lacrimation/chromodacryorrhea
Piloerection
Palpebral closure
Red/crusty deposits
Eye prominence
Ease of handling animal in hand
Salivation
Fur appearance
Respiratory rate/character
Mucous membranes/eye/skin color
Muscle tone

OPEN FIELD OBSERVATIONS: (evaluated over a 2-minute observation period)

Mobility
Rearing
Convulsions/tremors
Grooming
Bizarre/stereotypic behavior
Time to first step (seconds)
Gait
Arousal
Urination/defecation
Gait score
Backing

SENSORY OBSERVATIONS:

Approach response	Touch response
Startle response	Tail pinch
Pupil response	Eyeblink response
Forelimb extension	Hindlimb extension
Air righting reflex	Olfactory orientation

The study design consisted of three distinct phases to ensure the most adequate training and reliability among the technicians. Phases were designed as a progression to allow for training and discussion prior to the final phase, which evaluated the inter-observer reliability. The phases of testing are described as follows:

PHASE I:

Phase I testing consisted of FOB assessments on naive stock animals. Each technician observed up to 60 rats through the entire FOB assessment. The purpose of Phase I testing was to ensure consistent and accurate use of all equipment and to gain a strong knowledge of the stereotypic behavior of naive animals. All rats used in Phase I testing were returned to stock following FOB assessments.

PHASE II:

Phase II testing consisted of an open discussion of each animal's observations conducted in a group setting. Two animals per group were dosed with IDPN, Parathion, d-Amphetamine or corn oil and evaluated by the observers once the effects were apparent. Phase II allowed for open discussion of observations and interpretation of the findings. All animals used in Phase II testing were euthanized by carbon dioxide inhalation and carcasses discarded following testing.

PHASE III:

Inter-observer Reliability testing consisted of three animals per group dosed with a single dose of Parathion, IDPN, d-Amphetamine or corn oil and observed at a time determined by the Study Director or designee. Each observer individually recorded observations for each animal to evaluate the inter-observer reliability. All animals used in Inter-observer Reliability testing were euthanized by carbon dioxide inhalation and carcasses discarded following testing.

CRITERIA FOR EVALUATION OF TECHNICIANS:

The following criteria were used to evaluate the ability of technicians to reliably distinguish signs of neurotoxicity.

1. No omission of findings within the categories of Home Cage Observations, Handling Observations, Open Field Observations and Sensory Observations.

2. A difference of no more than two grades (severity) for a given finding in each category.

RESULTS:

VIABILITY:

All animals survived until scheduled euthanasia.

FUNCTIONAL OBSERVATIONAL BATTERY ASSESSMENTS:

Observers B, C, D and E were consistent in the findings reported when corn oil, IDPN, Parathion or d-Amphetamine was administered (Table 1). There were no obvious or gross inconsistencies among the calls with the exception of observer E who differed consistently when evaluating pupillary response. Therefore, these four observers were considered to have met acceptable for performing the functional observational battery on neurotoxicity studies. However, prior to working independently on studies, observer E will undergo additional training and demonstrate proficiency in the evaluation of pupillary response.

Observer A differed significantly from the common response of the other observers in several categories. Therefore, observer A was not considered to have met acceptable criteria for performing functional observational battery testing on neurotoxicity studies.

It should be noted there were six apparent omissions of observations (Table 2) which upon further review were found to be of no consequence.

REFERENCES:

Gad, S.C. A neuromuscular screen for use in industrial toxicology. *Journal of Toxicology and Environmental Health* **1982,** *9(5-6),* 691-704.

Haggerty, G.C. Development of tier I neurobehavioral testing capabilities for incorporation into pivotal rodent safety assessment studies. *Journal of the American College of Toxicology* **1989,** *8(1),* 53-69.

Irwin, S. Comprehensive observational assessment: Ia. a systematic, quantitative procedure for assessing the behavioral and physiologic state of the mouse. *Psychopharmacologia* **1968,** *13,* 222-257.

Moser, V.C.; McCormick, J.P.; Creason, J.P.; MacPhail, R.C. Comparison of chlordimeform and carbaryl using a functional observational battery. *Fundamentals of Applied Toxicology* **1988,** *11(2),* 189-206.

Moser, V.C.; McDaniel, K.L.; Phillips, P.M. Rat strain and stock comparisons using a functional observational battery: baseline values and effects of amitraz. *Toxicology and Applied Pharmacology* **1991,** *108(2),* 267-283.

O'Donoghue, J.L. (1989) Screening for neurotoxicity using a neurologically based examination and neuropathology. *J. Amer. Coll. Toxicol.* 8:97-116.

WIL-99310

TABLE 1
FOB2 - INTEROBSERVER COMPARISONS

	Animal #52298					Animal #52277					Animal #52222					Animal #52210					Animal #52321					Animal #52315				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
1 - SITTING OR STANDING NORMALLY		X		X	X	X	X		X	X			X								X									
2 - ASLEEP, LYING ON SIDE OR CURLED UP								X																						
3 - ALERT, ORIENTED TOWARD OBSERVER			X								X	X			X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
4 - SITTING, HEAD HELD LOW	X		X																											
5 - FLATTENED, LIMBS MAY BE EXTENDED																														
6 - LYING ON SIDE, LIMBS IN AIR																														
7 - IMMOBILE																														
8 - REARING														X															X	
9 - SPLAYED HINDLEGS																														
10 - PROSTRATION																														
CONVULSIONS - CLONIC																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
2 - TWITCHES (BACK MUSCLES)																														
3 - IRREGULAR JERKING MOVEMENTS OF THE LIMBS																														
4 - CLONIC WHOLE-BODY CONVULSIONS																														
5 - HEAD AND/OR BODY TWITCHES (MYOCLONUS)																				X										
6 - MUSCLE FASICULATIONS																														
(CHEWING)																														
CONVULSIONS - TONIC																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - TONIC: CONTRACTION OF EXTENSORS SUCH THAT LIMBS ARE RIGID AND EXTENDED																														
ARCHED BACKWARDS																														
EXTENDED FORWARD																														
5 - 'POPCORN SEIZURE': ANIMAL REPEATEDLY JUMPS OR BOUNCES IN AIR																														
6 - ASPHYXIAL: BOUTS OF SEVERE CLONIC-TONIC CONVULSIONS																														

WIL-99310

TABLE 1
FOB2 - INTEROBSERVER COMPARISONS

Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
TREMORS																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X
2 - SLIGHT (1.5mm)																X										X				
3 - MODERATELY COARSE (3 mm)																														
4 - MARKEDLY COARSE (4.5mm)																														
5 - EXTREMELY COARSE (6 mm)																														
BITING																														
1 - NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - BITING OF CAGE																														
3 - BITING OF SELF																														
PALPEBRAL CLOSURE																														
1 - EYELIDS WIDE OPEN		X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - EYELIDS SLIGHTLY DROOPING	X			X	X																									
3 - DROOPING EYELIDS (HALF-CLOSED)																														
4 - EYELIDS COMPLETELY SHUT																														
FECES CONSISTENCY																														
1 - PELLETS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
2 - PELLETS, PARTIALLY FORMED																														
3 - UNFORMED, DIARRHEA																														
4 - PELLETS ABSENT																														
EASE OF HANDLING IN HAND																														
1 - LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION								X							X															
3 - MODERATELY HIGH: MAY FREEZE, BE TENSE OR RIGID, WITH/WITHOUT VOCALIZATION																														
4 - HIGH: SQUIRMS, TWISTS, ATTEMPTS TO BITE, WITH/WITHOUT VOCALIZATION																														
LACRIMATION																														
1 - NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHT																														
3 - SEVERE																														
CHROMODACRYORRHEA																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PRESENT																														

WIL-99310

TABLE 1
FOB2 - INTEROBSERVER COMPARISONS

Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
SALIVATION																														
1 - NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHT																X														
3 - SEVERE																														
PILOERECTION																														
1 - NONE	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X			X	X		
2 - SLIGHT										X					X											X			X	X
3 - SEVERE																														
FUR APPEARANCE																														
1 - NORMAL: CLEAN AND GROOMED	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHTLY SOILED																														
3 - VERY SOILED, CRUSTY																														
PALPEBRAL CLOSURE																														
1 - EYELIDS WIDE OPEN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - EYELIDS SLIGHTLY DROOPING																														
3 - DROOPING EYELIDS (HALF-CLOSED)																														
4 - EYELIDS COMPLETELY SHUT																														
RESPIRATORY RATE																														
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - DECREASED: BELOW 80/MIN.																														
3 - INCREASED: ABOVE 110/MIN.																														
RESPIRATORY CHARACTER																														
1 - NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - RALES: ABNORMAL SOUND ACCOMPANYING BREATHING																														
3 - RETCHING																														
4 - DYSPNEIC: SHORT OF BREATH																														
5 - GASPING																														
RED DEPOSITS - eyes																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RED DEPOSITS - nose																														
1 - PRESENT																											X			
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X

WIL-99310

TABLE 1
FOB2 - INTEROBSERVER COMPARISONS

Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
RED DEPOSITS - mouth																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRUSTY DEPOSITS - eyes																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRUSTY DEPOSITS - nose																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRUSTY DEPOSITS - mouth																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MUCOUS MEMBRANES - color																														
1 - PINK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PALE																														
3 - DARKENED																														
4 - DARKENED, BROWN																														
5 - BRIGHT, DEEP RED FLUSH																														
EYES - color																														
1 - PINK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PALE																														
3 - DARKENED																														
4 - DARKENED, BROWN																														
5 - BRIGHT, DEEP RED FLUSH																														
SKIN - color																														
1 - PINK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PALE																														
3 - DARKENED																														
4 - DARKENED, BROWN																														
5 - BRIGHT, DEEP RED FLUSH																														
EYE PROMINENCE																														
1 - NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X
2 - EXOPHTHALMUS																X			X											
3 - ENOPHTHALMUS																														

WIL-99310

TABLE 1
FOB2 - INTEROBSERVER COMPARISONS

Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
MUSCLE TONE																														
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - MUSCLE IS SOFT AND FLABBY																														
3 - MUSCLE IS TENSE AND HARD																														
MOBILITY																														
1 - NORMAL						X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHTLY IMPAIRED	X	X	X	X	X																									
3 - MODERATELY IMPAIRED																														
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE																														
GAIT																														
1 - NORMAL						X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X		
2 - WALKS ON TIPTOES																									X					X
3 - BODY DRAGS, ABDOMEN CONTACTS SURFACE, BODY SWAYS																														
4 - HINDLIMBS SPLAYED OR DRAGGING, UNABLE TO SUPPORT WEIGHT	X	X			X																									
5 - HUNCHED BODY	X	X							X																X	X			X	X
6 - ATAXIA, EXCESSIVE SWAY, ROCKS OR LURCHES AS PROCEEDS FORWARD	X	X	X	X																										
7 - WALKS ON METATARSUS																														
CONVULSIONS - CLONIC																														
1 - ABSENT	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
2- TWITCHES (BACK MUSCLES)					X																									
3 - REPETITIVE MOVEMENT OF MOUTH AND JAWS																														
4 - CLONIC TREMORS OF THE LIMBS																														
5 - WHOLE BODY TREMORS																														
6 - CLONIC CONVULSIONS																														
7 - WET DOG SHAKES																														
CONVULSIONS - TONIC																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - TONIC: CONTRACTION OF EXTENSORS SUCH THAT LIMBS ARE RIGID AND EXTENDED																														
3 - OPISTHOTONUS: HEAD, BODY AND LIMBS RIGIDLY ARCHED BACKWARDS																														
4 - EMPROSTHOTONUS: HEAD, BODY AND LIMBS EXTENDED FORWARD																														

WIL-99310

TABLE 1
FOB2 - INTEROBSERVER COMPARISONS

Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
5 - 'POPCORN SEIZURE': ANIMAL REPEATEDLY JUMPS OR BOUNCES IN AIR																														
6 - ASPHYXIAL: BOUTS OF SEVERE CLONIC-TONIC CONVULSIONS																														
TREMORS																														
1 - NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
2 - SLIGHT (1.5mm)																										X				
3 - MODERATELY COARSE (3 mm), SLIGHT IMPAIRMENT OF LOCOMOTION																														
4 - MARKEDLY COARSE (4.5mm), MODERATE/MARKED IMPAIRMENT OF LOCOMOTION																														
5 - EXTREMELY COARSE (6 mm), LOCOMOTION IMPOSSIBLE																														
GAIT SCORE																														
1 - NORMAL						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	X	X	X	X																										
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING					X																									
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS																														
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT FALLING																														
AROUSAL																														
1 - VERY LOW: STUPOR, COMA, LITTLE OR NO RESPONSIVENESS																														
2 - LOW: SOMEWHAT STUPOROUS																									X					
3 - NORMAL: ALERT, EXPLORATORY MOVEMENTS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
4 - SOMEWHAT HIGH: SLIGHT EXCITEMENT, TENSE, SUDDEN DARTING OR FREEZING																														
5 - VERY HIGH: HYPERALERT, EXCITED, SUDDEN BOUTS OF RUNNING OR BODY MOVEMENTS																														

TABLE 1
FOB2 - INTEROBSERVER COMPARISONS

Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
BIZARRE/STEREOTYPIC BEHAVIOR																														
1 - NONE						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
2 - HEAD FLICK: HEAD SHAKING OR BACKWARD FLIP OF HEAD	X	X	X	X	X																			X						
3 - HEAD SEARCH: STEREOTYPED, REPETITIVE TURNING OF HEAD FROM SIDE TO SIDE		X		X	X																									
4 - HALLUCINATORY: APPEARS TO BE RESPONDING TO OBJECTS NOT PRESENT																														
5 - COMPULSIVE LICKING OR BITING																														
6 - PRANCING: RESTLESS SHIFTING FROM ONE FORELIMB TO THE OTHER																														
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY																														
8 - AIMLESS WANDERING: PROGRESSIVE, SLOW, PLODDING MOVEMENTS, NO APPARENT PURPOSE																														
BIZARRE/STEREOTYPIC BEHAVIOR (Continued)																														
9 - CIRCLING: TENDENCY TO MOVE IN CIRCLES AROUND OBJECTS, OR IN AN OPEN ENVIRONMENT	X		X		X																									
10 - WALTZING: RAPID TURNING IN CIRCLES																														
11 - RETROPULSION: ANIMAL WALKS BACKWARDS				X																										
12 - SPATIAL DISORIENTATION: WALKING OR STUMBLING INTO OBJECTS	X																													
13 - SIDE TO SIDE ROCKING																														
14 - STRAUB TAIL: INCREASED TAIL ELEVATION																														
15 - VERTICAL JUMPING																														
16 - PACING WITHOUT PURPOSE																														
17 - HEAD BOBBING			X		X																									
18 - WRITHING: LYING DOWN, WAVELIKE MOVEMENTS OF ABDOMEN, ALTERNATING LIMB MOVEMENTS																														
PUPIL RESPONSE																														
1 - NO PUPIL RESPONSE	X	X	X	X	X												X										X			
2 - PUPIL RESPONSE PRESENT						X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X
AIR RIGHTING REFLEX																														
1 - NORMAL						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHTLY UNCOORDINATED																														
3 - LANDS ON SIDE	X			X																										
4 - LANDS ON BACK		X	X		X																									

TABLE 1
FOB2 - INTER-OBSERVER COMPARISONS

	Animal #52247					Animal #52225					Animal #52216					Animal #51868					Animal #52254					Animal #52338				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
POSTURE																														
1 - SITTING OR STANDING NORMALLY	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X	X	X	X	X
2 - ASLEEP, LYING ON SIDE OR CURLED UP																					X	X	X	X	X					
3 - ALERT, ORIENTED TOWARD OBSERVER			X																											
4 - SITTING, HEAD HELD LOW																														
5 - FLATTENED, LIMBS MAY BE EXTENDED																														
6 - LYING ON SIDE, LIMBS IN AIR																														
7 - IMMOBILE																														
8 - REARING																														
9 - SPLAYED HINDLEGS																														
10 - PROSTRATION																														
CONVULSIONS - CLONIC																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X
2 - TWITCHES (BACK MUSCLES)																														
3 - IRREGULAR JERKING MOVEMENTS OF THE LIMBS																														
4 - CLONIC WHOLE-BODY CONVULSIONS																														
5 - HEAD AND/OR BODY TWITCHES (MYOCLONUS)																X				X										
6 - MUSCLE FASICULATIONS																														
7 - REPETITIVE MOVEMENT OF MOUTH AND JAWS (CHEWING)																														
CONVULSIONS - TONIC																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - TONIC: CONTRACTION OF EXTENSORS SUCH THAT LIMBS ARE RIGID AND EXTENDED																														
3 - OPISTHOTONUS: HEAD, BODY AND LIMBS RIGIDLY ARCHED BACKWARDS																														
4 - EMPROSTHOTONUS: HEAD, BODY AND LIMBS EXTENDED FORWARD																														
5 - 'POPCORN SEIZURE': ANIMAL REPEATEDLY JUMPS OR BOUNCES IN AIR																														
6 - ASPHYXIAL: BOUTS OF SEVERE CLONIC-TONIC CONVULSIONS																														
TREMORS																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
2 - SLIGHT (1.5mm)											X																		X	
3 - MODERATELY COARSE (3 mm)																														

TABLE 1
FOB2 - INTER-OBSERVER COMPARISONS

	Animal #52247					Animal #52225					Animal #52216					Animal #51868					Animal #52254					Animal #52338				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
4 - MARKEDLY COARSE (4.5mm)																														
5 - EXTREMELY COARSE (6 mm)																														
BITING																														
1 - NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - BITING OF CAGE																														
3 - BITING OF SELF																														
PALPEBRAL CLOSURE																														
1 - EYELIDS WIDE OPEN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X					X			X	X	X	X	X
2 - EYELIDS SLIGHTLY DROOPING																	X		X	X										
3 - DROOPING EYELIDS (HALF-CLOSED)																														
4 - EYELIDS COMPLETELY SHUT																					X	X		X	X					
FECES CONSISTENCY																														
1 - PELLETS		X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X		X			X	X	X	
2 - PELLETS, PARTIALLY FORMED	X		X																	X					X	X				
3 - UNFORMED, DIARRHEA			X												X										X			X		X
4 - PELLETS ABSENT																														
EASE OF HANDLING IN HAND																														
1 - LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION															X															
3 - MODERATELY HIGH: MAY FREEZE, BE TENSE OR RIGID, WITH/WITHOUT VOCALIZATION																														
4 - HIGH: SQUIRMS, TWISTS, ATTEMPTS TO BITE, WITH/WITHOUT VOCALIZATION																														
LACRIMATION																														
1 - NONE	X	X	X	X	X	X	X	X	X	X		X					X	X	X	X		X		X	X	X	X	X	X	
2 - SLIGHT											X		X	X	X	X					X		X							X
3 - SEVERE																														
CHROMODACRYORRHEA																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PRESENT																														
SALIVATION																														
1 - NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHT																														
3 - SEVERE																														

TABLE 1
FOB2 - INTER-OBSERVER COMPARISONS

	Animal #52247					Animal #52225					Animal #52216					Animal #51868					Animal #52254					Animal #52338				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
PILOERECTION																														
1 - NONE	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - SLIGHT					X																									
3 - SEVERE																														
FUR APPEARANCE																														
1 - NORMAL: CLEAN AND GROOMED						X	X	X	X	X	X	X	X	X			X	X	X	X		X	X	X		X	X	X	X	X
2 - SLIGHTLY SOILED	X	X	X	X	X										X	X					X				X					
3 - VERY SOILED, CRUSTY																														
PALPEBRAL CLOSURE																														
1 - EYELIDS WIDE OPEN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X			X	X	X	X	X
2 - EYELIDS SLIGHTLY DROOPING																				X	X	X		X						
3 - DROOPING EYELIDS (HALF-CLOSED)																									X					
4 - EYELIDS COMPLETELY SHUT																														
RESPIRATORY RATE																														
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - DECREASED: BELOW 80/MIN.																														
3 - INCREASED: ABOVE 110/MIN.																														
RESPIRATORY CHARACTER																														
1 - NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - RALES: ABNORMAL SOUND ACCOMPANYING BREATHING																														
3 - RETCHING																														
4 - DYSPNEIC: SHORT OF BREATH																														
5 - GASPING																														
RED DEPOSITS - eyes																														
1 - PRESENT											X						X					X								
2 - ABSENT	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X
RED DEPOSITS - nose																														
1 - PRESENT		X														X	X					X								
2 - ABSENT	X		X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X		X	X	X	X	X	X	X	X
RED DEPOSITS - mouth																														
1 - PRESENT																	X													
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
CRUSTY DEPOSITS - eyes																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TABLE 1
FOB2 - INTER-OBSERVER COMPARISONS

	Animal #52247					Animal #52225					Animal #52216					Animal #51868					Animal #52254					Animal #52338				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
CRUSTY DEPOSITS - nose																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRUSTY DEPOSITS - mouth																														
1 - PRESENT																														
2 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MUCOUS MEMBRANES - color																														
1 - PINK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PALE																														
3 - DARKENED																														
4 - DARKENED, BROWN																														
5 - BRIGHT, DEEP RED FLUSH																														
EYES - color																														
1 - PINK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PALE																														
3 - DARKENED																														
4 - DARKENED, BROWN																														
5 - BRIGHT, DEEP RED FLUSH																														
SKIN - color																														
1 - PINK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - PALE																X														
3 - DARKENED																														
4 - DARKENED, BROWN																														
5 - BRIGHT, DEEP RED FLUSH																														
EYE PROMINENCE																														
1 - NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - EXOPHTHALMUS																														
3 - ENOPHTHALMUS																														
MUSCLE TONE																														
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X			X		X	X		X	X	X	X	X	X	X
2 - MUSCLE IS SOFT AND FLABBY																	X	X		X			X							
3 - MUSCLE IS TENSE AND HARD					X																									

TABLE 1
FOB2 - INTER-OBSERVER COMPARISONS

	Animal #52247					Animal #52225					Animal #52216					Animal #51868					Animal #52254					Animal #52338				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
MOBILITY																														
1 - NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											X	X	X	X	X
2 - SLIGHTLY IMPAIRED																		X	X	X										
3 - MODERATELY IMPAIRED																X	X				X	X	X	X	X					
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE																														
GAIT																														
1 - NORMAL		X	X	X		X	X	X	X	X	X	X	X	X												X	X	X		
2 - WALKS ON TIPTOES																														
3 - BODY DRAGS, ABDOMEN CONTACTS SURFACE, BODY SWAYS	X																								X					
4 - HINDLIMBS SPLAYED OR DRAGGING, UNABLE TO SUPPORT WEIGHT																X	X		X	X		X		X	X					
5 - HUNCHED BODY	X				X										X	X	X		X		X	X	X	X	X				X	X
6 - ATAXIA, EXCESSIVE SWAY, ROCKS OR LURCHES AS PROCEEDS FORWARD																	X	X	X		X	X	X	X						
7 - WALKS ON METATARSUS																														
CONVULSIONS - CLONIC																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X		X	X	X	X	X
2- TWITCHES (BACK MUSCLES)																									X					
3 - REPETITIVE MOVEMENT OF MOUTH AND JAWS																														
4 - CLONIC TREMORS OF THE LIMBS																														
5 - WHOLE BODY TREMORS																X														
6 - CLONIC CONVULSIONS																					X									
7 - WET DOG SHAKES																														
CONVULSIONS - TONIC																														
1 - ABSENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 - TONIC: CONTRACTION OF EXTENSORS SUCH THAT LIMBS ARE RIGID AND EXTENDED																														
3 - OPISTHOTONUS: HEAD, BODY AND LIMBS RIGIDLY ARCHED BACKWARDS																														
4 - EMPROSTHOTONUS: HEAD, BODY AND LIMBS EXTENDED FORWARD																														
5 - 'POPCORN SEIZURE': ANIMAL REPEATEDLY JUMPS OR BOUNCES IN AIR																														
6 - ASPHYXIAL: BOUTS OF SEVERE CLONIC-TONIC CONVULSIONS																														

TABLE 1
FOB2 - INTER-OBSERVER COMPARISONS

	Animal #52247					Animal #52225					Animal #52216					Animal #51868					Animal #52254					Animal #52338				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
TREMORS																														
1 - NONE	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
2 - SLIGHT (1.5mm)											X			X															X	
3 - MODERATELY COARSE (3 mm), SLIGHT IMPAIRMENT OF LOCOMOTION																														
4 - MARKEDLY COARSE (4.5mm), MODERATE/MARKED IMPAIRMENT OF LOCOMOTION																														
5 - EXTREMELY COARSE (6 mm), LOCOMOTION IMPOSSIBLE																														
GAIT SCORE																														
1 - NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											X	X	X	X	X
2 - SLIGHT IMPAIRMENT, BUT DEFINITE																X		X		X			X		X					
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING																	X		X		X	X		X						
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS																														
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT FALLING																														
AROUSAL																														
1 - VERY LOW: STUPOR, COMA, LITTLE OR NO RESPONSIVENESS																														
2 - LOW: SOMEWHAT STUPOROUS																					X		X	X			X		X	
3 - NORMAL: ALERT, EXPLORATORY MOVEMENTS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X		X		X
4 - SOMEWHAT HIGH: SLIGHT EXCITEMENT, TENSE, SUDDEN DARTING OR FREEZING																														
5 - VERY HIGH: HYPERALERT, EXCITED, SUDDEN BOUTS OF RUNNING OR BODY MOVEMENTS																														
BIZARRE/STEREOTYPIC BEHAVIOR																														
1 - NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											X		X	X	X
2 - HEAD FLICK: HEAD SHAKING OR BACKWARD FLIP OF HEAD																	X		X	X	X	X	X	X	X					
3 - HEAD SEARCH: STEREOTYPED, REPETITIVE TURNING OF HEAD FROM SIDE TO SIDE																	X	X	X	X		X	X	X	X					
4 - HALLUCINATORY: APPEARS TO BE RESPONDING TO OBJECTS NOT PRESENT																					X									
5 - COMPULSIVE LICKING OR BITING																														
6 - PRANCING: RESTLESS SHIFTING FROM ONE FORELIMB TO THE OTHER																														
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY																														
8 - AIMLESS WANDERING: PROGRESSIVE, SLOW, PLODDING MOVEMENTS, NO APPARENT PURPOSE																														

TABLE 1
FOB2 - INTER-OBSERVER COMPARISONS

	Animal #52247					Animal #52225					Animal #52216					Animal #51868					Animal #52254					Animal #52338				
Observer:	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B	A	E	D	C	B
BIZARRE/STEREOTYPIC BEHAVIOR (Continued)																														
9 - CIRCLING: TENDENCY TO MOVE IN CIRCLES AROUND OBJECTS, OR IN AN OPEN ENVIRONMENT																X	X			X	X		X							
10 - WALTZING: RAPID TURNING IN CIRCLES																														
11 - RETROPULSION: ANIMAL WALKS BACKWARDS																X	X	X	X	X	X	X		X	X					
12 - SPATIAL DISORIENTATION: WALKING OR STUMBLING INTO OBJECTS																														
13 - SIDE TO SIDE ROCKING																														
14 - STRAUB TAIL: INCREASED TAIL ELEVATION																														
15 - VERTICAL JUMPING																														
16 - PACING WITHOUT PURPOSE																														
17 - HEAD BOBBING																		X		X			X		X					
18 - WRITHING: LYING DOWN, WAVELIKE MOVEMENTS OF ABDOMEN, ALTERNATING LIMB MOVEMENTS																														
PUPIL RESPONSE																														
1 - NO PUPIL RESPONSE		X					X					X		X			X	X	X	X	X	X	X	X	X		X			
2 - PUPIL RESPONSE PRESENT	X		X	X	X	X		X	X	X	X		X		X	X										X		X	X	X
AIR RIGHTING REFLEX																														
1 - NORMAL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											X	X	X	X	
2 - SLIGHTLY UNCOORDINATED																														X
3 - LANDS ON SIDE																	X	X	X				X							
4 - LANDS ON BACK																X				X	X	X		X	X					

TABLE 2
FOB OBSERVATIONS – FINDINGS OMITTED

OBSERVER	OBSERVATION	NUMBER OMITTED
E	MOBILITY	1
D	MOBILITY	1
E	CONVULSIONS- CLONIC	1
D	FECES CONSISTENCY	1
A	FECES CONSISTENCY	1
E	BIZARRE/STEREOTYPIC BEHAVIOR	1

APPENDIX H

Clinical Pathology Methods, Procedures, and References

CLINICAL PATHOLOGY METHODS, PROCEDURES AND REFERENCES

Serum Chemistry - Hitachi 912

Albumin - Bromcresol Green (BCG) Method, Modification of the Doumas reaction. Default unit: g/dL. Hitachi 912 Application Code 413. Roche Reagent, catalog number 1970569.

A/G Ratio - Calculated from Albumin and Globulin Results.

Alkaline Phosphatase - based on the International Federation of Clinical Chemistry (IFCC) Method (Tietz *et al.* J Clin Chem Clin Biochem 1983; 21:731-748). Default unit: U/L. Hitachi 912 Application Code 158. Roche Reagent, catalog number 2172933.

Alanine Aminotransferase - Modification of the International Federation of Clinical Chemistry (IFCC) recommended method. Default unit: U/L. Hitachi 912 Application Code 706. Roche Reagent, catalog number 450065.

Aspartate Aminotransferase - Kinetic method based on the International Federation of Clinical Chemistry (IFCC) recommendations. Default unit: U/L. Hitachi 912 Application Code 713. Roche Reagent, catalog number 450064.

Bilirubin (Total) - Diazo method developed by Wahlefeld *et al*. Scand J Clin Lab Invest 1972; 29: Supplement 126. Default unit: mg/dL. Hitachi 912 Application Code 018. Roche Reagent, catalog number 1822730.

Bile Acids - An enzymatic reaction read at 405 nm resulting in the formation of Thio-NADH which is proportional to concentration of bile acids. Default unit: µmol/L. Diagnostic Chemicals Limited, catalog number 702-30, Hitachi 912 Application Code 325.

Blood Urea Nitrogen (BUN) - A urease-triggered methodology based upon the method of Talke and Schubert Klin Wschr, 1965; 43:174. Default unit: mg/dL. Hitachi 912 Application Code 427. Roche Reagent, catalog number 1489321.

Calcium – Calcium reacts with o-cresolphthalein complexone in the presence of 8-hydroxyquinoline to form a purple chromophore. Default unit: mg/dL. Hitachi 912 Application Code 180. Roche Reagent, catalog number 1125621.

Chloride - An ion-selective electrode that measures the electrical potential of the ions present in solution. Default unit: mEq/L. Hitachi 912 Application. Roche Reagent, catalog numbers 450043,450042, and 450041.

Cholesterol - Enzymatic reaction as described by Trinder. Ann Clin Biochem 1974; 12:266. Default unit: mg/dL. Hitachi 912 Application Code 722. Roche Reagent, catalog number 450061.

Creatinine - Modified Jaffe reaction based on the work of Popper *et al.* Biochem Z 1937; 291:354, and Seelig and Wust. Aerztl Labor 1969; 15:34. Default unit: mg/dL. Hitachi 912 Application Code 727. Roche Reagent, catalog number 450019.

Gamma-Glutamyltransferase (GGT) - Method based on the studies of Persijn and Van der Slik, J Clin Chem Clin Biochem, 1976; 14:421-427. Default unit: U/L. Hitachi 912 Application Code 479. Roche Reagent, catalog number 2016885.

Globulin - Calculation obtained by subtracting Albumin from Total Protein. Default unit: g/dL.

Glucose - Glucose hexokinase method based on the work of Schmidt, Peterson and Young. Klin Wschr 1961; 39:1244. Methods of Enzymatic Analysis, 2nd Eng ed. New York, Academic Press, 1974; 1196. Anal Biochemistry 1958; 23:301. Default unit: mg/dL. Hitachi 912 Application Code 767. Roche Reagent, catalog number 450058.

Phosphorus - Method involves the formation of ammonium phosphomolybdate. Default unit: mg/dL. Hitachi 912 Application Code 714. Roche Reagent, catalog number 1040898.

Potassium - An ion-selective electrode that measures the electrical potential of the ions present in solution. Default unit: mEq/L. Hitachi 912 Application. Roche Reagent, catalog numbers 450043,450042, and 450041.

Sodium - An ion-selective electrode that measures the electrical potential of the ions present in solution. Default unit: mEq/L. Hitachi 912 Application. Roche Reagent, catalog number 450043,450042, and 450041.

Total Protein - Endpoint biuret method that utilizes a sample blank. Default unit: g/dL. Hitachi 912 Application Code 756. Roche Reagent, catalog number 1040901.

Triglycerides - Method that utilizes lipase from a microorganism to promote rapid and complete hydrolysis of triglycerides to glycerol. Default unit: mg/dL. Hitachi 912 Application Code 781. Roche Reagent, catalog number 1488899.

Hematology - Manual Methods

White Cell Differential - Manual method of counting 100 white cells stained with Wright Giemsa and entered on-line into the data files.
Reticulocyte Count - Manual method of counting the reticulocytes present in 1000 red blood cells stained with New Methylene Blue and entered on-line into the data files.

Red Blood Cell Morphology - Manual method of evaluating red blood cells on a Wright Giemsa-stained slide and entered on-line into the data files.

Platelet Estimate- Manual method of evaluating platelets on a Wright Giemsa-stained slide. Platelet estimation is evaluated and entered on-line into the data files as decreased, adequate or increased. Platelet clumps present on the slide will be reported as part of the RBC morphology.

AMAX Destiny Amelung Coagulation

Mechanical (Ball Method) Measurement – Mechanical measurement methods depend on the physical formation of fibrin strands that attach to a moving mechanical device that either completes or opens an electrical circuit. The elapsed time from the addition of the starting reagent, up to the beginning of fibrin formation is measured.

Prothrombin Time - (PT)/(PTMT)- The coagulation cascade is activated by incubating plasma with the optimal amount of thromboplastin and calcium; the clotting time is then measured. Default unit: sec. Dade® Thromboplastin C Plus* Reagent, catalog number B4216-2.

Activated Partial Thromboplastin Time - (APTT)/(PTTMT) – Factors of the intrinsic coagulation system are activated by incubating the plasma with the optimal amount of phospholipids and a surface activator. The addition of calcium ions triggers the coagulation process, and the clotting time is then measured. Default unit: sec. Dade® Actin® Activated Cephaloplastin Reagent, catalog number B4218-2.

Hematology-Bayer Advia® 120-Siemens Healthcare Diagnostics/(Formerly: Bayer Advia®120)

WBC Count - The whole blood sample is mixed with ADVIA® 120 BASO reagent that contains acid and surfactant. The red cells are hemolyzed, and the white blood cells are then analyzed using two angle laser light scatter signals. Default unit: x 10^3 cells/µL.

RBC / Platelet Count - Both red blood cells and platelets are analyzed by a single optical cytometer after appropriate dilution of the blood sample with ADVIA® 120 RBC/PLT reagent. The red blood cells are isovolumetrically sphered and lightly fixed with glutaraldehyde to preserve the spherical shape. Red cells and platelets are counted from the signals from a common detector with 2 different gain settings. Default unit RBC: x 10^6cells/µL. Default unit PLT: x 10^3 cells/µL

HGB - Hemoglobin: The hemoglobin method is a modification of the manual cyanmethemoglobin method developed by the International Committee for standardization in Hematology (ICSH). Default unit: g/dL.

HCT – Hematocrit: The percentage of blood volume that is occupied by red blood cells. Also referred to as the packed red cell volume. On the ADVIA® 120 Hematology System this parameter is derived from the measured red cell volume (MCV) and the red cell count (RBC). Default unit: %.

MCH - Mean Corpuscular Hemoglobin: the average weight of hemoglobin in the red blood cells, calculated from the RBC and Hgb measurements. Default unit: pg.

MCHC - Mean Corpuscular Hemoglobin Concentration: the average concentration of hemoglobin in the red blood cells. This parameter is computed from the measured hemoglobin and the computed hematocrit. Default unit: g/dL.

MCV - Mean Corpuscular Volume: the average volume of the red blood cells. Default unit: fL

MPV - Mean Platelet Volume: the average volume of the platelets. Default unit: fL.

HDW - Hemoglobin concentration distribution width. This parameter is derived from direct flow cytometric measurements of red cell hemoglobin concentration, and is increased in conditions of red cell anisochromasia. Default unit: g/dL.

RDW - Red Cell Distribution Width: the CV of the RBC volume histogram, calculated from the RBC volume SD and the MCV. Default unit: %.

White blood cell differential - The ADVIA® 120 Hematology System White Blood Cell Differential (WBC DIFF) methods, consists of both the Peroxidase method and the Basophil/Lobularity method. The ADVIA® 120 Hematology System performs a six-part differential that consists of basophils, eosinophils, large unstained cells, lymphocytes, monocytes, and neutrophils. The white blood cell differential count is reported in percent and the actual number of each type of cell per microliter of blood.

Reticulocyte - This method uses a nucleic acid dye (oxazine 750) to stain cellular RNA. The ADVIA® 120 autoRETIC reagent isovolumetrically spheres the erythroid cells and stains cellular RNA. Low-angle laser light scatter, high-angle laser light scatter, and absorption characteristics of all cells are counted and measured. The absorption data are used to classify each cell as a reticulocyte or mature red blood cell based on its RNA content. The reticulocyte is reported in percent and actual number x 10^9cells/Liter = thous/µl.

References:

AMAX Destiny Operation Manual SW V 1.1.4, 31/08/05. Trinity Biotech Plc.

Dade® Actin® Activated Cephaloplastin Reagent – Dade Behring. Package Insert (B4218 G1).

Dade® Thromboplastin C Plus* Reagent – Dade Behring. Package Insert (B4216 G1). 11/05 edition.

ADVIA® 120 Hematology System Operator's Guide: Copyright© 1997, 1998. Siemens Healthcare Diagnostics/(Formerly: Bayer Corporation Diagnostics Division).

APPENDIX I

Pathology Report (WIL Research Laboratories, LLC)

A COMBINED 28-DAY REPEATED DOSE ORAL (GAVAGE) TOXICITY STUDY WITH THE REPRODUCTION/DEVELOPMENTAL TOXICITY SCREENING TEST OF NAPHTHENIC ACID WITH A MAMMALIAN ERYTHROCYTE MICRONUCLEUS TEST IN RATS

PATHOLOGY REPORT

Pathology Department

WIL Research Laboratories, LLC

TABLE OF CONTENTS

Page

Table of Contents **2**
1. Introduction **4**
2. Study Design **4**
3. Methods **5**
3.1. Clinical Pathology 5
3.1.1. Hematology and Coagulation 6
3.1.2. Serum Chemistry 6
3.2. Anatomic Pathology 7
3.2.1. Macroscopic Examination 7
3.2.2. Organ Weights 9
3.2.3. Microscopic Examination 9
3.3. Abbreviations and Definitions 10
3.4. Data Interpretation 10
4. Results **11**
4.1. Survival 11
4.2. Clinical Pathology 11
4.2.1. Hematology and Coagulation 11
4.2.1.1. Changes Associated with Test Substance Administration 11
4.2.1.2. Changes Unrelated to Test Substance Administration 12
4.2.2. Serum Chemistry 13
4.2.2.1. Changes Associated with Test Substance Administration 13
4.2.2.2. Changes Unrelated to Test Substance Administration 13
4.3. Gross Observations 13
4.4. Organ Weights 14
4.5. Histologic Changes 16
4.5.1. Changes Associated with Test Substance Administration 16

Page

4.5.2. Changes of Uncertain Relationship to Test Substance Administration 20
4.5.3. Changes Unrelated to Test Substance Administration 20
5. Discussion 21
6. Conclusions 23
7. References 24
8. Report Submission 26

1. INTRODUCTION

The objective of this study was to evaluate the potential toxic effects of Naphthenic Acid when administered to rats for 28 days and to evaluate the potential of the test substance to affect male and female reproductive performance including gonadal function, mating behavior, conception, parturition and early postnatal development.

2. STUDY DESIGN

Male and female Sprague-Dawley Crl:CD(SD) rats, approximately 70-80 days of age, were administered vehicle, Naphthenic Acid, or cyclophosphamide monohydrate (CYC, a known clastogen) via oral gavage as indicated in the following table. Males were dosed once daily for at least 14 days prior to mating and continuing throughout mating for a minimum of 28 days. Females were dosed daily for 14 days prior to mating, throughout mating and continuing until 1 day prior to termination (lactation day 4 for females that delivered, post-mating day 25 for females that did not deliver). The dosage volume was 10 mL/kg for all groups.

Group Number	Treatment	Dosage Level (mg/kg/day)	Number of Animals Males	Females
1	Sham Control	0	5	5
2	Vehicle Control[a]	0	12	12
3	Naphthenic Acid	100	12	12
4	Naphthenic Acid	300	12	12
5	Naphthenic Acid	900	12	12
6	Positive control[b]	60	5	5

[a] - The vehicle was corn oil.
[b] - The positive control, cyclophosphamide monohydrate, was administered to animals in Group 6 approximately 24 hours prior to euthanasia for bone marrow collection.

3. METHODS

3.1. CLINICAL PATHOLOGY

Hematology, coagulation, and serum chemistry parameters were evaluated on all animals in Groups 2 through 5 just prior to the scheduled necropsy. One female with a total litter loss had blood collected for clinical pathology assessment within 24 hours of the litter loss. Males were fasted overnight prior to blood collection. Blood was collected for hematology and serum chemistry evaluation via the retro-orbital sinus of animals anesthetized by inhalation of isoflurane. Blood was collected for coagulation parameters at the time of euthanasia via the vena cava of animals euthanized by inhalation of carbon dioxide. Anticoagulants were potassium EDTA for the hematology parameters and sodium citrate for the coagulation parameters. Anticoagulants were not used for serum chemistry samples.

The following parameters were evaluated.

3.1.1. HEMATOLOGY AND COAGULATION

Total leukocyte count (WBC)
Erythrocyte count (RBC)
Hemoglobin (HGB)
Hematocrit(HCT)
Mean corpuscular volume (MCV)
Mean corpuscular hemoglobin (MCH)
Mean corpuscular hemoglobin concentration (MCHC)
Platelet count (Platelet)
Prothrombin time (PT)
Activated partial thromboplastin time (APTT)
Reticulocyte count
  Percent (Retic)
  Absolute (Retic Absolute)
Mean Platelet Volume (MPV)
Differential leukocyte count -
  Percent and absolute
  -Neutrophil (NEU)
  -Lymphocyte (LYMPH)
  -Monocyte (MONO)
  -Eosinophil (EOS)
  -Basophil (BASO)
  -Large unstained cell (LUC)
Red cell distribution width (RDW)
Hemoglobin distribution width (HDW)
Platelet estimate [a]
Red cell morphology (RBC Morphology) [a]

( ) - Designates abbreviations used in data tables
[a] - Presented on individual tables if a manual differential was performed, and the manual data were accepted and reported instead of the automated differential data

3.1.2. SERUM CHEMISTRY

Albumin
Total protein
Globulin [by calculation]
Albumin/globulin ratio (A/G Ratio) [by calculation]
Total bilirubin (Total Bili)
Urea nitrogen
Creatinine
Alkaline phosphatase (ALP)
Alanine aminotransferase (ALT)
Aspartate aminotransferase (AST)
Gamma glutamyltransferase (GGT)
Glucose
Total cholesterol (Cholesterol)
Calcium
Chloride
Phosphorus
Potassium
Sodium
Triglycerides (Triglyceride)
Bile acids [a]

( ) - Designates abbreviation used in data tables
[a] - Presented on special chemistry tables

3.2. ANATOMIC PATHOLOGY

3.2.1. MACROSCOPIC EXAMINATION

Complete *postmortem* examinations were performed on all animals euthanized *in extremis* or at the scheduled necropsy. Animals were euthanized by carbon dioxide inhalation and exsanguinated. At the time of necropsy, the following tissues and organs were collected and placed in 10% neutral-buffered formalin fixative unless otherwise noted:

Adrenals (2)
Aorta
Bone with marrow (sternebrae)
Bone marrow smear [a]
Brain
  Cerebrum (2 levels)
  Cerebellum with pons/medulla
Coagulating gland
Eyes with optic nerves (2) [c]
Gastrointestinal tract
  Esophagus
  Stomach
  Duodenum
  Jejunum
  Ileum
  Cecum
  Colon
  Rectum
Heart
Kidneys (2)
Left femur [b]
Liver (sections of 2 lobes)
Lungs (including bronchi, fixed by inflation with fixative)
Lymph nodes
  Axillary (2)
  Mandibular (2)
  Mesenteric
Ovaries (2) with oviducts
Pancreas
Peripheral nerve (sciatic)
Pituitary
Prostate
Salivary glands [mandibular (2)]
Seminal vesicles (2)
Skeletal muscle (rectus femoris)
Skin with mammary gland [d]
Spinal cord (cervical)
Spleen
Testes with epididymides (2) [e]
Thymus
Thyroids with parathyroids (2)
Trachea
Urinary bladder
Uterus [f] with cervix and vagina
Gross lesions (when possible)

[a] - Bone marrow from the right femur was collected from all F_0 animals at the scheduled necropsy and euthanized *in extremis* from all groups (with the exception of found dead and vehicle control animals euthanized *in extremis*) for the micronucleus test. Results are presented in a separate report.
[b] - Bone marrow smears from the left femur (intended for histological examination) were not placed in formalin, slides were not examined.
[c] - Fixed in Davidson's solution
[d] - For females; a corresponding section of skin was taken from the same anatomical area for males.
[e] - Fixed in Bouin's solution
[f] - Any uterus that was placed in 10% ammonium sulfide solution for detection of implantation sites was discarded and not preserved in 10% neutral-buffered formalin.

3.2.2. ORGAN WEIGHTS

The following organs were weighed from all animals at the scheduled necropsy:

Adrenals	Ovaries (with oviducts)
Brain	Spleen
Epididymides*	Testes*
Heart	Thymus
Kidneys	Thyroid with parathyroids^{+}
Liver	Uterus with vagina
Lungs	

Paired organs were weighed together. Designated (*) paired organs were weighed separately. Designated ($^{+}$) organs were weighed after fixation. Organ to final body weight and organ to brain weight ratios were calculated.

3.2.3. MICROSCOPIC EXAMINATION

Microscopic examination of routinely prepared hematoxylin-eosin stained paraffin sections was performed on all tissues collected at necropsy from all animals in the vehicle control and high-dose groups. Sections of the testes and epididymides were also stained with PAS and hematoxylin. The adrenals, kidney, liver, thymus, thyroid, and heart were examined in the low- and mid-dose groups. Stained histologic sections were examined by light microscopy and observations were entered in the WIL Toxicology Data Management System (WTDMS™) by the pathologist. A cause-of-debility determination was made for all animals that were euthanized prior to scheduled study termination. Histologic sections were of adequate size and quality for detailed evaluation, and the number of tissues examined from each treatment group was sufficient to allow detection of test substance-related histologic alterations. Histopathologic lesions were classified using standard published terminology to the extent possible. The WTDMS™ histopathology tables contain all of the recorded data and serve as the basis for this narrative report.

3.3. ABBREVIATIONS AND DEFINITIONS

The following abbreviations may apply to this report:

Interval - point in the study at which event occurred (specimen collection, necropsy, etc.)
LD - lactation day
EE - euthanized *in extremis*
SN - scheduled necropsy

3.4. DATA INTERPRETATION

In the discussion of clinical pathology parameters, values derived from the control group animals at all time points evaluated were considered as concurrent control values for purposes of constructing a 'normal' range for the present study. In addition, historical control values for this laboratory were consulted to refine data interpretation. Unless otherwise stated in this report, the 'normal' historical control range was represented by values within the WIL Research historical control reference range (the central 95% values).

In the discussion of organ weights, the indication of higher or lower mean organ weights refers to a statistically significant ($p<0.05$ or $p<0.01$ using Dunnett's test) difference between test substance-treated versus control group animals in the present study. In addition, historical control values for this laboratory were consulted to refine data interpretation.

4. RESULTS

4.1. SURVIVAL

There was one early death in a 900 mg/kg/day group female. All other animals survived until scheduled euthanasia. Female no. 81964 from the 900 mg/kg/day group was euthanized *in extremis* on lactation day 2. Gross observations included irregular white areas on all lobes of the liver, pale brain, pale pituitary, pale adrenal glands, distended stomach, and small thymus. Histologic findings included acute inflammation in the uterus, hypocellular bone marrow in the femur and sternum, contracted spleen, severe thymic lymphoid depletion, centrilobular hepatocellular hypertrophy, centrilobular to coalescing hepatocellular vacuolation, coagulation necrosis of the liver, moderate widespread tubular dilatation in the kidneys, and erosions of the glandular stomach with scattered neutrophilic infiltrate. In the kidneys, dilated tubules were observed throughout the cortex and outer medulla. Tubules were lined by attenuated epithelium and contained lightly eosinophilic granular material. The thymic lymphoid depletion and centrilobular hepatocellular hypertrophy were consistent with the test substance-related microscopic findings at the primary necropsy. The cause of debility was the acute inflammation in the uterus.

4.2. CLINICAL PATHOLOGY

For the presentation of clinical pathology results in this report, the terms “higher” or “lower” refer to comparisons between test substance-treated groups versus the concurrent control group. Indications of * and ** in the clinical pathology section refer to statistical significance at $p<0.05$ or 0.01, respectively.

4.2.1. HEMATOLOGY AND COAGULATION

4.2.1.1. CHANGES ASSOCIATED WITH TEST SUBSTANCE ADMINISTRATION

The following alterations in hematology parameters were considered to be related to test substance administration in the 900 mg/kg/day group males: red blood cell count (↓4.8%*), hemoglobin concentration (↓6.4%**), hematocrit (↓6.4%**), platelet count

(↑14.3%*), large unstained cell count (↑100.0%*), and red cell distribution width (↑9.6%**). The hemoglobin distribution width was higher in the 300 and 900 mg/kg/day group males (↑7.0%*, ↑7.4%*, respectively). All changes were of small magnitude and the red blood cell count, hemoglobin concentration, hematocrit, platelet count, large unstained cell count, and red cell distribution width were within the WIL Research historical control reference range (version 3.1).

The following alterations in hematology parameters were considered to be related to test substance administration in the 300 and 900 mg/kg/day group females: absolute white blood cell count (↑49.1%*, ↑47.4%*, respectively) and absolute lymphocyte count (↑53.9%*, ↑49.4%*, respectively). These values were within the WIL Research historical control reference range (version 3.1). A higher absolute monocyte count (↑218.2%*) was observed in the 900 mg/kg/day group females.

4.2.1.2. CHANGES UNRELATED TO TEST SUBSTANCE ADMINISTRATION

There were no other test substance-related effects on hematology or coagulation parameters. However, some statistically significant ($p<0.05$ or $p<0.01$ using Dunnett's test) differences were observed when the control and test substance-treated groups were compared. These findings included: lower activated partial thromboplastin time (APTT) in the 900 mg/kg/day group females involved a change in a direction of no known toxicologic importance. Higher mean platelet volume and higher large unstained cell count in the 300 mg/kg/day group females lacked a clear dose-related response.

Statistically significant findings that involved percentage reticulocyte or leukocyte differential counts were not itemized above, and were not considered toxicologically important because absolute cell counts are more relevant for interpretative purposes.

4.2.2. SERUM CHEMISTRY

4.2.2.1. CHANGES ASSOCIATED WITH TEST SUBSTANCE ADMINISTRATION

The following alterations in serum chemistry parameters were considered to be related to test substance administration in the 900 mg/kg/day group males: mean serum creatinine (↑33.3%**) and mean serum chloride (↓1.9%**). The change in serum chloride was of small magnitude, and the value fell within the WIL historical control reference range (Version 3.1).

The following alterations in serum chemistry parameters were considered to be related to test substance administration in the 900 mg/kg/day group females: mean serum albumin (↑9.3%*), total protein (↑6.3%*), mean serum glucose (↑13%*), mean serum cholesterol (↑29%*), and mean serum calcium (↑8.5%**). Mean serum phosphorus was higher in the 300 and 900 mg/kg/day group females (↑38.5%*, ↑41%*, respectively). The changes observed in the serum chemistry values in the 300 and 900 mg/kg/day group females were all of small magnitude, and the values were within the WIL historical control reference range (Version 3.1).

4.2.2.2. CHANGES UNRELATED TO TEST SUBSTANCE ADMINISTRATION

There were no other test substance-related effects on serum chemistry parameters. However, some other statistically significant ($p<0.05$ or $p<0.01$ using Dunnett's test) differences were observed when the control and test substance-treated groups were compared. These findings included: higher mean serum potassium in the 300 mg/kg/day group females. This finding lacked a clear dose-related response.

4.3. GROSS OBSERVATIONS

The gross necropsy observations presented in Text Table 1 were considered to be related to administration of the test substance:

Text Table 1. Toxicologically Relevant Gross Necropsy Observations

Organ	Observation	Dosage Level(s) (mg/kg/day)	Sex	Interval(s)
Kidney	pale	900	M	PN

Descriptions of test substance-related histologic alterations are discussed in Section 4.5. (Histologic Changes).

4.4. ORGAN WEIGHTS

Organ weight differences presented in Text Table 2 were considered to be associated with administration of the test substance.

Text Table 2. Toxicologically Relevant Organ Weight Changes

Parameter	Direction and magnitude of change	Dosage level (mg/kg/day)	Sex	Interval
Thyroids/Parathyroids				
Relative to body weight	↑25%**	900	M	PN
Relative to brain weight	↑11.3%*	900	M	PN
Liver				
Absolute	↑16.6%*, ↑48.1%**	300, 900	M	PN
	↑52.6%**	900	F	PN
Relative to body weight	↑20.9%**, ↑63.5%**	300, 900	M	PN
	↑21.8%**,↑65%**	300, 900	F	PN
Relative to brain weight	↑15.2%*, ↑50.8%**	300, 900	M	PN
	↑53.1%**	900	F	PN
Kidneys				
Absolute	↑17.4%**	900	M	PN
Relative to body weight	↑13.1**, ↑28.3%**	300, 900	M	PN
	↑13.4%**	900	F	PN
Relative to brain weight	↑19.3%**	900	M	PN

* = Significantly different from the control group at 0.05 using Dunnett's test
** = Significantly different from the control group at 0.01 using Dunnett's test

There were no other test substance-related effects on organ weights.

The absolute lung weights were lower in the 100, 300, and 900 mg/kg/day group females. In addition, the lung weight relative to brain weight was lower in the 900 mg/kg/day group females. These values fell within the WIL historical control database range (Version 3.1) and were not associated with any gross, microscopic, or clinical pathology changes. The lower lung weights were considered not test substance related.

The absolute uterus/vagina weights and weights relative to brain weights were lower in the 100, 300, and 900 mg/kg/day group females. All gravid animals were in lactational anestrus and undergoing uterine involution. The values fell within the WIL historical control database range (Version 3.1) and were not associated with any gross, histopathologic, or clinical pathology changes and were not considered test substance related.

Statistically significant organ weight differences in the positive control (CYC-treated) group are presented in Text Table 3.

**Text Table 3. Toxicologically Relevant Organ Weight Changes
60 mg/kg/day Cyclophosphamide Compared to Sham Control group**

Parameter	Direction and magnitude of change	Dosage level (mg/kg/day)	Sex	Interval
Adrenal glands				
Relative to body weight	↑16.7**	60	M	PN
	↑ 26.1%**	60	F	PN
Relative to brain weight	↑17.9%**	60	M	PN
Liver				
Absolute	↓17.0%*	60	F	PN
Spleen				
Absolute	↓33.3%**	60	M	PN
	↓36.6%**	60	F	PN
Relative to body weight	↓32.9%**	60	M	PN
	↓27.8%*	60	F	PN
Relative to brain weight	↓33.3%**	60	M	PN
	↓35.7%**	60	F	PN
Thymus				
Absolute	↓51.5%**	60	M	PN
Relative to body weight	↓50.6%**	60	M	PN
Relative to brain weight	↓51.2%**	60	M	PN
Brain				
Relative to body weight	↑11.8%*	60	F	PN
Kidneys				
Absolute	↓12.1%*	60	F	PN
Relative to brain weight	↑10.7%**	60	F	PN

* = Significantly different from the control group at 0.05 using two-sample t-test
** = Significantly different from the control group at 0.01 using two-sample t-test

4.5. HISTOLOGIC CHANGES

4.5.1. CHANGES ASSOCIATED WITH TEST SUBSTANCE ADMINISTRATION

Test substance-related findings occurred in all test substance-treated groups. Unique to the male rats were prominent hyaline droplets and hyaline droplet nephropathy. Cortical lymphoid depletion was observed in the thymus of the 100 and 900 mg/kg/day group

females, but was not observed in the 300 mg/kg/day group females. Epithelial hypertrophy and cytoplasmic vacuolation of the thyroid gland was observed in all test substance-treated groups. Centrilobular hepatocellular hypertrophy was observed in the 900 mg/kg/day group males and females. Cytoplasmic vacuolation of the zona fasciculata occurred in the adrenal cortex of the 900 mg/kg/day group females and the 100, 300, and 900 mg/kg/day group males.

Kidney

Hyaline droplets: Increased concentrations and aggregations of eosinophilic proteinaceous intracytoplasmic and intraluminal droplets were observed in the proximal tubules of the test substance-treated male rats.

Hyaline Droplet Nephropathy: In the 300 and 900 mg/kg/day group males, tubules in the inner stripe of the outer medulla were dilated and lined with flattened epithelium. These tubules were filled with lightly eosinophilic granular cellular debris (granular casts). Radiating arrays of tubules of the cortex contained epithelium with basophilic cytoplasm that protruded into the tubular lumen (interpreted as regeneration). The combination of granular casts and hyaline droplets is characteristic of hyaline droplet nephropathy (Hard, 2008).

Thyroids

Hypertrophy, Epithelial and Vacuolation, Cytoplasmic: Test substance-related epithelial hypertrophy and cytoplasmic vacuolation were observed. Follicle luminal diameters were decreased, and thyroid epithelial cells were large, tall columnar cells with foamy vacuolated cytoplasm.

Liver

Hypertrophy, hepatocellular centrilobular: In the 900 mg/kg/day group males and females, the centrilobular hepatocytes were larger sized, with abundant pale eosinophilic cytoplasm. The larger hepatocytes compressed and obscured the hepatic sinusoids.

Adrenal Cortex

Vacuolation, cytoplasmic: Minimal to mild increased vacuolation of the cytoplasm in the zona fasciculata was observed in the 900 mg/kg/day group females and the 100, 300, and 900 mg/kg/day group males.

Thymus

Depletion, lymphoid cortical: Decreased numbers of cortical lymphocytes with apparent increased stroma and medullary space was observed in 900 mg/kg/day group females and 1 of the 100 mg/kg/day group females, but was not observed in the 300 mg/kg/day group females.

Text Table 4. Incidence of Selected Histopathologic Findings, Scheduled Necropsy

Dosage (mg/kg/day):	Males				Females			
	0 Vehicle	100	300	900	0 Vehicle	100	300	900
Kidney [a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Droplet, hyaline	0	3	10^{++}	11^{++}	0	0	0	0
Minimal	-	3	9^{++}	9^{++}	-	-	-	-
Mild	-	0	1	2	-	-	-	-
Nephropathy, hyaline Droplet	0	0	2	9^{++}	0	0	0	0
Minimal	-	-	2	5^{+}	-	-	-	-
Mild	-	-	0	4	-	-	-	-
Thyroids [a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Hypertrophy, epithelial	0	6^{+}	9^{++}	11^{++}	0	3	4	8^{++}
Minimal	-	6^{+}	9^{++}	11^{++}	-	3	4	6^{+}
Mild	-	0	0	0	-	0	0	2
Vacuolation, cytoplasmic	0	6^{+}	9^{++}	10^{++}	0	3	4	8^{++}
Minimal	-	6^{+}	9^{++}	10^{++}	-	3	4	8^{++}
Liver[a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Hypertrophy, hepatocellular, centrilobular	0	0	0	8^{++}	0	0	0	10^{++}
Minimal	-	-	-	8^{++}	-	-	-	10^{++}
Vacuolation, hepatocellular, periportal	2	1	2	0	0	1	0	2
Minimal	1	1	2	-	-	1	-	2
Mild	1	0	0	-	-	0	-	0
Adrenal Cortex[a]	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Vacuolation, cytoplasmic	0	2	3	2	0	0	0	2
Minimal	-	2	3	2	-	-	-	1
Mild	-	-	-	0	-	-	-	1
Thymus	**12**	**12**	**12**	**12**	**9**	**12**	**10**	**10**
Depletion, lymphoid, cortex	0	0	0	0	0	1	0	5^{+}
Minimal	-	-	-	-	-	1	-	4
Mild	-	-	-	-	-	0	-	1

[a] - Number of tissues examined from each group.
[+] = Significantly different from vehicle control group at 0.05 using Fisher's Exact test.
[++] = Significantly different from vehicle control group at 0.01 using Fisher's Exact test.

4.5.2. CHANGES OF UNCERTAIN RELATIONSHIP TO TEST SUBSTANCE ADMINISTRATION

Kidney: In test substance-treated female rats, tubules in the inner stripe of the outer medulla were mineralized more often than in the control group rats (5 of 12 females in the control group, 6 of 12 females in the 100 mg/kg/day group, 9 of 12 females in the 300 mg/kg/day group and 7 of 12 females in the 900 mg/kg/day group). Mineralization at this location (often noted as the corticomedullary junction) is a common finding in rats (Greaves, 2007c). The incidence of minimal mineralization in the WIL Research historical control database (version 3.1) was 22.47% with an individual control group incidence range of 20-77.78%.

Mild coagulative necrosis was observed in the liver of one 900 mg/kg/day group female (no. 81969). The observation was characterized by multiple random foci of coagulative necrosis with subacute inflammation throughout the liver.

4.5.3. CHANGES UNRELATED TO TEST SUBSTANCE ADMINISTRATION

There were no other test substance-related histologic changes.

Minimal seminiferous tubule degeneration was observed in one 900 mg/kg/day group male. This finding was observed in the WIL Research historical control database (version 3.1) with an overall incidence of 6.90% and in individual control group incidence of 10-40%. Luminal cellular debris in the epididymis of this animal correlated with the seminiferous tubule degeneration and was considered a continuum of this finding.

Increased extramedullary hematopoiesis was observed in the spleen of one 900 mg/kg/day group female. The spleen is a common site of extramedullary hematopoiesis, the degree of which is variable. The stimuli can be nonspecific and it can occur sporadically (Greaves, 2007d). The incidence of increased extramedullary hematopoiesis in the spleen in the WIL Research historical control database (version 3.1) was 8.89% with an individual control group incidence range of 30-50%.

Minimal cardiomyopathy was observed with increased incidence in the 100, 300, and 900 mg/kg/day group males. Cardiomyopathy is a common finding in rats (Greaves, 2007b). In the WIL Research historical control database (version 3.1), the overall incidence of minimal cardiomyopathy in male rats was 11.49% (individual control group incidence ranged from 10-40%). The cardiomyopathy observed in the test substance-treated rats was similar to of lesser severity when compared to the cardiomyopathy observed in the control group rats and was not associated with any gross observations, organ weight changes, or alterations in clinical pathology parameters.

Remaining histologic changes were considered to be incidental findings or related to some aspect of experimental manipulation other than administration of the test substance. There was no test substance-related alteration in the prevalence, severity, or histologic character of those incidental tissue alterations.

5. DISCUSSION

Test substance-related findings occurred in the 100, 300, and 900 mg/kg/day group males females. Relationships were suspected between gross necropsy, organ weight, clinical pathology, and histopathology observations, as presented in Text Table 5. These proposed relationships were based on subjective interpretation rather than a statistical analysis of correlation.

Text Table 5. Correlations of Selected Observations

Necropsy	Organ Weight	Clinical Pathology	Histopathology
Kidneys – pale	↑ kidney weight	↑ serum creatinine	Droplets, hyaline Nephropathy, hyaline droplet
Liver	↑ liver weight	-	Centrilobular hepatocellular hypertrophy
Thyroids/Parathyroids	↑ thyroid/parathyroid weights	-	Epithelial hypertrophy and cytoplasmic vacuolation

- = No correlate

Unique to the male rats were prominent hyaline droplets and hyaline droplet nephropathy. While hyaline droplets are considered a normal finding in untreated male rats (Greaves 2007c), the aggregation and condensation pattern of the droplets was more prominent in the test substance-treated male rats. In addition to prominent and aggregated hyaline droplets, radiating arrays of basophilic tubules throughout the cortex, and granular casts at the inner stripe of the outer medulla comprised a constellation of observations characteristic of hyaline droplet nephropathy (Hard, 2008). The hyaline droplet nephropathy correlated to the grossly observed pale kidneys and the increased absolute and relative kidney weights as well as the increased mean serum creatinine observed in the serum chemistry. There was no microscopic correlate to the gross observation of dark red kidneys. The test substance-related renal changes are considered adverse in the rat but specific to this species and toxicologically unimportant to humans.

Cortical lymphoid depletion was observed in the thymus of the 900 mg/kg/day group females and 1 of the 100 mg/kg/day group females, but was not observed in the 300 mg/kg/day group. Thymic lymphoid depletion may be a result of pharmacologic action of the test substance but can also occur secondary to stress (Greaves, 2007d). As lymphoid depletion can be associated with stress, the histologic changes are considered non-adverse.

Epithelial hypertrophy and cytoplasmic vacuolation of the thyroid gland was observed in the test substance-treated groups and correlated to the increased relative thyroid/parathyroid weights in the 900 mg/kg/day group males. Follicular epithelial hypertrophy can occur with enzyme induction and increased hepatic clearance of thyroxine (Curran, 1991). The changes in the thyroid gland are not considered an adverse effect of test substance and are considered to be specific to the rat with no toxicologic significance to humans.

Centrilobular hepatocellular hypertrophy was observed in the 900 mg/kg/day group males and females. Centrilobular hepatocellular hypertrophy correlated to the increased

absolute and relative liver weights. Centrilobular hepatocellular hypertrophy and higher liver weights were consistent with hepatocellular enzyme induction (Greaves, 2007e). This change is adaptive and non-adverse.

Cytoplasmic vacuolation of the zona fasciculata occurred in the adrenal cortex of the 100, 300, and 900 mg/kg/day group males and the 900 mg/kg/day group females. Cytoplasmic vacuolation can occur spontaneously (Frith *et al*., 2000) or as a result of pharmacologic effects (Greaves, 2007a). In the WIL Research historical control database (version 3.1), the overall incidence of minimal cytoplasmic vacuolation in age-matched male rats was 1.09% with an individual control group incidence of 20%. In age-matched females, the overall incidence of this finding was 2.35% with an individual control group incidence of 40%. Cytoplasmic vacuolation can be associated with stress, and the histologic changes are considered non-adverse.

The positive control group (60 mg/kg/day CYC) was not examined histologically.

6. CONCLUSIONS

The objective of this study was to evaluate the potential toxic effects of Naphthenic Acid when administered to rats for 28 days and to evaluate the potential of the test substance to affect male and female reproductive performance including gonadal function, mating behavior, conception, parturition and early postnatal development. There were no test substance-related effects on survival.

Test substance-related findings were observed in the 100, 300, and 900 mg/kg/day groups. Gross observations were noted in the kidneys (pale kidneys). Test substance-related organ weight changes were higher liver weights, higher kidney weights, and higher thyroids/parathyroids weights. Test substance-related microscopic observations were observed in the liver (centrilobular hepatocellular hypertrophy), kidneys (hyaline droplets and hyaline droplet nephropathy), thyroids/parathyroids (epithelial hypertrophy and cytoplasmic vacuolation), thymus (lymphoid cortical

depletion), and adrenal cortex (cytoplasmic vacuolation). The test substance-related changes in the liver, thyroids, thymus, and adrenals were considered non-adverse. The centrilobular hypertrophy in the liver was consistent with enzyme induction. The epithelial hypertrophy and cytoplasmic vacuolation in the thyroid was considered adaptive and the lymphoid cortical depletion in the thymus and adrenal cortical vacuolation are considered a result of stress.

Test substance-related alterations in hematology and coagulation were of small magnitude, were within the WIL Research historical control database (version 3.1), and were considered toxicologically unimportant and non-adverse. All test substance-related serum chemistry alterations, except the serum creatinine, were of small magnitude and fell within the WIL Research historical control database reference range (version 3.1), and likewise, were toxicologically unimportant and non-adverse.

The gross observation of pale kidneys, higher absolute and relative kidney weights, and the serum chemistry finding of higher mean serum creatinine correlated to hyaline droplet nephropathy in the 900 mg/kg/day group males. The test substance-related renal changes are considered adverse in the rat but specific to this species and toxicologically unimportant to humans.

7. REFERENCES

Curran, P.G.; De Groot, L.J. The effect of hepatic enzyme-inducing drugs on thyroid hormones and thyroid gland. *Endocrine Reviews* **1991**, *12*, 135-150.

Frith, C.H.; Botts, S; Jokinen, M.P.; Eighmy, J.J.; Hailey, J.R.; Morgan, S.J.; Chandra, M. Non-proliferative lesions of the endocrine system in rats. In *Guides for Toxicologic Pathology.* **2000**.

Greaves, P. Endocrine Glands. In *Histopathology of Preclinical Toxicity Studies*. 3rd.; Associated Press: New York, NY **2007a**, 800-801

Greaves, P. Cardiovascular System. In *Histopathology of Preclinical Toxicity Studies.* 3rd.; Associated Press: New York, NY **2007b**, 276-277

Greaves, P. Urinary Tract. In *Histopathology of Preclinical Toxicity Studies.* 3rd Ed.; Associated Press: New York, NY **2007c**, 600-601, 615

Greaves, P. Haematopoietic and Lymphatic Systems. In *Histopathology of Preclinical Toxicity Studies*. 3rd Edition; Associated Press: New York, NY **2007d**, 118, 126

Greaves, P. Liver and Pancreas. In Histopathology of Preclinical Toxicity Studies. 3rd Ed.; Associated Press: New York, NY **2007e**, 466-475

Hard, G.C. Some aids to histological recognition of hyaline droplet nephropathy in ninety-day toxicity studies. *Toxicologic Pathology* **2008**, *36*, 1014-1017.

8. REPORT SUBMISSION

WIL-402011 Pathology Report

Report Submitted By:

[redacted]

Study Pathologist

25 July 2012
Date

APPENDIX J

Historical Control Data for Micronucleus Evaluation
(Midwest BioResearch,LLC)

HISTORICAL CONTROL RESULTS FOR 2007 – 2008

IN VIVO BONE MARROW MICRONUCLEUS TEST IN RATS

REPORT

Midwest BioResearch Study Number: MBR09-117

Author: [redacted]

TESTING FACILITY

MIDWEST BIORESEARCH, LLC
8025 LAMON AVENUE
SKOKIE, ILLINOIS 60077

1.0 COMPLIANCE STATEMENT

This analysis was conducted in compliance with Food and Drug Administration (FDA) Good Laboratory Practice (GLP) regulations 21 CFR, Part 58; and in general compliance with the International Conference on Harmonisation (ICH) guidelines S2A and S2B and with the Organisation for Economic Co-operation and Development (OECD) guideline number 474.

2.0 COMPLIANCE AND REPORT APPROVAL SIGNATURES

[redacted] Date 30 Jan 2009

Author
Midwest BioResearch, LLC

[redacted] Date 30 Jan 2009

President
Midwest BioResearch, LLC

3.0 QUALITY ASSURANCE STATEMENT

Study Title: Historical Control Results for 2007 – 2008 *In Vivo* Bone Marrow Micronucleus Test in Rats

Study No.: MBR09-117

In accordance with Midwest BioResearch policies and Quality Assurance procedures for Good Laboratory Practices (GLP), the conduct of this study has been inspected as follows:

Dates of Inspection/Audit	Critical Phase Inspected	Date(s) Reported to	
		Author	Management
15, 16-Jan-2009	Raw Data and Report	21-Jan-2009	22-Jan-2009

[redacted] 30 Jan 2009
Date

[redacted]
Director, Quality Assurance
Midwest BioResearch, LLC

4.0 ABSTRACT

This report is an analysis of data from all GLP *in vivo* bone marrow micronucleus studies in rats finalized at Midwest Bioresearch, LLC, from 2007 through 2008. The purpose of this report is to establish historical control data ranges for GLP assays and to illustrate typical results obtained from this analysis.

Vehicle and/or negative control data from all GLP *in vivo* rat bone marrow micronucleus studies (24 and 48 hours) were pooled and analyzed. Positive control data were similarly treated. Data and analyses, including mean, standard deviations and other statistical results, are summarized in this report. Method information typically employed in the performance of this assay (and in accordance with MBR SOPs) is presented.

Historical control ranges to be used to evaluate the acceptability of vehicle and positive control data from future GLP *in vivo* rat bone marrow micronucleus studies are presented in Table 1, below.

Table 1. Historical Control Data for Rat Bone Marrow Micronucleus from GLP Studies Finalized from 2007 through 2008

Vehicle Control

	Ratio of PCE/Total Erythrocytes		%MN PCEs	
	Males	**Females**	**Males**	**Females**
Mean	0.55	0.55	0.12	0.12
SD	0.10	0.12	0.11	0.09
Range	0.29-0.78	0.24-0.76	0.00-0.40	0.00-0.35

Positive Control (Cyclophosphamide, 60 mg/kg)

	Ratio of PCE/Total Erythrocytes		%MN PCEs	
	Males	**Females**	**Males**	**Females**
Mean	0.35	0.37	2.90	1.27
SD	0.13	0.12	1.95	0.63
Range	0.18-0.71	0.19-0.66	0.65-8.40	0.40-2.70

5.0 TABLE OF CONTENTS

1.0 COMPLIANCE STATEMENT 2
2.0 COMPLIANCE AND REPORT APPROVAL SIGNATURES 2
3.0 QUALITY ASSURANCE STATEMENT 3
4.0 ABSTRACT 4
5.0 TABLE OF CONTENTS 5
6.0 INTRODUCTION 7
7.0 MATERIALS AND METHODS 7
7.1 Test Article 7
7.1.1 Vehicle Control Articles 7
7.1.2 Positive Control Article 7
7.2 Dose Administration—Frequency, Route and Dose Volume 7
8.0 TEST SYSTEM 8
8.1 Species, Age, Weight and Sex 8
8.1.1 Identification 8
8.1.2 Randomization and Assignment to Dosage Groups 8
8.1.3 Housing and Diet 8
8.2 Species Rationale 8
9.0 EXPERIMENTAL METHODS 9
9.1 In-Life Observations 10
9.2 Bone Marrow Collection 10
9.3 Terminal Sacrifice 10
9.4 Processing and Scoring of Bone Marrow Slides 10
9.5 Micronuclei Analysis 10
9.6 Statistical Analysis 11
10.0 DATA ACQUISTION AND ELECTRONIC RECORDS 11
11.0 MAINTENANCE OF RAW DATA AND RECORDS 11
12.0 RESULTS 11
13.0 CONCLUSION 11
14.0 REFERENCES 12

TABLES

Table 1. Historical Control Data for Rat Bone Marrow Micronucleus from GLP Studies Conducted from 2007 through 2008 4
Table 2. Study Design: Vehicle Controls 9

APPENDIX

APPENDIX 1. INDIVIDUAL DATA 13

APPENDIX TABLES

Appendix 1, Table 1. Individual Data – Vehicle Control (2007-2008) 13
Appendix 1, Table 2. Individual Data – Positive Control (2007-2008) 15

6.0 INTRODUCTION

The *in vivo* micronucleus test is an assay which detects damage to chromosomes or the mitotic apparatus (Schmid, 1975). Micronuclei are small structures consisting of acentric chromosome fragments or intact whole chromosomes that lag behind at the anaphase stage of cell division. They are readily visible in both polychromatic (PCE) and normochromatic (NCE) erythrocytes. An increase in the incidence of micronucleated PCEs in treated animals is an indication that the test article has affected the chromosomal integrity of the progenitor cells.

This report analyzed the vehicle and positive control data obtained from GLP assays finalized at Midwest Bioresearch, LLC (Skokie, IL) from 2007 through 2008 for the purpose of establishing historical control and ranges for evaluating the acceptability of data obtained in future studies.

7.0 MATERIALS AND METHODS

7.1 Test Article

7.1.1 Vehicle Control Articles

Vehicle control articles used in the studies included in this analysis were a) deionized water, b) 20% hydroxypropyl-β-cyclodextrin in 10 mM aqueous citric acid, c) 0.5% carboxymethylcellulose, d) phosphate buffered saline, e) corn oil, and f) 10% hydroxypropyl-β-cyclodextrin (w/w) / 0.1 M sodium bicarbonate (pH 9.5 ± 0.3).

Data for all vehicle controls (24 and/or 48 hours) were pooled for analysis.

7.1.2 Positive Control Article

The positive control article used in all studies was cyclophosphamide monohydrate (CP; [CAS No. 6055-19-2]).

7.2 Dose Administration—Frequency, Route and Dose Volume

Vehicles controls were administered according to the same dosing regimen as each respective test article. In each study, the positive control (cyclophosphamide) was administered as a single dose (60 mg/kg) by oral gavage at a dose volume of 10 mL/kg on the final day of test article dosing.

The specific study designs are presented in Table 2.

8.0 TEST SYSTEM

8.1 Species, Age, Weight and Sex

Male and female (nulliparous, nongravid) Sprague-Dawley [Crl:CD®(SD) IGS BR] rats from Charles River Laboratories, 7-10 weeks of age and weighing 150-361 g at dosing, were used in the studies. Animals were acclimated at least for five days.

8.1.1 Identification

Each animal was identified with unique identification number. Cage cards displaying the study number, animal number, group and sex were affixed to each cage.

8.1.2 Randomization and Assignment to Dosage Groups

Healthy animals with body weights within ± 20% of the group mean weight were selected for inclusion in the study. Rats were assigned to groups using an in-house computer randomization program based on pretreatment body weight.

8.1.3 Housing and Diet

All housing and care of the animals generally conformed to the Guide for the Care and Use of Laboratory Animals (NIH Publication No. 96-03, 1996).

8.2 Species Rationale

Sprague-Dawley rats have been shown to be sensitive to the toxic effects of a variety of drugs and chemicals and there is a large historical biological database in the published literature and at the testing facility. Therefore, they are the preferred species for bone marrow micronucleus studies, particularly when used as the rodent species for general toxicity testing.

9.0 EXPERIMENTAL METHODS

Study designs are summarized below.

Table 2. Study Design: Vehicle Controls

Study No.	Treatment	Dose Route	Dosing Duration	Dosing Frequency	Dose Volume (mL/kg)	Animals Sacrificed 24 Hours after last dosing		Animals Sacrificed 48 Hours after last dosing	
						Males	Females	**Males**	**Females**
MBR06-217	Deionized Water	Oral gavage	2 Days	Once daily	20	6*	NA	NA	NA
MBR07-257	20% HPβCD in 10 mM aqueous citric acid	Oral gavage	Single Dose	Single Dose	20	6*	6*	6*	6*
MBR07-387	0.5% CMC	Oral gavage	Single Dose	Single Dose	10	6*	6*	6*	6*
MBR08-117	Phosphate Buffered Saline	Oral gavage	3 Days	Once Daily	10	6*	6*	NA	NA
MBR08-126	10% HPβCD (w/w) / 0.1M sodium bicarbonate (pH 9.5±0.3)	Oral gavage	Single Dose	Single Dose	10	6*	6*	6*	6*
MBR08-249	100% Corn Oil	Oral gavage	3 Days	Once daily	10	6*	6*	NA	NA

*Five of the six animals were utilized for bone marrow collection.
Abbreviations: HPβCD – Hydroxypropyl β-cyclodextrin; CMC – Carboxymethylcellulose; NA – Not applicable

Positive control treatment was standard for all studies: animals were administered cyclophosphamide (6 mg/mL) in water once by oral gavage at a dose volume of 10 mL/kg for a dose of 60 mg/kg. Twenty-four hours later, animals were terminated and bone marrow was collected.

9.1 In-Life Observations

Animals were checked for survival, moribundity or other overt clinical signs of toxicity during the treatment period and prior to termination. Body weights were recorded prior to treatment and at termination.

9.2 Bone Marrow Collection

Bone marrow was collected from anesthetized animals (five/sex/group in the main study animals) at approximately 24 hours, or 24 and 48 hours following the single or last dose, study specific (24 hours following a single dose for positive control animals). Using a syringe containing heat-inactivated fetal bovine serum, the bone marrow was flushed from one femur and combined in a centrifuge tube (one tube per animal). After centrifugation to pellet the cells and remove excess fetal bovine serum, the cells were resuspended in fetal bovine serum and dropped onto clean slides. Two slides per animal were prepared. Slides were air-dried, fixed for twenty minutes in methanol and then transferred to MBR for staining and evaluation.

9.3 Terminal Sacrifice

Animals were euthanized with CO_2 and discarded without necropsy after bone marrow harvest.

9.4 Processing and Scoring of Bone Marrow Slides

The coded slides were stained with acridine orange solution then arranged in numerical order prior to microscopic analysis. Two separate counts were made for each slide: 1) a total of 1000 erythrocytes, (both PCEs and NCEs) per animal were counted and PCE/total erythrocytes determined; and 2) number of micronucleated PCEs from a total of 2000 PCEs were scored per animal.

9.5 Micronuclei Analysis

Micronuclei are bright yellow or green and generally round, although they are occasionally almond or ring-shaped. Micronuclei have sharp borders and are generally between $1/20^{th}$ and $1/5^{th}$ of the size of a PCE. Cells are scored as micronucleated whether they have one micronucleus or >1, which can sometimes occur. Staining with acridine orange permits the differentiation by color of PCEs (orange), and NCEs, (grayish-green).

9.6 Statistical Analysis

The mean and standard deviation was calculated for this analysis

Mean counts and the standard deviation were calculated as follows:

Mean = $\frac{\sum x_n}{n}$ Where x = the individual values and n = the number of values.

Standard Deviation = **SD** = $\sqrt{\frac{\sum (x-\bar{x})^2}{n-1}}$

10.0 DATA ACQUISTION AND ELECTRONIC RECORDS

Microsoft Excel 2003 (Redmond, WA) was used to prepare all tables.

11.0 MAINTENANCE OF RAW DATA AND RECORDS

All raw data and reports are maintained by MBR accordance with applicable SOPs

12.0 RESULTS

Mean values for the pooled vehicle and positive controls are presented in Table 1. Individual values are presented in Appendix 1, Tables 1 and 2.

13.0 CONCLUSION

Vehicle and positive control data from GLP *in vivo* Rat Bone Marrow Micronucleus assays conducted by MBR from 2007 through 2008 were analyzed to prepare historical control tables and to demonstrate results obtained by this laboratory. Data presented in the summary tables will be used to evaluate the acceptability of vehicle and positive control data from future *in vivo* rat bone marrow micronucleus assays.

14.0 REFERENCES

Code of Federal Regulations, Title 21, Volume 1, Part 58. Good Laboratory Practice for Nonclinical Laboratory Studies, revised April 1, 2007.

Guide for the Care and Use of Laboratory Animals, DHHS Publication No. (NIH) 96-03, 1996.

International Conference on Harmonisation (ICH). Guideline for Industry: Specific Aspects of Regulatory Genotoxicity Tests for Pharmaceuticals. ICH Harmonised Tripartite Guideline S2A, April, 1996.

International Conference on Harmonisation (ICH). Guidance for Industry: S2BGenotoxicity: A Standard Battery for Genotoxicity Testing of Pharmaceuticals. ICH Harmonised Tripartite Guideline S2B, July, 1997.

Organisation for Economic Co-operation and Development (OECD) Guideline for the Testing of Chemicals, Section: Health Effects, Subsection 474. Updated and adopted 21 July 1997.

Schmid W. The micronucleus test. *Mutation Research* 1975 Feb;31(1):9-15.

Heddle JA, Hite M, Kirkhart B, Mavournin K, MacGregor JT, Newell GW and Salamone MF. The induction of micronuclei as a measure of genotoxicity. A report of the U.S. Environmental Protection Agency Gene-Tox Program. *Mutation Research* 1983 Sep;123(1):61-118.

.

APPENDIX 1. INDIVIDUAL DATA

Appendix 1, Table 1. Individual Data – Vehicle Control (2007-2008)

Studies	Animal No. (Males)	% MN PCEs	RATIO PCE/TE	Studies	Animal No. (Females)	% MN PCEs	RATIO PCE/TE
MBR06-217	A6433	0.05	0.62	MBR06-217	NA	NA	NA
MBR06-217	A6438	0.15	0.56	MBR06-217	NA	NA	NA
MBR06-217	A6452	0.35	0.52	MBR06-217	NA	NA	NA
MBR06-217	A6446	0.05	0.77	MBR06-217	NA	NA	NA
MBR06-217	A6443	0.10	0.67	MBR06-217	NA	NA	NA
MBR07-257	5462	0.40	0.46	MBR07-257	5516	0.20	0.42
MBR07-257	5463	0.35	0.50	MBR07-257	5517	0.35	0.52
MBR07-257	5464	0.15	0.66	MBR07-257	5518	0.00	0.61
MBR07-257	5465	0.05	0.56	MBR07-257	5519	0.05	0.58
MBR07-257	5466	0.05	0.62	MBR07-257	5520	0.15	0.39
MBR07-257	5468	0.05	0.47	MBR07-257	5522	0.10	0.58
MBR07-257	5469	0.40	0.44	MBR07-257	5523	0.05	0.53
MBR07-257	5470	0.05	0.55	MBR07-257	5524	0.15	0.57
MBR07-257	5471	0.05	0.44	MBR07-257	5525	0.05	0.63
MBR07-257	5472	0.10	0.44	MBR07-257	5526	0.35	0.49
MBR07-387	1	0.15	0.57	MBR07-387	67	0.15	0.54
MBR07-387	2	0.05	0.29	MBR07-387	68	0.05	0.30
MBR07-387	3	0.05	0.43	MBR07-387	69	0.05	0.43
MBR07-387	4	0.10	0.37	MBR07-387	70	0.05	0.51
MBR07-387	5	0.05	0.41	MBR07-387	71	0.20	0.49
MBR07-387	7	0.05	0.56	MBR07-387	73	0.10	0.52
MBR07-387	8	0.05	0.54	MBR07-387	74	0.15	0.53
MBR07-387	9	0.20	0.54	MBR07-387	75	0.15	0.41
MBR07-387	10	0.05	0.45	MBR07-387	76	0.05	0.54
MBR07-387	11	0.00	0.50	MBR07-387	77	0.10	0.50

Abbreviations: MN PCEs – Micronucleated polychromatic erythrocytes; NA – Not applicable; NCEs – Normochromatic Erythrocytes; TE – Total erythrocytes (PCEs + NCEs).

Appendix 1, Table 1. Individual Data – Vehicle Control (2007-2008) (Cont.)

Studies	Animal No. (Males)	% MN PCEs	RATIO PCE/TE	Studies	Animal No. (Females)	% MN PCEs	RATIO PCE/TE
MBR08-117	301	0.05	0.61	MBR08-117	331	0.15	0.54
MBR08-117	302	0.15	0.46	MBR08-117	332	0.05	0.24
MBR08-117	303	0.00	0.51	MBR08-117	333	0.05	0.75
MBR08-117	304	0.05	0.54	MBR08-117	334	0.20	0.49
MBR08-117	305	0.05	0.58	MBR08-117	335	0.05	0.64
MBR08-126	1	0.05	0.66	MBR08-126	37	0.00	0.75
MBR08-126	2	0.25	0.78	MBR08-126	38	0.05	0.61
MBR08-126	3	0.10	0.72	MBR08-126	39	0.10	0.38
MBR08-126	4	0.15	0.65	MBR08-126	40	0.15	0.65
MBR08-126	5	0.05	0.51	MBR08-126	41	0.05	0.52
MBR08-126	703	0.05	0.49	MBR08-126	727	0.10	0.54
MBR08-126	704	0.15	0.43	MBR08-126	728	0.00	0.68
MBR08-126	705	0.00	0.66	MBR08-126	729	0.05	0.60
MBR08-126	706	0.30	0.56	MBR08-126	730	0.15	0.71
MBR08-126	707	0.10	0.51	MBR08-126	731	0.05	0.76
MBR08-249	101	0.20	0.63	MBR08-249	125	0.25	0.50
MBR08-249	102	0.20	0.60	MBR08-249	126	0.05	0.54
MBR08-249	103	0.25	0.58	MBR08-249	127	0.20	0.73
MBR08-249	104	0.10	0.64	MBR08-249	128	0.20	0.61
MBR08-249	105	0.00	0.58	MBR08-249	129	0.30	0.55

Abbreviations: MN PCEs – Micronucleated Polychromatic erythrocytes; NCEs – Normochromatic Erythrocytes; TE – Total erythrocytes (PCEs + NCEs).

Appendix 1, Table 2. Individual Data – Positive Control (2007-2008)

Studies	Animal No. (Males)	% MN PCEs	RATIO PCE/TE	Studies	Animal No. (Females)	% MN PCEs	RATIO PCE/TE
MBR06-217	A6432	6.75	0.37	MBR06-217	NA	NA	NA
MBR06-217	A6434	3.20	0.25	MBR06-217	NA	NA	NA
MBR06-217	A6437	4.55	0.25	MBR06-217	NA	NA	NA
MBR06-217	A6444	7.00	0.52	MBR06-217	NA	NA	NA
MBR06-217	A6450	2.95	0.32	MBR06-217	NA	NA	NA
MBR07-257	5474	2.45	0.18	MBR07-257	5528	1.55	0.33
MBR07-257	5475	0.95	0.44	MBR07-257	5529	0.45	0.24
MBR07-257	5476	1.05	0.19	MBR07-257	5530	2.70	0.40
MBR07-257	5477	2.35	0.30	MBR07-257	5531	1.00	0.36
MBR07-257	5478	1.15	0.51	MBR07-257	5532	1.30	0.32
MBR07-387	13	0.75	0.29	MBR07-387	79	0.65	0.38
MBR07-387	14	1.35	0.38	MBR07-387	80	0.70	0.28
MBR07-387	15	0.75	0.27	MBR07-387	81	0.75	0.24
MBR07-387	16	1.45	0.23	MBR07-387	82	1.20	0.30
MBR07-387	17	0.65	0.33	MBR07-387	83	0.90	0.34
MBR08-117	307	2.10	0.26	MBR08-117	337	0.40	0.19
MBR08-117	308	2.60	0.23	MBR08-117	338	2.35	0.37
MBR08-117	309	2.40	0.46	MBR08-117	339	1.75	0.41
MBR08-117	310	2.40	0.27	MBR08-117	340	2.30	0.28
MBR08-117	311	3.25	0.40	MBR08-117	341	2.15	0.49
MBR08-126	73	8.40	0.68	MBR08-126	79	1.15	0.66
MBR08-126	74	2.60	0.30	MBR08-126	80	0.95	0.58
MBR08-126	75	5.50	0.71	MBR08-126	81	0.60	0.27
MBR08-126	76	2.95	0.36	MBR08-126	82	1.00	0.32
MBR08-126	77	3.80	0.32	MBR08-126	83	1.35	0.65

Abbreviations: MN PCEs – Micronucleated polychromatic erythrocytes; NA – Not applicable; NCEs – Normochromatic Erythrocytes; TE – Total erythrocytes (PCEs + NCEs).

Appendix 1, Table 2. Individual Data – Positive Control (2007-2008) (Cont.)

Studies	Animal No. (Males)	% MN PCEs	RATIO PCE/TE	Studies	Animal No. (Females)	% MN PCEs	RATIO PCE/TE
MBR08-249	149	4.00	0.51	MBR08-249	155	1.00	0.38
MBR08-249	150	2.75	0.36	MBR08-249	156	2.15	0.37
MBR08-249	151	0.85	0.20	MBR08-249	157	0.90	0.25
MBR08-249	152	3.95	0.30	MBR08-249	158	1.10	0.47
MBR08-249	153	2.00	0.39	MBR08-249	159	1.40	0.40

Abbreviations: MN PCEs – Micronucleated Polychromatic erythrocytes; NCEs – Normochromatic Erythrocytes; TE – Total erythrocytes (PCEs + NCEs).

APPENDIX K

Micronucleus Assay Report (Midwest BioResearch, LLC)

BONE MARROW MICRONUCLEUS TEST IN RATS

CONTRIBUTING SCIENTIST REPORT

Midwest BioResearch Study Number: MBR10-405

WIL Research Study Number: WIL-402011

Principal Investigator: Melissa Wells, B.S.

COMPLIANCE STATEMENT

This study was conducted in compliance with US Environmental Protection Agency (EPA) TSCA (40 CFR Part 792) and the Organisation for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practice C(97)186 (Final). This study was in general accordance with the OECD Guideline Number 474; and with the International Conference on Harmonisation (ICH) Guidelines S2A and S2B. The study was also performed according to the protocol and any amendments and Midwest BioResearch SOPs. There were no known circumstances or errors that affected the quality or integrity of the analyses. The Principal Investigator certifies that the results presented accurately represent the raw data.

COMPLIANCE APPROVAL SIGNATURES

[redacted] Date 10 Jul 2012

Principal Investigator
Midwest BioResearch, LLC

[redacted] Date 10-Jul-2012

Director, Skokie Operations, Archivist
Midwest BioResearch, LLC

INTRODUCTION

This report summarizes the results of the analysis of rat bone marrow samples collected in the study "A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats" (WIL Research Laboratories Study No. WIL-402011). The objective was to assess the potential of Naphthenic Acid to induce micronuclei in polychromatic erythrocytes (PCEs) and normochromatic erythrocytes (NCEs) in rat bone marrow following treatment once daily for at least 14 days prior to mating and continuing throughout mating for a minimum of 28 days for males and once daily for 14 days prior to mating, throughout mating and continuing until one day prior to termination (lactation day 4 for females that deliver, post-mating day 25 or post-cohabitation day 25 for females that do not deliver). This assay evaluates compounds for *in vivo* clastogenic activity and/or disruption of the mitotoic apparatus.

The in-life phase of the study was conducted at WIL Research Laboratories, LLC (WIL) in Ashland, OH (test facility). Analysis of bone marrow slides was conducted at Midwest BioResearch, LLC (MBR, a subsidiary of WIL Research), 8025 Lamon Ave., Skokie, IL (test site). Slide analysis was initiated on 23-Nov-2010 and completed on 20-Dec-2010.

STUDY DESIGN

The vehicle (corn oil) and Naphthenic Acid were administered orally via gavage once daily for at least 14 days prior to mating and continuing throughout mating for a minimum of 28 days to male Crl:CD(SD) rats and once daily for 14 days prior to mating, throughout mating and continuing until one day prior to termination (lactation day 4 for females that deliver, post-mating day 25 or post-cohabitation day 25 for females that do not deliver) to female Crl:CD(SD) rats with the first day of dosing defined as Study Day 0. The positive control article (cyclophosphamide; lot number to be included in the study records at WIL) was administered orally via gavage as a single dose. Bone marrow was harvested approximately 24 hours after the final dose.

TREATMENT GROUPS

Group	Treatment	Dose Level (mg/kg/day)	Dose Concentration (mg/mL)	Dose Volume (mL/kg)	Animals with Bone Marrow Harvested 24 hours After Final Dosing	
					Males	Females
1	Sham	0	0	0	5	5
2	Vehicle	0	0	10	5	5
3	Naphthenic Acid	100	10	10	5	5
4	Naphthenic Acid	300	30	10	5	5
5	Naphthenic Acid	900	90	10	5	5
6	Positive	60	6	10	5	5

MICRONUCLEI ANALYSIS

Prior to analysis, the coded slides were stained with acridine orange solution. Three separate counts were made for each slide: 1) a total of 1000 erythrocytes, (both polychromatic erythrocytes (PCEs) and normochromatic erythrocytes (NCEs) per animal were counted and PCE/total erythrocytes (TE) determined; 2) number of micronucleated PCEs from a total of 2000 PCEs were scored per animal; and 3) number of micronucleated NCEs from a total of 2000 NCEs were scored per animal. Micronucleated PCE, micronucleated NCE, and PCE:TE ratio results were compared across groups for the test article and vehicle treatments, the sham control and vehicle treatments, and for the positive control and vehicle treatments using analysis of variance (ANOVA) (Snedecor and Cochran, 1980) with statistical significance set at a 95% confidence level ($p \leq 0.05$). A statistical difference ($p \leq 0.05$) observed in the ANOVA, was followed by a comparison of the vehicle control group to each test article treated group by Dunnett's test (Dunnett, 1964).

DATA AND RECORDS

All data were recorded manually and transcribed into Excel 2003 (Microsoft Corp., Redmond, WA) for table preparation and data calculations. KaleidaGraph version 4.03 (Synergy Software; Reading, PA) was used to conduct statistical analysis of PCE:TE data, percent micronucleated PCE data, and percent micronucleated NCE data for this bone marrow micronucleus study.

The slides and all data and reports generated at MBR will be shipped to WIL Research Laboratories, LLC (to the attention of the Study Director) upon finalization of the MBR Contributing Scientist Report.

PERSONNEL

Principal Investigator: [redacted]
Study Scientist:
Management:
Study Director:

RESULTS

Naphthenic Acid did not produce a statistically significant ($p \leq 0.05$) increase in the mean percentage of micronucleated polychromatic erythrocytes (%MN-PCEs) or in the mean percentage of micronucleated normochromatic erythrocytes (%MN-NCEs) compared to the vehicle control. In addition, Naphthenic Acid did not produce a statistically significant change in the mean ratio of polychromatic to total erythrocytes (PCE:TE ratio) relative to the vehicle control. Severe cytotoxicity (PCE:TE ratio < 20% of the vehicle control) was observed in one female rat at 900 mg/kg/day (Animal# 81964); therefore this animal was excluded from the calculation of means and statistics. The group mean values for both %MN-PCEs and PCE:TE ratios for the vehicle and positive control groups were within the values previously obtained by Midwest BioResearch (Report MBR09-117).

Naphthenic Acid met the criteria for a negative response for the induction of bone marrow micronuclei under the conditions of this assay.

INDIVIDUAL AND MEAN DATA

Male, Micronuclei Analysis

TREATMENT	ANIMAL No.	MN PCEs/ 2000 PCEs	% MN PCEs	MN NCEs/ 2000 NCEs	% MN NCEs
Vehicle	81996	1	0.05	0	0.00
	81997	0	0.00	0	0.00
	81998	2	0.10	1	0.05
	82020	4	0.20	1	0.05
	82025	1	0.05	1	0.05
Mean ± SD			**0.08 ± 0.08**		**0.03 ± 0.03**
Sham	81983	2	0.10	0	0.00
	81990	0	0.00	0	0.00
	82004	1	0.05	0	0.00
	82012	2	0.10	2	0.10
	82017	1	0.05	1	0.05
Mean ± SD			**0.06 ± 0.04**		**0.03 ± 0.04**
Naphthenic Acid (100 mg/kg/day)	81994	0	0.00	0	0.00
	82001	3	0.15	0	0.00
	82003	2	0.10	1	0.05
	82011	0	0.00	0	0.00
	82022	2	0.10	0	0.00
Mean ± SD			**0.07 ± 0.07**		**0.01 ± 0.02**
Naphthenic Acid (300 mg/kg/day)	81993	1	0.05	0	0.00
	81995	0	0.00	0	0.00
	82013	2	0.10	1	0.05
	82023	1	0.05	2	0.10
	82031	0	0.00	0	0.00
Mean ± SD			**0.04 ± 0.04**		**0.03 ± 0.04**
Naphthenic Acid (900 mg/kg/day)	82006	0	0.00	0	0.00
	82010	2	0.10	1	0.05
	82018	3	0.15	1	0.05
	82029	0	0.00	0	0.00
	82030	3	0.15	3	0.15
Mean ± SD			**0.08 ± 0.08**		**0.05 ± 0.06**
Cyclophosphamide (60 mg/kg/day)	81985	28	1.40	2	0.10
	81992	28	1.40	4	0.20
	82008	22	1.10	0	0.00
	82026	23	1.15	4	0.20
	82033	27	1.35	3	0.15
Mean ± SD			**1.28 ± 0.14***		**0.13 ± 0.08***

MN = Micronucleated
TE = Total erythrocytes (PCE + NCE)
Vehicle = Corn Oil
NCE = Normochromatic Erythrocyte
PCE = Polychromatic Erythrocyte
*Statistically different than vehicle control $p \leq 0.05$

Mean = $\frac{\sum x_n}{n}$ Where x = the individual values; n = the number of values

SD = Standard Deviation = $\sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$

Female, Micronuclei Analysis

TREATMENT	ANIMAL No.	MN PCEs/ 2000 PCEs	% MN PCEs	MN NCEs/ 2000 NCEs	% MN NCEs
Vehicle	81939	0	0.00	0	0.00
	81942	3	0.15	1	0.05
	81958	5	0.25	1	0.05
	81975	0	0.00	1	0.05
	81979	0	0.00	1	0.05
Mean ± SD			**0.08 ± 0.12**		**0.04 ± 0.02**
Sham	81924	0	0.00	0	0.00
	81952	3	0.15	1	0.05
	81963	0	0.00	0	0.00
	81940	2	0.10	0	0.00
	81944	3	0.15	1	0.05
Mean ± SD			**0.08 ± 0.08**		**0.02 ± 0.03**
Naphthenic Acid (100 mg/kg/day)	81930	0	0.00	0	0.00
	81941	1	0.05	3	0.15
	81960	2	0.10	3	0.15
	81978	1	0.05	1	0.05
	81916	0	0.00	0	0.00
Mean ± SD			**0.04 ± 0.04**		**0.07 ± 0.08**
Naphthenic Acid (300 mg/kg/day)	81959	4	0.20	2	0.10
	81974	3	0.15	1	0.05
	81931	3	0.15	0	0.00
	81934	2	0.10	0	0.00
	81943	0	0.00	0	0.00
Mean ± SD			**0.12 ± 0.08**		**0.03 ± 0.04**
Naphthenic Acid (900 mg/kg/day)	81951	0	0.00	0	0.00
	81964 [a]	0	0.00	2	0.10
	81955	2	0.10	2	0.10
	81969	2	0.10	1	0.05
	81973	1	0.05	0	0.00
Mean ± SD			**0.06 ± 0.05**		**0.04 ± 0.05**
Cyclophosphamide (60 mg/kg/day)	81928	25	1.25	0	0.00
	81953	15	0.75	3	0.15
	81970	18	0.90	5	0.25
	81935	21	1.05	5	0.25
	81949	18	0.90	3	0.15
Mean ± SD			**0.97 ± 0.19***		**0.16 ± 0.10***

MN = Micronucleated NCE = Normochromatic Erythrocyte
TE = Total erythrocytes (PCE + NCE) PCE = Polychromatic Erythrocyte
Vehicle = Corn Oil
*Statistically different than vehicle control $p \leq 0.05$
[a] PCE:TE ratio < 20% of mean vehicle control ratio; animal not included in mean or statistics.

Mean = $\frac{\sum x_n}{n}$ Where x = the individual values; n = the number of values

SD = Standard Deviation = $\sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$

Male and Female: Ratio of Polychromatic Erythrocytes to Total Erythrocytes in Bone Marrow

	MALES				FEMALES			
TREATMENT	**Animal No.**	**PCEs**	**NCEs**	**PCE:TE Ratio**	**Animal No.**	**PCEs**	**NCEs**	**PCE:TE Ratio**
Vehicle	81996	567	433	0.57	81939	676	324	0.68
	81997	596	404	0.60	81942	854	146	0.85
	81998	420	580	0.42	81958	703	297	0.70
	82020	525	475	0.53	81975	550	450	0.55
	82025	570	430	0.57	81979	666	334	0.67
Mean ± SD				**0.54 ± 0.07**				**0.69 ± 0.11**
Sham	81983	382	618	0.38	81924	500	500	0.50
	81990	523	477	0.52	81952	796	204	0.80
	82004	472	528	0.47	81963	622	378	0.62
	82012	680	320	0.68	81940	521	479	0.52
	82017	550	450	0.55	81944	332	668	0.33
Mean ± SD				**0.52 ± 0.11**				**0.55 ± 0.17**
Naphthenic Acid (100 mg/kg/day)	81994	533	467	0.53	81930	750	250	0.75
	82001	443	557	0.44	81941	540	460	0.54
	82003	511	489	0.51	81960	724	276	0.72
	82011	490	510	0.49	81978	820	180	0.82
	82022	688	312	0.69	81916	422	578	0.42
Mean ± SD				**0.53 ± 0.09**				**0.65 ± 0.16**
Naphthenic Acid (300 mg/kg/day)	81993	442	558	0.44	81959	532	468	0.53
	81995	498	502	0.50	81974	847	153	0.85
	82013	563	437	0.56	81931	720	280	0.72
	82023	439	561	0.44	81934	693	307	0.69
	82031	520	480	0.52	81943	552	448	0.55
Mean ± SD				**0.49 ± 0.05**				**0.67 ± 0.13**
Naphthenic Acid (900 mg/kg/day)	82006	550	450	0.55	81951	867	133	0.87
	82010	549	451	0.55	81964 [a]	110	890	0.11
	82018	705	295	0.71	81955	648	352	0.65
	82029	488	512	0.49	81969	762	238	0.76
	82030	742	258	0.74	81973	714	286	0.71
Mean ± SD				**0.61 ± 0.11**				**0.75 ± 0.09**
Cyclophosphamide (60 mg/kg/day)	81985	274	726	0.27	81928	503	497	0.50
	81992	438	562	0.44	81953	697	303	0.70
	82008	197	803	0.20	81970	530	470	0.53
	82026	353	647	0.35	81935	355	645	0.36
	82033	750	250	0.75	81949	487	513	0.49
Mean ± SD				**0.40 ± 0.21**				**0.51 ± 0.12***

TE = Total erythrocytes (PCE + NCE) NCE = Normochromatic Erythrocyte
PCE = Polychromatic Erythrocyte Vehicle = Corn Oil
* Statistically different than vehicle control $p \leq 0.05$
[a] PCE:TE ratio < 20% of mean vehicle control ratio; animal not included in mean or statistics.

Mean = $\frac{\sum x_n}{n}$ Where x = the individual values; n = the number of values

SD = Standard Deviation = $\sqrt{\frac{\sum (x-\bar{x})^2}{n-1}}$

QUALITY ASSURANCE STATEMENT

Date(s) of Inspection	Critical Phase Inspected (Study-Based)	Date Observations Reported to:		
		Principal Investigator	Management	Study Director
20-Dec-2010	Slide staining	22-Dec-2010	28-Dec-2010	28-Dec-2010
26-Feb-2011	Report and raw data	26-Feb-2011	28-Jun-2012	29-Jun-2012

The portions of this study conducted at Midwest BioResearch, LLC were inspected in accordance with the standard operating procedures of Midwest BioResearch, LLC, and the sponsor's protocol and any protocol amendment(s). Quality Assurance observations, derived from the inspections during the portions of this study conducted at Midwest BioResearch, LLC and from the inspections of the raw data and report generated by Midwest BioResearch, LLC are documented and have been reported to the Midwest BioResearch, LLC Principal Investigator. A quarterly internal facility inspection is conducted by the Midwest BioResearch, LLC Quality Assurance Unit. Reports of all Quality Assurance inspections are submitted to Midwest BioResearch, LLC management.

This report accurately reflects the data generated during the portions of this study conducted at Midwest BioResearch, LLC. The methods and procedures used in the study were those specified in the protocol, any protocol amendment(s), and the standard operating procedures of Midwest BioResearch, LLC.

[redacted] Date: 10 July 2012

Quality Assurance Associate
Midwest BioResearch, LLC

FINAL REPORT

Contents:	Volume 3 of 6 (Appendices L-P [Tables A1-A5])
Study Title:	A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats
Laboratory Project ID:	WIL-402011
Author:	[redacted]
Test Guideline:	U.S. EPA OPPTS 870.3650 and 870.5395, ICH Guideline S2A and S2B, and OECD Guidelines 422 and 474
Study Completion Date:	30 August 2012
Performing Laboratory:	WIL Research Laboratories, LLC 1407 George Road Ashland, OH 44805-8946
Sponsor:	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
Total Number of Pages:	1897

APPENDIX L

Statistical Analysis Summary (BioSTAT Consultants, Inc.)

Statistical Analysis Summary
WIL Research Laboratories, LLC
Study Protocol – 402011
Version 1.0

1 Statistical Methodology
1.1 Analysis Endpoints
1.2 Motor Activity Analysis Methodology
2 Results
3 Statistical Analysis Summaries
Table 3.1: Analysis Summary Table for Motor Activity

Report Approval:

[redacted]

July 17, 2012
Date

BioSTAT Consultants, Inc.
528 W. Centre Ave.
Portage, MI 49024
(269) 329-7976

BioSTAT Consultants, Inc.
Statement of Quality Control

This report was quality checked in accordance with BioSTAT Procedural Guideline 2: *Quality Control Process for Tables and Reports*. The statistical methodology and results of inferential statistics were verified by an independent quality control statistician. Based on these documented quality control activities, it is concluded that the statistical results incorporated in this report accurately reflect the statistical analysis of data received by BioSTAT.

1 Statistical Methodology

1.1 Analysis Endpoints

- Motor Activity
  - Total Count
  - Ambulatory Count

1.2 Motor Activity Analysis Methodology

Total and ambulatory counts were analyzed, by sex and session, with a repeated measure analysis of variance (RMANOVA). Factors in the model included treatment group (TRT), time interval (TIME), and the interaction of time interval and treatment group (TRT*TIME). The SAS® procedure PROC MIXED was used for analysis with the random effect of animal included as the repeated measurement. The covariance structure across time was selected by comparing Akaike's Information Criterion (AIC).

The monotonic dose response relationship was evaluated using sequential linear trend tests based on ordinal spacing of dose levels. The linear dose by time interaction (LinTrt*Time) was evaluated and, if significant at the 0.05 level, trend tests on treatment means were performed at the 0.05 level for each time interval. If the linear dose by time interaction was not significant, the trend test was conducted across the pooled time intervals of the entire session only.

Nonmonotonic dose responses were evaluated whenever no significant linear trends were detected but TRT and/or TRT*TIME interaction was significant at the 0.01 level. Within the framework of the RMANOVA, pairwise comparisons were made for each individual treated group with the control group through linear contrasts. If TRT* TIME was significant, the comparisons were conducted for each time interval. If only the TRT effect was significant, the comparisons were conducted across the pooled time intervals of the entire session. These nonmonotonic dose response comparisons were conducted at the 0.01 significance level.

All statistical analyses were conducted using SAS® software.

2 Results

Results of statistical analyses are summarized in Section 3. There were no statistically significant findings.

Tables Legend

Motor Activity: For each analysis endpoint (study period/sex/endpoint), data are summarized by treatment group for each post-dose time interval and cumulative across post-dose time intervals. P-values for interaction terms are shown at the bottom of the table. If LinTrt*Time was not significant, sequential trend testing (described below) was conducted across the pooled time intervals only and the p-values are reported in the "Overall" row. "NT" (not tested) is reported for the p-value in the individual time interval rows. If LinTrt*Time was significant, sequential trend testing was conducted for each individual time interval as well as across the pooled time intervals. P-values are reported in the individual time interval and "Overall" rows.

Sequential trend tests: All dose groups are included in an initial trend test. If the trend test is not significant it is concluded that there is no significant dose-related trend and no further testing is conducted. If the trend test is significant, the highest dose group is flagged as significant and a trend test is conducted excluding the highest dose group. The sequence of trend tests continues until a test is not significant or the lowest nonzero dose is flagged as significant.

Table Key
Mean = arithmetic mean
S.D. = standard deviation of the sample
S.E. = standard error (standard deviation of the mean)
N = number of animals
% Difference Control = group mean percent difference from control
Linear Trend p-value = p-value for the treatment linear trend test
Trt F-test p-value = p-value for treatment group effect
Trt*Time p-value = p-value for the treatment by time interaction
LinTrt*Time p-value = p-value for the linear trend by time interaction
Covariance Structure: AR1=Autoregressive order 1, CS=Compound symmetric, ARH(1)=Autoregressive heterogenous order 1, CSH=Compound symmetric heterogenous

References
SAS® Proprietary Software; Version 9.1, SAS Institute Inc.: Cary, NC, 2002-2003.

3 Statistical Analysis Summaries

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	TOTAL	0-10	Mean	1355	1318	1367	1370	
				% Difference Control	NA	-2.7	0.9	1.1	
				S.D.	312.6	192.0	200.7	254.8	
				S.E.	90.2	55.4	57.9	73.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	747	787	676	751	
				% Difference Control	NA	5.4	-9.5	0.5	
				S.D.	201.3	211.6	290.5	229.9	
				S.E.	58.1	61.1	83.9	66.4	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	345	452	353	448	
				% Difference Control	NA	31.0	2.3	29.9	
				S.D.	229.7	250.4	291.3	275.4	
				S.E.	66.3	72.3	84.1	79.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	258	251	122	225	
				S.D.	340.7	261.6	237.4	311.6	
				S.E.	98.4	75.5	68.5	90.0	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	TOTAL	41-50	Mean	141	189	37	104	
				S.D.	248.6	223.6	42.6	171.9	
				S.E.	71.8	64.5	12.3	49.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	33	122	71	69	
				S.D.	36.1	199.7	112.0	97.9	
				S.E.	10.4	57.7	32.3	28.3	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	2878	3119	2626	2968	
				% Difference Control	NA	8.4	-8.8	3.1	
				S.D.	902.6	815.3	795.2	894.8	
				S.E.	260.6	235.4	229.6	258.3	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.842	
				Trt F-test p-value++					0.564
				Trt*Time p-value++					0.794
				LinTrt*Time p-value#					0.542
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	AMBULATORY	0-10	Mean	309	339	341	318	
				% Difference Control	NA	9.7	10.4	2.9	
				S.D.	83.6	82.4	90.9	77.1	
				S.E.	24.1	23.8	26.2	22.3	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	116	139	121	113	
				% Difference Control	NA	19.8	4.3	-2.6	
				S.D.	61.8	53.7	72.2	71.3	
				S.E.	17.8	15.5	20.8	20.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	40	62	57	74	
				% Difference Control	NA	55.0	42.5	85.0	
				S.D.	59.2	51.0	63.1	67.5	
				S.E.	17.1	14.7	18.2	19.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	51	39	17	32	
				S.D.	89.4	57.3	46.8	65.8	
				S.E.	25.8	16.5	13.5	19.0	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	M	AMBULATORY	41-50	Mean	17	23	2	8	
				S.D.	39.1	34.3	3.1	19.3	
				S.E.	11.3	9.9	0.9	5.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	0	16	11	10	
				S.D.	0.6	32.7	26.1	25.8	
				S.E.	0.2	9.4	7.5	7.4	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	532	617	548	556	
				% Difference Control	NA	16.0	3.0	4.5	
				S.D.	221.2	172.3	192.0	185.8	
				S.E.	63.8	49.7	55.4	53.6	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.995	
				Trt F-test p-value++					0.726
				Trt*Time p-value++					0.742
				LinTrt*Time p-value#					0.167
				Covariance Structure					ARH1

: Level of Significance tested = .05.
* : Statistically Significant.
++ : Level of Significance tested = .01.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	TOTAL	0-10	Mean	1401	1475	1354	1532	
				% Difference Control	NA	5.3	-3.4	9.4	
				S.D.	197.5	227.4	146.3	327.0	
				S.E.	65.8	65.7	46.3	103.4	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	583	768	768	809	
				% Difference Control	NA	31.7	31.7	38.8	
				S.D.	316.8	267.1	210.2	366.2	
				S.E.	105.6	77.1	66.5	115.8	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	212	414	428	372	
				% Difference Control	NA	95.3	101.9	75.5	
				S.D.	192.7	305.1	239.7	342.7	
				S.E.	64.2	88.1	75.8	108.4	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	363	281	375	421	
				S.D.	286.4	280.9	338.1	394.6	
				S.E.	95.5	81.1	106.9	124.8	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05.
* : Statistically Significant.
++ : Level of Significance tested = .01.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	TOTAL	41-50	Mean	248	113	228	362	
				S.D.	306.2	204.5	247.8	419.0	
				S.E.	102.1	59.0	78.4	132.5	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	91	145	192	155	
				S.D.	122.5	233.2	274.3	210.7	
				S.E.	40.8	67.3	86.7	66.6	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	2898	3196	3346	3650	
				% Difference Control	NA	10.3	15.5	25.9	
				S.D.	745.4	975.8	807.7	1101.6	
				S.E.	248.5	281.7	255.4	348.4	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.106	
				Trt F-test p-value++					0.447
				Trt*Time p-value++					0.620
				LinTrt*Time p-value#					0.903
				Covariance Structure					ARH1

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	AMBULATORY	0-10	Mean	412	410	390	413	
				% Difference Control	NA	-0.5	-5.3	0.2	
				S.D.	121.4	90.3	88.8	120.0	
				S.E.	40.5	26.1	28.1	37.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	102	163	166	168	
				% Difference Control	NA	59.8	62.7	64.7	
				S.D.	75.2	88.5	72.9	132.7	
				S.E.	25.1	25.6	23.1	42.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	30	81	96	70	
				% Difference Control	NA	170.0	220.0	133.3	
				S.D.	44.9	95.0	69.2	88.2	
				S.E.	15.0	27.4	21.9	27.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	71	68	85	80	
				S.D.	76.2	104.9	98.6	89.2	
				S.E.	25.4	30.3	31.2	28.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05.
* : Statistically Significant.
++ : Level of Significance tested = .01.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
PRETEST	F	AMBULATORY	41-50	Mean	66	20	43	71	
				S.D.	107.8	59.4	56.1	111.3	
				S.E.	35.9	17.1	17.7	35.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	5	30	42	27	
				S.D.	8.1	56.4	80.9	47.1	
				S.E.	2.7	16.3	25.6	14.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	686	773	822	829	
				% Difference Control	NA	12.7	19.8	20.8	
				S.D.	200.2	347.3	282.9	316.6	
				S.E.	66.7	100.3	89.5	100.1	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.281	
				Trt F-test p-value++					0.731
				Trt*Time p-value++					0.827
				LinTrt*Time p-value#					0.765
				Covariance Structure					ARH1

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	TOTAL	0-10	Mean	1294	1184	1162	1226	
				% Difference Control	NA	-8.5	-10.2	-5.3	
				S.D.	224.9	206.8	196.2	121.9	
				S.E.	64.9	59.7	56.6	35.2	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	677	637	492	676	
				% Difference Control	NA	-5.9	-27.3	-0.1	
				S.D.	241.2	161.0	170.0	141.8	
				S.E.	69.6	46.5	49.1	40.9	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	478	347	334	418	
				% Difference Control	NA	-27.4	-30.1	-12.6	
				S.D.	349.5	222.7	242.5	274.1	
				S.E.	100.9	64.3	70.0	79.1	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	401	226	158	343	
				S.D.	292.1	217.3	169.6	301.8	
				S.E.	84.3	62.7	49.0	87.1	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	TOTAL	41-50	Mean	189	213	207	234	
				S.D.	265.0	176.3	205.1	230.3	
				S.E.	76.5	50.9	59.2	66.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	197	232	104	236	
				S.D.	207.4	235.6	145.8	289.1	
				S.E.	59.9	68.0	42.1	83.5	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	3234	2839	2458	3133	
				% Difference Control	NA	-12.2	-24.0	-3.1	
				S.D.	1012.6	855.4	539.0	975.9	
				S.E.	292.3	246.9	155.6	281.7	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.543	
				Trt F-test p-value++					0.126
				Trt*Time p-value++					0.443
				LinTrt*Time p-value#					0.885
				Covariance Structure					ARH1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	AMBULATORY	0-10	Mean	251	250	240	256	
				% Difference Control	NA	-0.4	-4.4	2.0	
				S.D.	77.8	74.4	64.8	50.5	
				S.E.	22.5	21.5	18.7	14.6	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	120	99	64	101	
				% Difference Control	NA	-17.5	-46.7	-15.8	
				S.D.	73.2	53.2	42.1	28.3	
				S.E.	21.1	15.4	12.1	8.2	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	83	48	59	72	
				% Difference Control	NA	-42.2	-28.9	-13.3	
				S.D.	82.4	49.6	55.4	58.5	
				S.E.	23.8	14.3	16.0	16.9	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	79	30	23	64	
				S.D.	78.3	46.2	27.5	66.3	
				S.E.	22.6	13.3	8.0	19.2	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
WEEK_004	M	AMBULATORY	41-50	Mean	38	30	26	29	
				S.D.	83.3	37.1	29.6	31.4	
				S.E.	24.0	10.7	8.5	9.1	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	29	36	8	36	
				S.D.	41.6	53.2	18.3	48.2	
				S.E.	12.0	15.3	5.3	13.9	
				N	12	12	12	12	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	600	494	421	559	
				% Difference Control	NA	-17.7	-29.8	-6.8	
				S.D.	322.3	232.7	143.1	177.7	
				S.E.	93.0	67.2	41.3	51.3	
				N	12	12	12	12	
			Overall	Linear Trend p-value#		NT	NT	0.507	
				Trt F-test p-value++					0.233
				Trt*Time p-value++					0.319
				LinTrt*Time p-value#					0.681
				Covariance Structure					ARH1

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	TOTAL	0-10	Mean	1115	1181	1145	1134	
				% Difference Control	NA	5.9	2.7	1.7	
				S.D.	193.7	227.3	134.5	117.9	
				S.E.	64.6	65.6	42.5	37.3	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	486	423	447	444	
				% Difference Control	NA	-13.0	-8.0	-8.6	
				S.D.	369.8	377.9	250.3	301.2	
				S.E.	123.3	109.1	79.2	95.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	295	293	272	284	
				% Difference Control	NA	-0.7	-7.8	-3.7	
				S.D.	353.4	294.4	283.0	398.5	
				S.E.	117.8	85.0	89.5	126.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	199	253	236	286	
				S.D.	320.5	265.2	247.6	421.0	
				S.E.	106.8	76.6	78.3	133.1	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	TOTAL	41-50	Mean	163	228	243	270	
				S.D.	127.2	262.1	314.5	325.6	
				S.E.	42.4	75.7	99.5	103.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	360	260	177	228	
				S.D.	353.2	295.8	267.4	358.8	
				S.E.	117.7	85.4	84.5	113.5	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	2617	2637	2520	2646	
				% Difference Control	NA	0.8	-3.7	1.1	
				S.D.	1021.6	1236.7	1225.7	1503.1	
				S.E.	340.5	357.0	387.6	475.3	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.986	
				Trt F-test p-value++					0.995
				Trt*Time p-value++					0.964
				LinTrt*Time p-value#					0.493
				Covariance Structure					AR1

: Level of Significance tested = .05. ++ : Level of Significance tested = .01.
* : Statistically Significant. NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	AMBULATORY	0-10	Mean	261	275	278	242	
				% Difference Control	NA	5.4	6.5	-7.3	
				S.D.	64.7	78.5	47.2	38.5	
				S.E.	21.6	22.7	14.9	12.2	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			11-20	Mean	97	68	57	59	
				% Difference Control	NA	-29.9	-41.2	-39.2	
				S.D.	69.6	89.9	48.4	64.7	
				S.E.	23.2	25.9	15.3	20.5	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			21-30	Mean	51	47	33	49	
				% Difference Control	NA	-7.8	-35.3	-3.9	
				S.D.	73.5	68.9	50.1	75.8	
				S.E.	24.5	19.9	15.9	24.0	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			31-40	Mean	32	45	31	54	
				S.D.	65.1	62.0	38.0	88.3	
				S.E.	21.7	17.9	12.0	27.9	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

Table 3.1: Analysis Summary Table for Motor Activity

Period	Sex	Variable	Minutes	Statistic	Dosage Level (mg/kg/day) 0	100	300	900	Statistical Model
LD_004	F	AMBULATORY	41-50	Mean	17	22	42	43	
				S.D.	28.4	33.1	89.8	70.6	
				S.E.	9.5	9.6	28.4	22.3	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			51-60	Mean	41	42	38	33	
				S.D.	43.2	55.3	68.0	84.7	
				S.E.	14.4	16.0	21.5	26.8	
				N	9	12	10	10	
				Linear Trend p-value#		NT	NT	NT	
			Cumulative	Mean	498	498	477	479	
				% Difference Control	NA	0.0	-4.2	-3.8	
				S.D.	196.6	252.1	269.3	330.6	
				S.E.	65.5	72.8	85.1	104.6	
				N	9	12	10	10	
			Overall	Linear Trend p-value#		NT	NT	0.839	
				Trt F-test p-value++					0.996
				Trt*Time p-value++					0.822
				LinTrt*Time p-value#					0.480
				Covariance Structure					AR1

: Level of Significance tested = .05.
++ : Level of Significance tested = .01.
* : Statistically Significant.
NT : Not tested. NA : Not applicable.

APPENDIX M

WIL Subchronic FOB Historical Control Data Version 1.2
[Crl:CD(SD) Rats]

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Study Table

HC NUMBER	ROUTE	VEHICLE	START DATE	END DATE	AGE AT START (WEEKS)
54	ORAL	DIET	11/16/2000	2/16/2001	7
55	ORAL	SESAME OIL	10/25/2000	1/25/2001	7
56	ORAL	PEG 400	7/30/1999	9/10/1999	6
57	ORAL	DISTILLED WATER	6/18/1999	7/30/1999	6
58	ORAL	DISTILLED WATER	11/9/1999	12/21/1999	8
59	ORAL	0.5% MC / 0.2% TWEEN 80	8/28/2000	9/26/2000	7
60	ORAL	DEIONIZED WATER	1/25/2001	2/22/2001	7
61	ORAL	DEIONIZED WATER	11/5/2001	12/3/2001	7
62	ORAL	OLIVE OIL	11/21/2001	12/19/2001	7
63	ORAL	CORN OIL	4/26/2000	8/23/2000	7
64	ORAL	CORN OIL	6/14/1999	7/26/1999	6
65	ORAL	CORN OIL	6/21/1999	8/2/1999	6
66	ORAL	DIET	6/21/1999	10/18/1999	7
67	ORAL	DIET	1/22/2001	4/26/2001	6
68	ORAL	DEIONIZED WATER	2/27/2001	5/31/2001	6

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Study Table

HC NUMBER	ROUTE	VEHICLE	START DATE	END DATE	AGE AT START (WEEKS)
69	ORAL	DEIONIZED WATER	5/10/2005	8/10/2005	7
70	ORAL	CORN OIL	2/13/2006	3/27/2005	8
71	ORAL	CORN OIL	3/22/2006	5/3/2006	8
72	ORAL	CORN OIL	1/6/2005	2/7/2005	7
73	ORAL	OLIVE OIL	1/3/2006	2/14/2006	7
74	ORAL	DEIONIZED WATER	12/12/2005	6/13/2006	6
75	ORAL	DEIONIZED WATER	5/6/2005	6/3/2005	7
76	INHALATION	FILTERED AIR	6/25/2005	10/28/2005	6
77	ORAL	CORN OIL	10/26/2005	12/7/2005	7
78	ORAL	CORN OIL	12/21/2005	2/1/2006	7
79	INHALATION	FILTERED AIR	8/2/2005	11/4/2005	8
80	ORAL	DIET	12/1/2004	3/2/2005	7
81	ORAL	CORN OIL	3/22/2005	5/4/2005	7
82	ORAL	DIET	4/18/2005	7/21/2005	6
83	GAVAGE	DI WATER	7/17/2008	11/14/2008	8

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Study Table

HC NUMBER	ROUTE	VEHICLE	START DATE	END DATE	AGE AT START (WEEKS)
84	INTRAMUSCULAR INJECTION	PERAMIVIR PLACEBO	6/26/2007	1/5/2008	7
85	GAVAGE	CORN OIL	1/28/2008	3/10/2008	7
86	GAVAGE	CORN OIL	7/4/2008	8/15/2008	8
87	GAVAGE	METHYLCELLULOSE, TWEEN 80 AND DI WATER	1/14/2008	4/18/2008	6
88	DERMAL	DEIONIZED WATER	1/7/2008	4/8/2008	9
89	INHALATION	FILTERED AIR	4/3/2008	5/26/2008	11
90	DIET	BASAL DIET	12/11/2008	1/9/2009	7
91	DIET	BASAL DIET	3/19/2008	6/19/2008	8
92	GAVAGE	DI WATER	12/7/2008	12/19/2008	8
93	GAVAGE	CORN OIL	3/19/2008	4/30/2008	7
95	NOSE-ONLY INHALATION	FILTERED AIR	6/28/2008	7/25/2008	9
96	DIET	BASAL DIET	7/1/2008	10/3/2008	6
98	DIET	DRINKING WATER	4/28/2008	7/28/2008	7
99	DIET	BASAL DIET	8/5/2008	9/3/2008	8

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
HOME CAGE OBSERVATIONS				
POSTURE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	224	24	10	177
1 - SITTING OR STANDING NORMALLY	121	6	5	99
2 - ASLEEP, LYING ON SIDE OR CURLED UP	90	17	4	46
3 - ALERT, ORIENTED TOWARD OBSERVER	11	0	1	30
4 - SITTING, HEAD HELD LOW	2	1	0	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	0	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0	0
7 - IMMOBILE	0	0	0	0
8 - REARING	0	0	0	2
9 - SPLAYED HINDLIMBS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - ABSENT	222	24	10	175
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0
CONVULSIONS - TONIC				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - ABSENT	222	24	10	175
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
HOME CAGE OBSERVATIONS				
TREMORS				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NONE	222	24	10	175
2 - SLIGHT (1.5 MM)	0	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
BITING				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NONE	222	24	10	174
2 - BITING OF CAGE	0	0	0	0
3 - BITING OF SELF	0	0	0	1
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	225	24	10	175
1 - EYELIDS WIDE OPEN	139	9	8	132
2 - EYELIDS SLIGHTLY DROOPING	8	0	1	3
3 - DROOPING EYELIDS (HALF CLOSED)	14	2	1	9
4 - EYELIDS COMPLETELY SHUT	64	13	0	31
FECES CONSISTENCY				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	229	24	10	175
1 - PELLETS	190	18	8	116
2 - PELLETS, PARTIALLY FORMED	0	0	0	0
3 - UNFORMED, DIARRHEA	0	0	0	0
4 - PELLETS ABSENT	39	6	2	59

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
EASE OF REMOVAL FROM CAGE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - VERY EASY	174	11	4	139
2 - EASY	30	1	6	23
3 - MODERATELY DIFFICULT	1	0	0	1
4 - FREEZES	0	0	0	0
5 - DIFFICULT	5	0	0	0
6 - VERY DIFFICULT	0	0	0	0
EASE OF HANDLING ANIMAL IN HAND				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - LOW	210	12	10	148
2 - MODERATELY LOW	0	0	0	15
3 - MODERATELY HIGH	0	0	0	0
4 - HIGH	0	0	0	0
LACRIMATION				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - NONE	210	12	10	163
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
CHROMODACRYORRHEA				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - ABSENT	210	12	10	163
2 - PRESENT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
SALIVATION				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - NONE	210	12	10	163
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
PILOERECTION				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - NONE	210	12	9	162
2 - SLIGHT	0	0	1	1
3 - SEVERE	0	0	0	0
FUR APPEARANCE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - NORMAL: CLEAN AND GROOMED	210	12	9	163
2 - SLIGHTLY SOILED	0	0	1	0
3 - VERY SOILED, CRUSTY	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - EYELIDS WIDE OPEN	210	12	10	163
2 - EYELIDS SLIGHTLY DROOPING	0	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
RESPIRATORY RATE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	210	12	10	163
2 - DECREASED: (BELOW 80/MIN.)	0	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0	0
RESPIRATORY CHARACTER				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - NORMAL	210	12	10	163
2 - RALES	0	0	0	0
3 - RETCHING	0	0	0	0
4 - DYSPNEIC	0	0	0	0
5 - GASPING	0	0	0	0
RED DEPOSITS - EYES				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PRESENT	1	0	0	6
2 - ABSENT	209	12	10	157
RED DEPOSITS - NOSE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PRESENT	10	0	1	6
2 - ABSENT	200	12	9	157
RED DEPOSITS - MOUTH				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PRESENT	0	0	0	0
2 - ABSENT	210	12	10	163

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
CRUSTY DEPOSITS - EYES				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PRESENT	0	0	0	2
2 - ABSENT	210	12	10	161
CRUSTY DEPOSITS - NOSE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PRESENT	1	0	0	5
2 - ABSENT	209	12	10	158
CRUSTY DEPOSITS - MOUTH				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PRESENT	0	0	0	0
2 - ABSENT	210	12	10	163
MUCOUS MEMBRANES - COLOR				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PINK	210	12	10	163
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
EYES - COLOR				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PINK	210	12	10	163
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
SKIN - COLOR				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - PINK	210	12	10	163
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
EYE PROMINENCE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - NORMAL	210	12	10	163
2 - EXOPHTHALMUS	0	0	0	0
3 - ENOPHTHALMUS	0	0	0	0
MUSCLE TONE				
NUMBER OF STUDIES	27	1	2	21
NUMBER OF ANIMALS TESTED	210	12	10	163
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	210	12	10	163
2 - MUSCLE IS SOFT AND FLABBY	0	0	0	0
3 - MUSCLE IS TENSE AND HARD	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
MOBILITY				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
1 - NORMAL	222	24	10	187
2 - SLIGHTLY IMPAIRED	0	0	0	0
3 - MODERATELY IMPAIRED	0	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0	0
GAIT				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
1 - NORMAL	222	24	10	185
2 - WALKS ON TIPTOES	0	0	0	0
3 - BODY DRAGS	0	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0	1
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	0	0	0	1
6 - ATAXIA	0	0	0	0
7 - WALKS ON METATARSUS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
1 - ABSENT	222	24	10	187
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
CONVULSIONS - TONIC				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
1 - ABSENT	222	24	10	187
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0
TREMORS				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
1 - NONE	222	24	10	186
2 - SLIGHT (1.5 MM)	0	0	0	1
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
GAIT SCORE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
1 - NORMAL	221	24	10	186
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	0	0	0	1
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	1	0	0	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
AROUSAL				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
1 - VERY LOW	1	0	0	0
2 - LOW	2	0	5	10
3 - NORMAL	219	24	5	175
4 - SOMEWHAT HIGH	0	0	0	2
5 - VERY HIGH	0	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	23	10	187
1 - NONE	222	23	10	187
2 - HEAD FLICK	0	0	0	0
3 - HEAD SEARCH	0	0	0	0
4 - HALLUCINATORY	0	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0	0
6 - PRANCING	0	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0	0
8 - AIMLESS WANDERING	0	0	0	0
9 - CIRCLING	0	0	0	0
10 - WALTZING	0	0	0	0
11 - RETROPULSION	0	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0	0
15 - VERTICAL JUMPING	0	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0	0
17 - HEAD BOBBING	0	0	0	0
18 - WRITHING	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
TIME TO FIRST STEP (seconds)				
GRAND MEAN	0.4	0.3	0.7	0.6
SD	0.11	0.04	0.21	0.43
MIN	0.2	0.3	0.6	0.3
MAX	0.6	0.3	0.9	2.4
REARING				
GRAND MEAN	5.7	2.9	2.8	5.2
SD	1.54	2.71	3.68	2.33
MIN	3.0	1.0	0.2	0.4
MAX	8.8	4.8	5.4	8.4
BACKING				
GRAND MEAN	0.0	0.0	0.0	0.0
SD	0.04	0.00	0.00	0.05
MIN	0.0	0.0	0.0	0.0
MAX	0.2	0	0.0	0.2
GROOMING				
GRAND MEAN	0.5	0.1	0.0	0.2
SD	0.28	0.06	0.00	0.19
MIN	0.0	0.1	0.0	0.0
MAX	1.1	0.2	0.0	0.6
URINATION				
GRAND MEAN	0.6	0.5	1.5	1.1
SD	0.43	0.29	1.84	0.78
MIN	0.0	0.3	0.2	0.2
MAX	1.8	0.8	2.8	3.4

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
DEFECATION				
GRAND MEAN	0.9	1.5	1.2	1.0
SD	0.48	0.71	0.85	0.54
MIN	0.2	1.0	0.6	0.2
MAX	1.8	2	1.8	2.2

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
SENSORY OBSERVATIONS				
APPROACH RESPONSE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO REACTION	19	3	8	14
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	202	21	2	159
3 - MORE ENERGETIC RESPONSE THAN (2)	1	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	1
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	1
TOUCH RESPONSE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO REACTION	16	3	2	18
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	206	21	8	156
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	1
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
STARTLE RESPONSE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO REACTION	0	0	0	2
2 - SLIGHT REACTION	220	24	9	168
3 - MORE ENERGETIC RESPONSE THAN (2)	2	0	1	5
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
SENSORY OBSERVATIONS				
TAIL PINCH				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO REACTION	6	2	1	4
2 - ANIMAL MAY TURN OR WALK AWAY	188	22	7	154
3 - MORE ENERGETIC RESPONSE THAN (2)	28	0	2	17
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0	0
OLFACTORY ORIENTATION				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO REACTION PRESENT	0	0	1	7
2 - REACTION PRESENT	222	24	9	168
PUPIL RESPONSE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO PUPIL RESPONSE	0	1	0	3
2 - PUPIL RESPONSE PRESENT	222	23	10	172
EYEBLINK RESPONSE				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO EYEBLINK RESPONSE	0	0	0	0
2 - EYEBLINK RESPONSE PRESENT	222	24	10	175
FORELIMB EXTENSION				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO FORELIMB EXTENSION	1	0	0	0
2 - FORELIMB EXTENSION PRESENT	221	24	10	175

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
SENSORY OBSERVATIONS				
HINDLIMB EXTENSION				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NO HINDLIMB EXTENSION	1	0	0	0
2 - HINDLIMB EXTENSION PRESENT	221	24	10	175
AIR RIGHTING REFLEX				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - NORMAL	222	24	10	173
2 - SLIGHTLY UNCOORDINATED	0	0	0	2
3 - LANDS ON SIDE	0	0	0	0
4 - LANDS ON BACK	0	0	0	0
NEUROMUSCULAR OBSERVATIONS				
HINDLIMB EXTENSOR STRENGTH				
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	175
1 - HINDLIMB RESISTANCE ABSENT	0	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	1	0
3 - HINDLIMB RESISTANCE PRESENT	222	24	9	175

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
NEUROMUSCULAR OBSERVATIONS				
GRIPSTRENGTH - HINDLIMB (g)				
GRAND MEAN	278.5	311.1	565.9	417.5
SD	58.06	4.77	95.18	97.90
MIN	164.0	307.8	498.6	192.7
MAX	461.8	314.5	633.2	640.0
GRIPSTRENGTH - FORELIMB (g)				
GRAND MEAN	539.3	661.5	807.5	748.0
SD	103.33	144.31	58.12	172.93
MIN	389.0	559.4	766.4	374.2
MAX	771.6	763.5	848.6	1056.6
ROTAROD PERFORMANCE (seconds)				
GRAND MEAN	84.8	87.3	87.3	80.6
SD	18.48	13.55	10.20	16.96
MIN	51.0	77.8	80.1	53.2
MAX	120.0	96.9	94.5	111.3
HINDLIMB FOOTSPLAY (mm)				
GRAND MEAN	71.2	68.2	87.2	74.6
SD	9.97	2.24	3.11	9.05
MIN	52.1	66.7	85.0	56.9
MAX	92.8	69.8	89.4	89.6

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	28	2	2	22
NUMBER OF ANIMALS TESTED	222	24	10	187
AGE RANGE OF ANIMALS TESTED	6 - 11	7 - 7	8 - 8	9 - 11
PHYSIOLOGICAL OBSERVATIONS				
CATALEPSY (seconds)				
GRAND MEAN	0.4	0.4	0.5	0.4
SD	0.17	0.08	0.10	0.21
MIN	0.2	0.3	0.4	0.2
MAX	0.8	0.4	0.6	1.2
BODY TEMPERATURE (ºC)				
GRAND MEAN	37.8	38.1	38.3	38.3
SD	0.71	1.37	0.03	0.74
MIN	36.4	37.1	38.3	36.6
MAX	39.2	39	38.3	40.0

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
HOME CAGE OBSERVATIONS				
POSTURE				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	217	25	10	184
1 - SITTING OR STANDING NORMALLY	124	15	5	108
2 - ASLEEP, LYING ON SIDE OR CURLED UP	67	4	1	19
3 - ALERT, ORIENTED TOWARD OBSERVER	17	2	4	43
4 - SITTING, HEAD HELD LOW	0	0	0	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	1	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0	0
7 - IMMOBILE	0	0	0	0
8 - REARING	8	4	0	14
9 - SPLAYED HINDLIMBS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - ABSENT	212	24	10	175
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0
CONVULSIONS - TONIC				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - ABSENT	212	24	10	175
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
HOME CAGE OBSERVATIONS				
TREMORS				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NONE	212	24	10	174
2 - SLIGHT (1.5 MM)	0	0	0	1
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
BITING				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NONE	211	24	10	173
2 - BITING OF CAGE	1	0	0	2
3 - BITING OF SELF	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - EYELIDS WIDE OPEN	146	20	9	156
2 - EYELIDS SLIGHTLY DROOPING	10	1	0	7
3 - DROOPING EYELIDS (HALF CLOSED)	6	0	0	4
4 - EYELIDS COMPLETELY SHUT	50	3	1	8
FECES CONSISTENCY				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - PELLETS	176	13	4	93
2 - PELLETS, PARTIALLY FORMED	0	0	0	1
3 - UNFORMED, DIARRHEA	0	0	0	0
4 - PELLETS ABSENT	36	11	6	81

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
EASE OF REMOVAL FROM CAGE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - VERY EASY	165	12	6	147
2 - EASY	30	0	4	16
3 - MODERATELY DIFFICULT	3	0	0	0
4 - FREEZES	0	0	0	0
5 - DIFFICULT	2	0	0	0
6 - VERY DIFFICULT	0	0	0	0
EASE OF HANDLING ANIMAL IN HAND				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - LOW	189	12	9	155
2 - MODERATELY LOW	11	0	1	8
3 - MODERATELY HIGH	0	0	0	0
4 - HIGH	0	0	0	0
LACRIMATION				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - NONE	200	12	10	162
2 - SLIGHT	0	0	0	1
3 - SEVERE	0	0	0	0
CHROMODACRYORRHEA				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - ABSENT	200	12	10	163
2 - PRESENT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
SALIVATION				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - NONE	200	12	10	163
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
PILOERECTION				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - NONE	200	12	10	163
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
FUR APPEARANCE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - NORMAL: CLEAN AND GROOMED	200	12	10	163
2 - SLIGHTLY SOILED	0	0	0	0
3 - VERY SOILED, CRUSTY	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - EYELIDS WIDE OPEN	200	12	10	163
2 - EYELIDS SLIGHTLY DROOPING	0	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
RESPIRATORY RATE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	200	12	10	163
2 - DECREASED: (BELOW 80/MIN.)	0	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0	0
RESPIRATORY CHARACTER				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	162
1 - NORMAL	200	12	10	162
2 - RALES	0	0	0	0
3 - RETCHING	0	0	0	0
4 - DYSPNEIC	0	0	0	0
5 - GASPING	0	0	0	0
RED DEPOSITS - EYES				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PRESENT	0	0	0	1
2 - ABSENT	200	12	10	162
RED DEPOSITS - NOSE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PRESENT	5	0	0	0
2 - ABSENT	195	12	10	163
RED DEPOSITS - MOUTH				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PRESENT	0	0	0	0
2 - ABSENT	200	12	10	163

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
CRUSTY DEPOSITS - EYES				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PRESENT	0	0	0	1
2 - ABSENT	200	12	10	162
CRUSTY DEPOSITS - NOSE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PRESENT	0	0	0	3
2 - ABSENT	200	12	10	160
CRUSTY DEPOSITS - MOUTH				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PRESENT	0	0	0	1
2 - ABSENT	200	12	10	162
MUCOUS MEMBRANES - COLOR				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PINK	200	12	10	163
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
HANDLING OBSERVATIONS				
EYES - COLOR				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PINK	200	12	10	163
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
SKIN - COLOR				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - PINK	200	12	10	163
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
EYE PROMINENCE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - NORMAL	200	12	10	161
2 - EXOPHTHALMUS	0	0	0	2
3 - ENOPHTHALMUS	0	0	0	0
MUSCLE TONE				
NUMBER OF STUDIES	26	1	2	21
NUMBER OF ANIMALS TESTED	200	12	10	163
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	199	12	10	163
2 - MUSCLE IS SOFT AND FLABBY	1	0	0	0
3 - MUSCLE IS TENSE AND HARD	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
MOBILITY				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - NORMAL	212	24	10	163
2 - SLIGHTLY IMPAIRED	0	0	0	0
3 - MODERATELY IMPAIRED	0	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0	0
GAIT				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - NORMAL	212	24	10	163
2 - WALKS ON TIPTOES	0	0	0	0
3 - BODY DRAGS	0	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0	0
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	0	0	0	0
6 - ATAXIA	0	0	0	0
7 - WALKS ON METATARSUS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - ABSENT	212	24	10	163
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
CONVULSIONS - TONIC				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - ABSENT	212	24	10	163
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0
TREMORS				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - NONE	212	24	10	162
2 - SLIGHT (1.5 MM)	0	0	0	1
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
GAIT SCORE				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - NORMAL	212	24	10	163
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	0	0	0	0
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	0	0	0	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
AROUSAL				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - VERY LOW	0	0	0	0
2 - LOW	0	0	1	1
3 - NORMAL	212	23	9	158
4 - SOMEWHAT HIGH	0	1	0	4
5 - VERY HIGH	0	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR				
NUMBER OF STUDIES	27	2	2	21
NUMBER OF ANIMALS TESTED	212	24	10	163
1 - NONE	212	24	10	162
2 - HEAD FLICK	0	0	0	0
3 - HEAD SEARCH	0	0	0	0
4 - HALLUCINATORY	0	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0	0
6 - PRANCING	0	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0	0
8 - AIMLESS WANDERING	0	0	0	0
9 - CIRCLING	0	0	0	1
10 - WALTZING	0	0	0	0
11 - RETROPULSION	0	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0	0
15 - VERTICAL JUMPING	0	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0	0
17 - HEAD BOBBING	0	0	0	0
18 - WRITHING	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
TIME TO FIRST STEP (seconds)				
GRAND MEAN	0.3	0.4	0.5	0.4
SD	0.09	0.03	0.14	0.12
MIN	0.2	0.4	0.4	0.3
MAX	0.6	0.4	0.6	0.7
REARING				
GRAND MEAN	7.3	7.2	10.9	9.2
SD	1.66	0.24	5.23	2.83
MIN	4.1	7.0	7.2	3.6
MAX	9.8	7.3	14.6	14.8
BACKING				
GRAND MEAN	0.0	0.0	0.0	0.0
SD	0.03	0.00	0.00	0.00
MIN	0.0	0.0	0.0	0.0
MAX	0.1	0	0.0	0.0
GROOMING				
GRAND MEAN	0.4	0.1	0.1	0.2
SD	0.36	0.00	0.14	0.26
MIN	0.0	0.1	0.0	0.0
MAX	1.4	0.1	0.2	0.9
URINATION				
GRAND MEAN	0.5	0.1	0.2	0.4
SD	0.63	0.06	0.00	0.52
MIN	0.0	0.1	0.2	0.0
MAX	3.2	0.2	0.2	2.2

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
OPEN FIELD OBSERVATIONS				
DEFECATION				
GRAND MEAN	0.2	0.0	0.0	0.1
SD	0.25	0.00	0.00	0.08
MIN	0.0	0.0	0.0	0.0
MAX	0.8	0	0.0	0.2

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
SENSORY OBSERVATIONS				
APPROACH RESPONSE				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO REACTION	13	2	2	12
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	197	22	8	158
3 - MORE ENERGETIC RESPONSE THAN (2)	2	0	0	5
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
TOUCH RESPONSE				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO REACTION	5	2	5	10
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	205	22	5	158
3 - MORE ENERGETIC RESPONSE THAN (2)	2	0	0	7
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
STARTLE RESPONSE				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO REACTION	0	0	1	1
2 - SLIGHT REACTION	206	24	8	159
3 - MORE ENERGETIC RESPONSE THAN (2)	6	0	1	15
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
SENSORY OBSERVATIONS				
TAIL PINCH				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO REACTION	2	0	1	7
2 - ANIMAL MAY TURN OR WALK AWAY	173	23	5	131
3 - MORE ENERGETIC RESPONSE THAN (2)	37	1	4	37
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0	0
OLFACTORY ORIENTATION				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO REACTION PRESENT	1	0	2	2
2 - REACTION PRESENT	211	24	8	173
PUPIL RESPONSE				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO PUPIL RESPONSE	0	0	0	4
2 - PUPIL RESPONSE PRESENT	212	24	10	171
EYEBLINK RESPONSE				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO EYEBLINK RESPONSE	0	0	0	0
2 - EYEBLINK RESPONSE PRESENT	212	24	10	175
FORELIMB EXTENSION				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO FORELIMB EXTENSION	1	0	0	0
2 - FORELIMB EXTENSION PRESENT	211	24	10	175

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
SENSORY OBSERVATIONS				
HINDLIMB EXTENSION				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NO HINDLIMB EXTENSION	0	0	0	0
2 - HINDLIMB EXTENSION PRESENT	212	24	10	175
AIR RIGHTING REFLEX				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - NORMAL	211	24	10	175
2 - SLIGHTLY UNCOORDINATED	1	0	0	0
3 - LANDS ON SIDE	0	0	0	0
4 - LANDS ON BACK	0	0	0	0
NEUROMUSCULAR OBSERVATIONS				
HINDLIMB EXTENSOR STRENGTH				
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
1 - HINDLIMB RESISTANCE ABSENT	0	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	0	0
3 - HINDLIMB RESISTANCE PRESENT	212	24	10	175

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
NEUROMUSCULAR OBSERVATIONS				
GRIPSTRENGTH - HINDLIMB (g)				
GRAND MEAN	265.8	258.4	480.1	377.8
SD	50.89	17.91	96.59	98.81
MIN	181.3	245.8	411.8	221.2
MAX	388.4	271.1	548.4	599.0
GRIPSTRENGTH - FORELIMB (g)				
GRAND MEAN	499.2	550.3	660.9	642.5
SD	106.85	193.57	62.37	158.73
MIN	341.6	413.4	616.8	242.9
MAX	734.7	687.2	705.0	898.2
ROTAROD PERFORMANCE (seconds)				
GRAND MEAN	69.9	69.8	75.4	80.9
SD	19.84	5.89	6.75	21.09
MIN	32.3	65.6	70.6	53.2
MAX	104.5	73.9	80.1	120.0
HINDLIMB FOOTSPLAY (mm)				
GRAND MEAN	61.7	59.1	55.1	60.1
SD	7.92	2.89	7.21	9.98
MIN	45.6	57.1	50.0	34.4
MAX	72.5	61.2	60.2	73.0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	PRETEST	1	2	3
NUMBER OF STUDIES	27	2	2	22
NUMBER OF ANIMALS TESTED	212	24	10	175
AGE RANGE OF ANIMALS TESTED	6 - 8	7 - 7	8 - 8	9 - 11
PHYSIOLOGICAL OBSERVATIONS				
CATALEPSY (seconds)				
GRAND MEAN	0.3	0.4	0.4	0.4
SD	0.11	0.06	0.20	0.12
MIN	0.2	0.3	0.3	0.2
MAX	0.6	0.4	0.6	0.7
BODY TEMPERATURE (ºC)				
GRAND MEAN	38.0	38.4	38.8	38.8
SD	0.65	1.21	0.37	0.59
MIN	36.9	37.5	38.6	37.7
MAX	39.3	39.2	39.1	40.6

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
HOME CAGE OBSERVATIONS				
POSTURE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	77
1 - SITTING OR STANDING NORMALLY	19	1	6	26
2 - ASLEEP, LYING ON SIDE OR CURLED UP	6	3	1	23
3 - ALERT, ORIENTED TOWARD OBSERVER	9	6	3	23
4 - SITTING, HEAD HELD LOW	1	0	0	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	0	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0	0
7 - IMMOBILE	0	0	0	0
8 - REARING	0	0	0	5
9 - SPLAYED HINDLIMBS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - ABSENT	35	10	10	73
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0
CONVULSIONS - TONIC				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - ABSENT	35	10	10	73
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
HOME CAGE OBSERVATIONS				
TREMORS				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NONE	35	10	10	73
2 - SLIGHT (1.5 MM)	0	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
BITING				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NONE	35	10	10	73
2 - BITING OF CAGE	0	0	0	0
3 - BITING OF SELF	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - EYELIDS WIDE OPEN	30	7	9	54
2 - EYELIDS SLIGHTLY DROOPING	0	1	0	4
3 - DROOPING EYELIDS (HALF CLOSED)	2	2	0	2
4 - EYELIDS COMPLETELY SHUT	3	0	1	13
FECES CONSISTENCY				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - PELLETS	26	6	8	40
2 - PELLETS, PARTIALLY FORMED	1	0	0	0
3 - UNFORMED, DIARRHEA	0	0	0	0
4 - PELLETS ABSENT	8	4	2	33

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
EASE OF REMOVAL FROM CAGE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - VERY EASY	38	6	4	42
2 - EASY	7	4	6	19
3 - MODERATELY DIFFICULT	0	0	0	0
4 - FREEZES	0	0	0	0
5 - DIFFICULT	0	0	0	0
6 - VERY DIFFICULT	0	0	0	0
EASE OF HANDLING ANIMAL IN HAND				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - LOW	43	10	8	58
2 - MODERATELY LOW	2	0	2	3
3 - MODERATELY HIGH	0	0	0	0
4 - HIGH	0	0	0	0
LACRIMATION				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - NONE	45	10	10	61
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
CHROMODACRYORRHEA				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - ABSENT	45	10	10	61
2 - PRESENT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
SALIVATION				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - NONE	45	10	10	61
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
PILOERECTION				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - NONE	45	9	10	61
2 - SLIGHT	0	1	0	0
3 - SEVERE	0	0	0	0
FUR APPEARANCE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - NORMAL: CLEAN AND GROOMED	45	10	10	60
2 - SLIGHTLY SOILED	0	0	0	1
3 - VERY SOILED, CRUSTY	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - EYELIDS WIDE OPEN	45	10	10	61
2 - EYELIDS SLIGHTLY DROOPING	0	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
RESPIRATORY RATE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	45	10	10	61
2 - DECREASED: (BELOW 80/MIN.)	0	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0	0
RESPIRATORY CHARACTER				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - NORMAL	45	10	10	61
2 - RALES	0	0	0	0
3 - RETCHING	0	0	0	0
4 - DYSPNEIC	0	0	0	0
5 - GASPING	0	0	0	0
RED DEPOSITS - EYES				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PRESENT	1	0	0	2
2 - ABSENT	44	10	10	59
RED DEPOSITS - NOSE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PRESENT	1	0	0	1
2 - ABSENT	44	10	10	60
RED DEPOSITS - MOUTH				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	45	10	10	61

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
CRUSTY DEPOSITS - EYES				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	45	10	10	61
CRUSTY DEPOSITS - NOSE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	45	10	10	61
CRUSTY DEPOSITS - MOUTH				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	45	10	10	61
MUCOUS MEMBRANES - COLOR				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PINK	45	10	10	61
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
EYES - COLOR				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PINK	45	10	10	61
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
SKIN - COLOR				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - PINK	45	10	10	61
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
EYE PROMINENCE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - NORMAL	45	10	10	61
2 - EXOPHTHALMUS	0	0	0	0
3 - ENOPHTHALMUS	0	0	0	0
MUSCLE TONE				
NUMBER OF STUDIES	7	2	1	5
NUMBER OF ANIMALS TESTED	45	10	10	61
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	45	10	10	61
2 - MUSCLE IS SOFT AND FLABBY	0	0	0	0
3 - MUSCLE IS TENSE AND HARD	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
MOBILITY				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NORMAL	45	10	10	73
2 - SLIGHTLY IMPAIRED	0	0	0	0
3 - MODERATELY IMPAIRED	0	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0	0
GAIT				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NORMAL	45	10	10	73
2 - WALKS ON TIPTOES	0	0	0	0
3 - BODY DRAGS	0	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0	0
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	0	0	0	0
6 - ATAXIA	0	0	0	0
7 - WALKS ON METATARSUS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - ABSENT	45	10	10	73
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
CONVULSIONS - TONIC				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - ABSENT	45	10	10	73
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0
TREMORS				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NONE	45	10	10	73
2 - SLIGHT (1.5 MM)	0	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
GAIT SCORE				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NORMAL	45	10	10	73
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	0	0	0	0
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	0	0	0	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
AROUSAL				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - VERY LOW	1	0	0	0
2 - LOW	4	0	0	2
3 - NORMAL	40	10	10	71
4 - SOMEWHAT HIGH	0	0	0	0
5 - VERY HIGH	0	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NONE	44	10	10	73
2 - HEAD FLICK	0	0	0	0
3 - HEAD SEARCH	0	0	0	0
4 - HALLUCINATORY	0	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0	0
6 - PRANCING	0	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0	0
8 - AIMLESS WANDERING	0	0	0	0
9 - CIRCLING	0	0	0	0
10 - WALTZING	0	0	0	0
11 - RETROPULSION	1	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0	0
15 - VERTICAL JUMPING	0	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0	0
17 - HEAD BOBBING	0	0	0	0
18 - WRITHING	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
TIME TO FIRST STEP (seconds)				
GRAND MEAN	0.5	0.7	0.6	0.4
SD	0.16	0.10	0.00	0.19
MIN	0.2	0.6	0.6	0.2
MAX	0.6	0.7	0.6	0.7
REARING				
GRAND MEAN	5.6	5.4	9.2	6.6
SD	1.87	1.13	0.00	2.17
MIN	2.8	4.6	9.2	3.8
MAX	8.4	6.2	9.2	9.0
BACKING				
GRAND MEAN	0.0	0.0	0.0	0.0
SD	0.08	0.00	0.00	0.00
MIN	0.0	0.0	0.0	0.0
MAX	0.2	0	0.0	0.0
GROOMING				
GRAND MEAN	0.2	0.1	0.0	0.2
SD	0.17	0.14	0.00	0.17
MIN	0.0	0.0	0.0	0.0
MAX	0.4	0.2	0.0	0.5
URINATION				
GRAND MEAN	0.9	0.7	1.8	1.1
SD	0.60	0.42	0.00	0.89
MIN	0.2	0.4	1.8	0.4
MAX	1.8	1	1.8	2.6

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
DEFECATION				
GRAND MEAN	0.8	0.8	0.3	0.7
SD	0.29	1.13	0.00	0.28
MIN	0.4	0.0	0.3	0.2
MAX	1.2	1.6	0.3	1.1

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
SENSORY OBSERVATIONS				
APPROACH RESPONSE				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO REACTION	7	2	0	2
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	38	8	10	71
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
TOUCH RESPONSE				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO REACTION	6	0	1	2
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	39	10	9	71
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
STARTLE RESPONSE				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO REACTION	0	0	1	0
2 - SLIGHT REACTION	38	10	9	70
3 - MORE ENERGETIC RESPONSE THAN (2)	7	0	0	3
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
SENSORY OBSERVATIONS				
TAIL PINCH				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO REACTION	2	0	1	0
2 - ANIMAL MAY TURN OR WALK AWAY	34	9	6	59
3 - MORE ENERGETIC RESPONSE THAN (2)	9	1	3	14
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0	0
OLFACTORY ORIENTATION				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO REACTION PRESENT	2	0	0	5
2 - REACTION PRESENT	43	10	10	68
PUPIL RESPONSE				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO PUPIL RESPONSE	0	0	0	0
2 - PUPIL RESPONSE PRESENT	45	10	10	73
EYEBLINK RESPONSE				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO EYEBLINK RESPONSE	0	0	0	0
2 - EYEBLINK RESPONSE PRESENT	45	10	10	73
FORELIMB EXTENSION				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO FORELIMB EXTENSION	0	0	0	0
2 - FORELIMB EXTENSION PRESENT	45	10	10	73

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
SENSORY OBSERVATIONS				
HINDLIMB EXTENSION				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NO HINDLIMB EXTENSION	0	0	0	0
2 - HINDLIMB EXTENSION PRESENT	45	10	10	73
AIR RIGHTING REFLEX				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - NORMAL	45	10	9	72
2 - SLIGHTLY UNCOORDINATED	0	0	1	1
3 - LANDS ON SIDE	0	0	0	0
4 - LANDS ON BACK	0	0	0	0
NEUROMUSCULAR OBSERVATIONS				
HINDLIMB EXTENSOR STRENGTH				
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
1 - HINDLIMB RESISTANCE ABSENT	0	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	0	0
3 - HINDLIMB RESISTANCE PRESENT	45	10	10	73

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
NEUROMUSCULAR OBSERVATIONS				
GRIPSTRENGTH - HINDLIMB (g)				
GRAND MEAN	515.1	460.1	389.2	542.5
SD	161.83	176.92	0.00	163.91
MIN	380.0	335.0	389.2	337.4
MAX	861.6	585.2	389.2	744.4
GRIPSTRENGTH - FORELIMB (g)				
GRAND MEAN	862.4	614.1	675.8	754.1
SD	229.78	62.37	0.00	205.72
MIN	543.4	570.0	675.8	501.3
MAX	1211.7	658.2	675.8	982.4
ROTAROD PERFORMANCE (seconds)				
GRAND MEAN	81.7	85.3	86.5	84.6
SD	17.46	4.84	0.00	20.87
MIN	69.7	81.9	86.5	57.8
MAX	120.0	88.7	86.5	108.4
HINDLIMB FOOTSPLAY (mm)				
GRAND MEAN	76.8	77.6	66.5	71.6
SD	5.65	0.00	0.00	13.90
MIN	68.8	77.6	66.5	49.8
MAX	85.7	77.6	66.5	88.4

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	7	2	1	6
NUMBER OF ANIMALS TESTED	45	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 15	11 - 13	12 - 12	13 - 15
PHYSIOLOGICAL OBSERVATIONS				
CATALEPSY (seconds)				
GRAND MEAN	0.4	0.3	0.2	0.5
SD	0.12	0.18	0.00	0.40
MIN	0.2	0.2	0.2	0.2
MAX	0.5	0.5	0.2	1.3
BODY TEMPERATURE (ºC)				
GRAND MEAN	38.0	38.3	38.4	37.9
SD	1.07	0.82	0.00	1.06
MIN	36.3	37.7	38.4	36.5
MAX	39.3	38.8	38.4	39.1
BODY WEIGHT (g)				
GRAND MEAN	369.2	412.2	439.9	428.6
SD	23.43	51.73	0.00	22.36
MIN	347.2	375.7	439.9	406.2
MAX	409.5	448.8	439.9	458.3

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
HOME CAGE OBSERVATIONS				
POSTURE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	80
1 - SITTING OR STANDING NORMALLY	15	7	4	30
2 - ASLEEP, LYING ON SIDE OR CURLED UP	2	1	2	6
3 - ALERT, ORIENTED TOWARD OBSERVER	18	1	4	29
4 - SITTING, HEAD HELD LOW	0	0	0	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	0	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0	0
7 - IMMOBILE	0	0	0	0
8 - REARING	0	1	0	15
9 - SPLAYED HINDLIMBS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - ABSENT	35	10	10	73
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0
CONVULSIONS - TONIC				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - ABSENT	35	10	10	73
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
HOME CAGE OBSERVATIONS				
TREMORS				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NONE	35	10	10	73
2 - SLIGHT (1.5 MM)	0	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
BITING				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NONE	34	10	10	72
2 - BITING OF CAGE	0	0	0	1
3 - BITING OF SELF	1	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - EYELIDS WIDE OPEN	32	9	8	68
2 - EYELIDS SLIGHTLY DROOPING	1	0	0	2
3 - DROOPING EYELIDS (HALF CLOSED)	0	1	0	0
4 - EYELIDS COMPLETELY SHUT	2	0	2	3
FECES CONSISTENCY				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - PELLETS	15	5	9	25
2 - PELLETS, PARTIALLY FORMED	0	0	0	0
3 - UNFORMED, DIARRHEA	0	0	0	0
4 - PELLETS ABSENT	20	5	1	48

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
EASE OF REMOVAL FROM CAGE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - VERY EASY	27	4	6	39
2 - EASY	8	6	4	21
3 - MODERATELY DIFFICULT	0	0	0	1
4 - FREEZES	0	0	0	0
5 - DIFFICULT	0	0	0	0
6 - VERY DIFFICULT	0	0	0	0
EASE OF HANDLING ANIMAL IN HAND				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - LOW	33	10	9	60
2 - MODERATELY LOW	2	0	1	1
3 - MODERATELY HIGH	0	0	0	0
4 - HIGH	0	0	0	0
LACRIMATION				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - NONE	35	10	10	61
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
CHROMODACRYORRHEA				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - ABSENT	35	10	10	61
2 - PRESENT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
SALIVATION				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - NONE	35	10	10	61
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
PILOERECTION				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - NONE	35	10	10	61
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
FUR APPEARANCE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - NORMAL: CLEAN AND GROOMED	35	10	10	56
2 - SLIGHTLY SOILED	0	0	0	5
3 - VERY SOILED, CRUSTY	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - EYELIDS WIDE OPEN	35	10	10	61
2 - EYELIDS SLIGHTLY DROOPING	0	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
RESPIRATORY RATE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	35	10	10	61
2 - DECREASED: (BELOW 80/MIN.)	0	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0	0
RESPIRATORY CHARACTER				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - NORMAL	35	10	10	61
2 - RALES	0	0	0	0
3 - RETCHING	0	0	0	0
4 - DYSPNEIC	0	0	0	0
5 - GASPING	0	0	0	0
RED DEPOSITS - EYES				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	35	10	10	61
RED DEPOSITS - NOSE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	35	10	10	61
RED DEPOSITS - MOUTH				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	35	10	10	61

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
CRUSTY DEPOSITS - EYES				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	35	10	10	61
CRUSTY DEPOSITS - NOSE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	35	10	10	61
CRUSTY DEPOSITS - MOUTH				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PRESENT	0	0	0	0
2 - ABSENT	35	10	10	61
MUCOUS MEMBRANES - COLOR				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PINK	35	10	10	60
2 - PALE	0	0	0	1
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
HANDLING OBSERVATIONS				
EYES - COLOR				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PINK	35	10	10	61
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
SKIN - COLOR				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - PINK	35	10	10	61
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
EYE PROMINENCE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - NORMAL	35	10	10	61
2 - EXOPHTHALMUS	0	0	0	0
3 - ENOPHTHALMUS	0	0	0	0
MUSCLE TONE				
NUMBER OF STUDIES	6	2	1	5
NUMBER OF ANIMALS TESTED	35	10	10	61
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	35	10	10	61
2 - MUSCLE IS SOFT AND FLABBY	0	0	0	0
3 - MUSCLE IS TENSE AND HARD	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
MOBILITY				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NORMAL	35	10	10	73
2 - SLIGHTLY IMPAIRED	0	0	0	0
3 - MODERATELY IMPAIRED	0	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0	0
GAIT				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NORMAL	35	10	10	73
2 - WALKS ON TIPTOES	0	0	0	0
3 - BODY DRAGS	0	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0	0
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	0	0	0	0
6 - ATAXIA	0	0	0	0
7 - WALKS ON METATARSUS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - ABSENT	35	10	10	73
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
CONVULSIONS - TONIC				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - ABSENT	35	10	10	73
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0
TREMORS				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NONE	35	10	10	73
2 - SLIGHT (1.5 MM)	0	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
GAIT SCORE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NORMAL	35	10	9	73
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	0	0	0	0
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	0	0	1	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
AROUSAL				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - VERY LOW	0	0	0	0
2 - LOW	0	0	0	0
3 - NORMAL	35	9	10	71
4 - SOMEWHAT HIGH	0	1	0	2
5 - VERY HIGH	0	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NONE	35	10	10	73
2 - HEAD FLICK	0	0	0	0
3 - HEAD SEARCH	0	0	0	0
4 - HALLUCINATORY	0	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0	0
6 - PRANCING	0	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0	0
8 - AIMLESS WANDERING	0	0	0	0
9 - CIRCLING	0	0	0	0
10 - WALTZING	0	0	0	0
11 - RETROPULSION	0	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0	0
15 - VERTICAL JUMPING	0	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0	0
17 - HEAD BOBBING	0	0	0	0
18 - WRITHING	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
TIME TO FIRST STEP (seconds)				
GRAND MEAN	0.4	0.3	0.5	0.3
SD	0.12	0.04	0.00	0.08
MIN	0.2	0.3	0.5	0.2
MAX	0.5	0.3	0.5	0.4
REARING				
GRAND MEAN	11.5	9.2	11.6	11.4
SD	3.04	0.00	0.00	2.85
MIN	7.2	9.2	11.6	7.7
MAX	15.8	9.2	11.6	15.2
BACKING				
GRAND MEAN	0.0	0.0	0.0	0.0
SD	0.00	0.00	0.00	0.00
MIN	0.0	0.0	0.0	0.0
MAX	0.0	0	0.0	0.0
GROOMING				
GRAND MEAN	0.2	1.0	0.1	0.2
SD	0.36	1.13	0.00	0.26
MIN	0.0	0.2	0.1	0.0
MAX	0.9	1.8	0.1	0.7
URINATION				
GRAND MEAN	0.2	0.0	1.2	0.2
SD	0.20	0.00	0.00	0.18
MIN	0.0	0.0	1.2	0.0
MAX	0.4	0	1.2	0.5

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
OPEN FIELD OBSERVATIONS				
DEFECATION				
GRAND MEAN	0.0	0.2	0.0	0.1
SD	0.00	0.28	0.00	0.09
MIN	0.0	0.0	0.0	0.0
MAX	0.0	0.4	0.0	0.2

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
SENSORY OBSERVATIONS				
APPROACH RESPONSE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO REACTION	4	2	0	0
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	30	7	10	71
3 - MORE ENERGETIC RESPONSE THAN (2)	1	1	0	2
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
TOUCH RESPONSE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO REACTION	2	1	0	0
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	32	9	10	72
3 - MORE ENERGETIC RESPONSE THAN (2)	1	0	0	1
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
STARTLE RESPONSE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO REACTION	1	0	4	0
2 - SLIGHT REACTION	27	10	6	69
3 - MORE ENERGETIC RESPONSE THAN (2)	7	0	0	4
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
SENSORY OBSERVATIONS				
TAIL PINCH				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO REACTION	1	0	0	0
2 - ANIMAL MAY TURN OR WALK AWAY	29	6	5	69
3 - MORE ENERGETIC RESPONSE THAN (2)	5	4	5	4
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0	0
OLFACTORY ORIENTATION				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO REACTION PRESENT	1	0	0	3
2 - REACTION PRESENT	34	10	10	70
PUPIL RESPONSE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO PUPIL RESPONSE	0	0	0	0
2 - PUPIL RESPONSE PRESENT	35	10	10	73
EYEBLINK RESPONSE				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO EYEBLINK RESPONSE	0	0	0	0
2 - EYEBLINK RESPONSE PRESENT	35	10	10	73
FORELIMB EXTENSION				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO FORELIMB EXTENSION	0	1	0	0
2 - FORELIMB EXTENSION PRESENT	35	9	10	73

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
SENSORY OBSERVATIONS				
HINDLIMB EXTENSION				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NO HINDLIMB EXTENSION	0	1	1	0
2 - HINDLIMB EXTENSION PRESENT	35	9	9	73
AIR RIGHTING REFLEX				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - NORMAL	35	10	10	72
2 - SLIGHTLY UNCOORDINATED	0	0	0	1
3 - LANDS ON SIDE	0	0	0	0
4 - LANDS ON BACK	0	0	0	0
NEUROMUSCULAR OBSERVATIONS				
HINDLIMB EXTENSOR STRENGTH				
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
1 - HINDLIMB RESISTANCE ABSENT	0	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	0	0
3 - HINDLIMB RESISTANCE PRESENT	35	10	10	73

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
NEUROMUSCULAR OBSERVATIONS				
GRIPSTRENGTH - HINDLIMB (g)				
GRAND MEAN	478.3	427.4	288.3	463.5
SD	144.53	170.84	0.00	144.26
MIN	301.6	306.6	288.3	287.3
MAX	729.8	548.2	288.3	671.6
GRIPSTRENGTH - FORELIMB (g)				
GRAND MEAN	658.6	543.2	651.6	680.9
SD	169.93	145.95	0.00	201.72
MIN	415.0	440.0	651.6	396.5
MAX	876.6	646.4	651.6	904.7
ROTAROD PERFORMANCE (seconds)				
GRAND MEAN	84.4	87.8	76.1	97.7
SD	20.29	15.00	0.00	11.43
MIN	52.7	77.1	76.1	83.6
MAX	102.9	98.4	76.1	112.3
HINDLIMB FOOTSPLAY (mm)				
GRAND MEAN	60.1	69.9	58.6	64.0
SD	12.43	14.00	0.00	8.67
MIN	44.0	60.0	58.6	54.3
MAX	71.9	79.8	58.6	74.1

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	4	5	6	7
NUMBER OF STUDIES	6	2	1	6
NUMBER OF ANIMALS TESTED	35	10	10	73
AGE RANGE OF ANIMALS TESTED	10 - 11	11 - 13	12 - 12	13 - 15
PHYSIOLOGICAL OBSERVATIONS				
CATALEPSY (seconds)				
GRAND MEAN	0.3	0.4	0.2	0.4
SD	0.12	0.18	0.00	0.12
MIN	0.2	0.2	0.2	0.2
MAX	0.4	0.5	0.2	0.5
BODY TEMPERATURE (ºC)				
GRAND MEAN	38.6	39.0	38.8	38.7
SD	0.71	0.35	0.00	0.75
MIN	37.3	38.8	38.8	37.5
MAX	39.1	39.3	38.8	39.6
BODY WEIGHT (g)				
GRAND MEAN	235.1	250.1	258.6	255.0
SD	8.76	5.71	0.00	3.70
MIN	219.0	246.0	258.6	250.7
MAX	245.0	254.1	258.6	259.3

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HOME CAGE OBSERVATIONS				
POSTURE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	155	11
1 - SITTING OR STANDING NORMALLY	0	8	81	6
2 - ASLEEP, LYING ON SIDE OR CURLED UP	9	0	38	1
3 - ALERT, ORIENTED TOWARD OBSERVER	0	1	29	3
4 - SITTING, HEAD HELD LOW	0	0	1	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	0	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0	0
7 - IMMOBILE	0	0	0	0
8 - REARING	0	0	6	1
9 - SPLAYED HINDLIMBS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - ABSENT	9	9	151	10
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0
CONVULSIONS - TONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - ABSENT	9	9	151	10
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HOME CAGE OBSERVATIONS				
TREMORS				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NONE	9	9	151	10
2 - SLIGHT (1.5 MM)	0	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
BITING				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NONE	9	9	151	10
2 - BITING OF CAGE	0	0	0	0
3 - BITING OF SELF	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - EYELIDS WIDE OPEN	3	9	108	8
2 - EYELIDS SLIGHTLY DROOPING	0	0	5	0
3 - DROOPING EYELIDS (HALF CLOSED)	2	0	8	1
4 - EYELIDS COMPLETELY SHUT	4	0	30	1
FECES CONSISTENCY				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - PELLETS	6	0	80	9
2 - PELLETS, PARTIALLY FORMED	0	0	1	0
3 - UNFORMED, DIARRHEA	0	0	0	0
4 - PELLETS ABSENT	3	9	70	1

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
EASE OF REMOVAL FROM CAGE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - VERY EASY	4	9	123	8
2 - EASY	5	0	14	2
3 - MODERATELY DIFFICULT	0	0	1	0
4 - FREEZES	0	0	0	0
5 - DIFFICULT	0	0	0	0
6 - VERY DIFFICULT	0	0	1	0
EASE OF HANDLING ANIMAL IN HAND				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - LOW	8	7	127	10
2 - MODERATELY LOW	1	2	11	0
3 - MODERATELY HIGH	0	0	0	0
4 - HIGH	0	0	1	0
LACRIMATION				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - NONE	9	7	139	10
2 - SLIGHT	0	2	0	0
3 - SEVERE	0	0	0	0
CHROMODACRYORRHEA				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	8	139	10
1 - ABSENT	9	8	139	10
2 - PRESENT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
SALIVATION				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - NONE	9	9	138	10
2 - SLIGHT	0	0	1	0
3 - SEVERE	0	0	0	0
PILOERECTION				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - NONE	9	9	134	10
2 - SLIGHT	0	0	5	0
3 - SEVERE	0	0	0	0
FUR APPEARANCE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - NORMAL: CLEAN AND GROOMED	9	9	133	10
2 - SLIGHTLY SOILED	0	0	6	0
3 - VERY SOILED, CRUSTY	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - EYELIDS WIDE OPEN	9	9	139	10
2 - EYELIDS SLIGHTLY DROOPING	0	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
RESPIRATORY RATE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	9	9	139	10
2 - DECREASED: (BELOW 80/MIN.)	0	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0	0
RESPIRATORY CHARACTER				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - NORMAL	9	9	139	10
2 - RALES	0	0	0	0
3 - RETCHING	0	0	0	0
4 - DYSPNEIC	0	0	0	0
5 - GASPING	0	0	0	0
RED DEPOSITS - EYES				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PRESENT	0	0	6	0
2 - ABSENT	9	9	133	10
RED DEPOSITS - NOSE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PRESENT	0	0	4	0
2 - ABSENT	9	9	135	10
RED DEPOSITS - MOUTH				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PRESENT	0	0	0	0
2 - ABSENT	9	9	139	10

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
CRUSTY DEPOSITS - EYES				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PRESENT	0	3	4	0
2 - ABSENT	9	6	135	10
CRUSTY DEPOSITS - NOSE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PRESENT	0	6	6	0
2 - ABSENT	9	3	133	10
CRUSTY DEPOSITS - MOUTH				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PRESENT	0	0	0	0
2 - ABSENT	9	9	139	10
MUCOUS MEMBRANES - COLOR				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PINK	9	9	139	10
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
EYES - COLOR				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PINK	9	9	139	10
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
SKIN - COLOR				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - PINK	9	9	139	10
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
EYE PROMINENCE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - NORMAL	9	9	138	10
2 - EXOPHTHALMUS	0	0	1	0
3 - ENOPHTHALMUS	0	0	0	0
MUSCLE TONE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	9	9	139	10
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	9	9	139	10
2 - MUSCLE IS SOFT AND FLABBY	0	0	0	0
3 - MUSCLE IS TENSE AND HARD	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
MOBILITY				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NORMAL	9	9	151	10
2 - SLIGHTLY IMPAIRED	0	0	0	0
3 - MODERATELY IMPAIRED	0	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0	0
GAIT				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NORMAL	9	9	151	10
2 - WALKS ON TIPTOES	0	0	0	0
3 - BODY DRAGS	0	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0	0
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	0	0	0	0
6 - ATAXIA	0	0	0	0
7 - WALKS ON METATARSUS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - ABSENT	9	9	151	10
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
CONVULSIONS - TONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - ABSENT	9	9	151	10
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0
TREMORS				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NONE	9	9	150	10
2 - SLIGHT (1.5 MM)	0	0	1	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
GAIT SCORE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NORMAL	9	9	151	10
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	0	0	0	0
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	0	0	0	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
AROUSAL				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - VERY LOW	0	0	0	0
2 - LOW	0	0	7	0
3 - NORMAL	9	9	144	10
4 - SOMEWHAT HIGH	0	0	0	0
5 - VERY HIGH	0	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NONE	9	9	151	10
2 - HEAD FLICK	0	0	0	0
3 - HEAD SEARCH	0	0	0	0
4 - HALLUCINATORY	0	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0	0
6 - PRANCING	0	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0	0
8 - AIMLESS WANDERING	0	0	0	0
9 - CIRCLING	0	0	0	0
10 - WALTZING	0	0	0	0
11 - RETROPULSION	0	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0	0
15 - VERTICAL JUMPING	0	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0	0
17 - HEAD BOBBING	0	0	0	0
18 - WRITHING	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
TIME TO FIRST STEP (seconds)				
GRAND MEAN	0.6	0.9	0.4	0.5
SD	0.00	0.00	0.18	0.00
MIN	0.6	0.9	0.3	0.5
MAX	0.6	0.9	1.0	0.5
REARING				
GRAND MEAN	7.3	7.8	6.1	7.7
SD	0.00	0.00	1.89	0.00
MIN	7.3	7.8	3.3	7.7
MAX	7.3	7.8	9.6	7.7
BACKING				
GRAND MEAN	0.0	0.0	0.1	0.0
SD	0.00	0.00	0.27	0.00
MIN	0.0	0.0	0.0	0.0
MAX	0.0	0	1.0	0.0
GROOMING				
GRAND MEAN	0.4	0.0	0.3	0.2
SD	0.00	0.00	0.21	0.00
MIN	0.4	0.0	0.0	0.2
MAX	0.4	0	0.6	0.2
URINATION				
GRAND MEAN	0.3	0.2	0.9	1.2
SD	0.00	0.00	0.49	0.00
MIN	0.3	0.2	0.2	1.2
MAX	0.3	0.2	1.8	1.2

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
DEFECATION				
GRAND MEAN	0.2	0.0	0.8	1.1
SD	0.00	0.00	0.70	0.00
MIN	0.2	0.0	0.2	1.1
MAX	0.2	0	2.3	1.1

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
SENSORY OBSERVATIONS				
APPROACH RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO REACTION	0	0	17	0
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	9	9	134	10
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
TOUCH RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO REACTION	0	0	2	2
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	9	9	148	8
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	1	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
STARTLE RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO REACTION	0	0	1	0
2 - SLIGHT REACTION	9	9	148	10
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	2	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
SENSORY OBSERVATIONS				
TAIL PINCH				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO REACTION	0	0	7	0
2 - ANIMAL MAY TURN OR WALK AWAY	9	9	121	8
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	23	2
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0	0
OLFACTORY ORIENTATION				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO REACTION PRESENT	0	0	1	0
2 - REACTION PRESENT	9	9	150	10
PUPIL RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO PUPIL RESPONSE	0	1	0	0
2 - PUPIL RESPONSE PRESENT	9	8	151	10
EYEBLINK RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO EYEBLINK RESPONSE	0	0	0	0
2 - EYEBLINK RESPONSE PRESENT	9	9	151	10
FORELIMB EXTENSION				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO FORELIMB EXTENSION	0	0	1	0
2 - FORELIMB EXTENSION PRESENT	9	9	150	10

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
SENSORY OBSERVATIONS				
HINDLIMB EXTENSION				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NO HINDLIMB EXTENSION	0	0	0	0
2 - HINDLIMB EXTENSION PRESENT	9	9	151	10
AIR RIGHTING REFLEX				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - NORMAL	9	9	146	10
2 - SLIGHTLY UNCOORDINATED	0	0	4	0
3 - LANDS ON SIDE	0	0	1	0
4 - LANDS ON BACK	0	0	0	0
NEUROMUSCULAR OBSERVATIONS				
HINDLIMB EXTENSOR STRENGTH				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
1 - HINDLIMB RESISTANCE ABSENT	0	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	0	0
3 - HINDLIMB RESISTANCE PRESENT	9	9	151	10

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
NEUROMUSCULAR OBSERVATIONS				
GRIPSTRENGTH - HINDLIMB (g)				
GRAND MEAN	310.7	302.8	551.8	571.6
SD	0.00	0.00	169.85	0.00
MIN	310.7	302.8	340.7	571.6
MAX	310.7	302.8	1005.0	571.6
GRIPSTRENGTH - FORELIMB (g)				
GRAND MEAN	993.7	533.9	974.2	741.8
SD	0.00	0.00	218.89	0.00
MIN	993.7	533.9	640.2	741.8
MAX	993.7	533.9	1272.5	741.8
ROTAROD PERFORMANCE (seconds)				
GRAND MEAN	20.3	24.7	57.1	50.9
SD	0.00	0.00	23.83	0.00
MIN	20.3	24.7	9.1	50.9
MAX	20.3	24.7	92.9	50.9
HINDLIMB FOOTSPLAY (mm)				
GRAND MEAN	79.2	86.2	71.5	61.4
SD	0.00	0.00	16.65	0.00
MIN	79.2	86.2	44.2	61.4
MAX	79.2	86.2	102.0	61.4

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	9	151	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
PHYSIOLOGICAL OBSERVATIONS				
CATALEPSY (seconds)				
GRAND MEAN	0.4	0.5	0.6	0.5
SD	0.00	0.00	0.20	0.00
MIN	0.4	0.5	0.2	0.5
MAX	0.4	0.5	0.9	0.5
BODY TEMPERATURE (ºC)				
GRAND MEAN	37.5	38.3	37.4	36.4
SD	0.00	0.00	1.19	0.00
MIN	37.5	38.3	35.2	36.4
MAX	37.5	38.3	38.9	36.4

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HOME CAGE OBSERVATIONS				
POSTURE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	166	11
1 - SITTING OR STANDING NORMALLY	5	4	95	6
2 - ASLEEP, LYING ON SIDE OR CURLED UP	5	0	18	1
3 - ALERT, ORIENTED TOWARD OBSERVER	0	5	38	3
4 - SITTING, HEAD HELD LOW	0	1	0	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	0	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0	0
7 - IMMOBILE	0	0	0	0
8 - REARING	0	0	15	1
9 - SPLAYED HINDLIMBS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - ABSENT	10	10	153	10
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0
CONVULSIONS - TONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - ABSENT	10	10	153	10
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HOME CAGE OBSERVATIONS				
TREMORS				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - NONE	10	10	152	10
2 - SLIGHT (1.5 MM)	0	0	1	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
BITING				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - NONE	10	10	152	10
2 - BITING OF CAGE	0	0	1	0
3 - BITING OF SELF	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - EYELIDS WIDE OPEN	6	9	132	9
2 - EYELIDS SLIGHTLY DROOPING	0	1	5	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	4	0
4 - EYELIDS COMPLETELY SHUT	4	0	12	1
FECES CONSISTENCY				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - PELLETS	7	0	89	4
2 - PELLETS, PARTIALLY FORMED	0	0	1	0
3 - UNFORMED, DIARRHEA	0	0	0	0
4 - PELLETS ABSENT	3	10	63	6

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
EASE OF REMOVAL FROM CAGE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - VERY EASY	7	8	131	10
2 - EASY	3	2	8	0
3 - MODERATELY DIFFICULT	0	0	2	0
4 - FREEZES	0	0	0	0
5 - DIFFICULT	0	0	0	0
6 - VERY DIFFICULT	0	0	0	0
EASE OF HANDLING ANIMAL IN HAND				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - LOW	9	7	129	10
2 - MODERATELY LOW	1	3	12	0
3 - MODERATELY HIGH	0	0	0	0
4 - HIGH	0	0	0	0
LACRIMATION				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - NONE	10	6	141	10
2 - SLIGHT	0	4	0	0
3 - SEVERE	0	0	0	0
CHROMODACRYORRHEA				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - ABSENT	10	10	141	10
2 - PRESENT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
SALIVATION				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - NONE	10	10	141	10
2 - SLIGHT	0	0	0	0
3 - SEVERE	0	0	0	0
PILOERECTION				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - NONE	10	10	139	10
2 - SLIGHT	0	0	2	0
3 - SEVERE	0	0	0	0
FUR APPEARANCE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - NORMAL: CLEAN AND GROOMED	10	9	140	10
2 - SLIGHTLY SOILED	0	1	1	0
3 - VERY SOILED, CRUSTY	0	0	0	0
PALPEBRAL CLOSURE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - EYELIDS WIDE OPEN	10	10	141	10
2 - EYELIDS SLIGHTLY DROOPING	0	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
RESPIRATORY RATE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	10	10	141	10
2 - DECREASED: (BELOW 80/MIN.)	0	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0	0
RESPIRATORY CHARACTER				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - NORMAL	10	10	141	10
2 - RALES	0	0	0	0
3 - RETCHING	0	0	0	0
4 - DYSPNEIC	0	0	0	0
5 - GASPING	0	0	0	0
RED DEPOSITS - EYES				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PRESENT	0	0	1	0
2 - ABSENT	10	10	140	10
RED DEPOSITS - NOSE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PRESENT	0	0	2	0
2 - ABSENT	10	10	139	10
RED DEPOSITS - MOUTH				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PRESENT	0	0	0	0
2 - ABSENT	10	10	141	10

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
CRUSTY DEPOSITS - EYES				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PRESENT	0	7	0	0
2 - ABSENT	10	3	141	10
CRUSTY DEPOSITS - NOSE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PRESENT	0	3	3	0
2 - ABSENT	10	7	138	10
CRUSTY DEPOSITS - MOUTH				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PRESENT	0	0	0	0
2 - ABSENT	10	10	141	10
MUCOUS MEMBRANES - COLOR				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PINK	10	10	141	10
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
HANDLING OBSERVATIONS				
EYES - COLOR				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PINK	10	10	141	10
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
SKIN - COLOR				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - PINK	10	10	141	10
2 - PALE	0	0	0	0
3 - DARKENED	0	0	0	0
4 - DARKENED, BROWN	0	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0	0
EYE PROMINENCE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - NORMAL	10	10	138	10
2 - EXOPHTHALMUS	0	0	3	0
3 - ENOPHTHALMUS	0	0	0	0
MUSCLE TONE				
NUMBER OF STUDIES	1	1	13	1
NUMBER OF ANIMALS TESTED	10	10	141	10
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	10	10	139	10
2 - MUSCLE IS SOFT AND FLABBY	0	0	0	0
3 - MUSCLE IS TENSE AND HARD	0	0	2	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
MOBILITY				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - NORMAL	10	10	153	10
2 - SLIGHTLY IMPAIRED	0	0	0	0
3 - MODERATELY IMPAIRED	0	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0	0
GAIT				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	155	10
1 - NORMAL	10	10	152	10
2 - WALKS ON TIPTOES	0	0	1	0
3 - BODY DRAGS	0	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0	0
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	0	0	2	0
6 - ATAXIA	0	0	0	0
7 - WALKS ON METATARSUS	0	0	0	0
CONVULSIONS - CLONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - ABSENT	10	10	153	10
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0	0
4 - WHOLE BODY TREMORS	0	0	0	0
5 - CLONIC CONVULSIONS	0	0	0	0
6 - WET DOG SHAKES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
CONVULSIONS - TONIC				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - ABSENT	10	10	153	10
2 - TONIC	0	0	0	0
3 - OPISTHOTONUS	0	0	0	0
4 - EMPROSTHOTONUS	0	0	0	0
5 - ASPHYXIAL	0	0	0	0
TREMORS				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - NONE	10	10	153	10
2 - SLIGHT (1.5 MM)	0	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0	0
GAIT SCORE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - NORMAL	10	10	153	10
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	0	0	0	0
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	0	0	0	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
AROUSAL				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	152	10
1 - VERY LOW	0	0	0	0
2 - LOW	0	0	1	0
3 - NORMAL	10	9	151	10
4 - SOMEWHAT HIGH	0	1	0	0
5 - VERY HIGH	0	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - NONE	10	10	153	10
2 - HEAD FLICK	0	0	0	0
3 - HEAD SEARCH	0	0	0	0
4 - HALLUCINATORY	0	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0	0
6 - PRANCING	0	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0	0
8 - AIMLESS WANDERING	0	0	0	0
9 - CIRCLING	0	0	0	0
10 - WALTZING	0	0	0	0
11 - RETROPULSION	0	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0	0
15 - VERTICAL JUMPING	0	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0	0
17 - HEAD BOBBING	0	0	0	0
18 - WRITHING	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
TIME TO FIRST STEP (seconds)				
GRAND MEAN	0.6	0.6	0.4	0.4
SD	0.00	0.00	0.11	0.00
MIN	0.6	0.6	0.3	0.4
MAX	0.6	0.6	0.7	0.4
REARING				
GRAND MEAN	10.3	11.2	10.8	13.4
SD	0.00	0.00	2.26	0.00
MIN	10.3	11.2	6.0	13.4
MAX	10.3	11.2	14.2	13.4
BACKING				
GRAND MEAN	0.0	0.0	0.0	0.0
SD	0.00	0.00	0.00	0.00
MIN	0.0	0.0	0.0	0.0
MAX	0.0	0	0.0	0.0
GROOMING				
GRAND MEAN	0.1	0.2	0.3	1.2
SD	0.00	0.00	0.27	0.00
MIN	0.1	0.2	0.0	1.2
MAX	0.1	0.2	0.8	1.2
URINATION				
GRAND MEAN	0.6	0.4	0.3	0.5
SD	0.00	0.00	0.23	0.00
MIN	0.6	0.4	0.0	0.5
MAX	0.6	0.4	0.7	0.5

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
OPEN FIELD OBSERVATIONS				
DEFECATION				
GRAND MEAN	0.3	0.1	0.1	0.0
SD	0.00	0.00	0.21	0.00
MIN	0.3	0.1	0.0	0.0
MAX	0.3	0.1	0.7	0.0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
SENSORY OBSERVATIONS				
APPROACH RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO REACTION	0	0	10	0
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	9	10	143	10
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
TOUCH RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO REACTION	0	0	8	0
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	9	10	145	10
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0	0
STARTLE RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO REACTION	0	0	1	0
2 - SLIGHT REACTION	9	10	149	10
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	3	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
SENSORY OBSERVATIONS				
TAIL PINCH				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO REACTION	0	0	12	0
2 - ANIMAL MAY TURN OR WALK AWAY	8	8	121	10
3 - MORE ENERGETIC RESPONSE THAN (2)	1	2	20	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0	0
OLFACTORY ORIENTATION				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO REACTION PRESENT	0	0	1	0
2 - REACTION PRESENT	9	10	152	10
PUPIL RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO PUPIL RESPONSE	0	0	1	0
2 - PUPIL RESPONSE PRESENT	9	10	152	10
EYEBLINK RESPONSE				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO EYEBLINK RESPONSE	0	0	0	0
2 - EYEBLINK RESPONSE PRESENT	9	10	153	10
FORELIMB EXTENSION				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO FORELIMB EXTENSION	0	0	0	0
2 - FORELIMB EXTENSION PRESENT	9	10	153	10

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
SENSORY OBSERVATIONS				
HINDLIMB EXTENSION				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NO HINDLIMB EXTENSION	0	1	0	0
2 - HINDLIMB EXTENSION PRESENT	9	9	153	10
AIR RIGHTING REFLEX				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	9	10	153	10
1 - NORMAL	9	10	151	10
2 - SLIGHTLY UNCOORDINATED	0	0	1	0
3 - LANDS ON SIDE	0	0	1	0
4 - LANDS ON BACK	0	0	0	0
NEUROMUSCULAR OBSERVATIONS				
HINDLIMB EXTENSOR STRENGTH				
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
1 - HINDLIMB RESISTANCE ABSENT	0	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	0	0
3 - HINDLIMB RESISTANCE PRESENT	10	10	153	10

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
NEUROMUSCULAR OBSERVATIONS				
GRIPSTRENGTH - HINDLIMB (g)				
GRAND MEAN	252.5	274.9	466.3	429.2
SD	0.00	0.00	137.66	0.00
MIN	252.5	274.9	300.8	429.2
MAX	252.5	274.9	717.3	429.2
GRIPSTRENGTH - FORELIMB (g)				
GRAND MEAN	767.0	492.2	792.4	542.6
SD	0.00	0.00	138.35	0.00
MIN	767.0	492.2	521.0	542.6
MAX	767.0	492.2	999.3	542.6
ROTAROD PERFORMANCE (seconds)				
GRAND MEAN	31.1	83.3	79.3	69.8
SD	0.00	0.00	26.75	0.00
MIN	31.1	83.3	34.3	69.8
MAX	31.1	83.3	111.6	69.8
HINDLIMB FOOTSPLAY (mm)				
GRAND MEAN	54.2	64.2	58.1	56.4
SD	0.00	0.00	10.14	0.00
MIN	54.2	64.2	40.5	56.4
MAX	54.2	64.2	73.1	56.4

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	10	11	12	13
NUMBER OF STUDIES	1	1	14	1
NUMBER OF ANIMALS TESTED	10	10	153	10
AGE RANGE OF ANIMALS TESTED	19 - 19	20 - 20	18 - 20	20 - 20
PHYSIOLOGICAL OBSERVATIONS				
CATALEPSY (seconds)				
GRAND MEAN	0.3	0.4	0.4	0.5
SD	0.00	0.00	0.15	0.00
MIN	0.3	0.4	0.2	0.5
MAX	0.3	0.4	0.8	0.5
BODY TEMPERATURE (ºC)				
GRAND MEAN	38.5	38.8	38.2	37.9
SD	0.00	0.00	0.81	0.00
MIN	38.5	38.8	36.8	37.9
MAX	38.5	38.8	39.5	37.9

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HOME CAGE OBSERVATIONS			
POSTURE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - SITTING OR STANDING NORMALLY	5	22	7
2 - ASLEEP, LYING ON SIDE OR CURLED UP	3	3	2
3 - ALERT, ORIENTED TOWARD OBSERVER	2	5	0
4 - SITTING, HEAD HELD LOW	0	0	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0
7 - IMMOBILE	0	0	0
8 - REARING	0	0	0
9 - SPLAYED HINDLIMBS	0	0	0
CONVULSIONS - CLONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - ABSENT	10	30	9
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0
4 - WHOLE BODY TREMORS	0	0	0
5 - CLONIC CONVULSIONS	0	0	0
6 - WET DOG SHAKES	0	0	0
CONVULSIONS - TONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - ABSENT	10	30	9
2 - TONIC	0	0	0
3 - OPISTHOTONUS	0	0	0
4 - EMPROSTHOTONUS	0	0	0
5 - ASPHYXIAL	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HOME CAGE OBSERVATIONS			
TREMORS			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NONE	10	30	9
2 - SLIGHT (1.5 MM)	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0
BITING			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NONE	10	30	9
2 - BITING OF CAGE	0	0	0
3 - BITING OF SELF	0	0	0
PALPEBRAL CLOSURE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - EYELIDS WIDE OPEN	6	26	7
2 - EYELIDS SLIGHTLY DROOPING	1	2	0
3 - DROOPING EYELIDS (HALF CLOSED)	2	1	0
4 - EYELIDS COMPLETELY SHUT	1	1	2
FECES CONSISTENCY			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PELLETS	4	23	4
2 - PELLETS, PARTIALLY FORMED	0	0	0
3 - UNFORMED, DIARRHEA	0	0	0
4 - PELLETS ABSENT	6	7	5

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
EASE OF REMOVAL FROM CAGE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - VERY EASY	10	29	7
2 - EASY	0	0	2
3 - MODERATELY DIFFICULT	0	1	0
4 - FREEZES	0	0	0
5 - DIFFICULT	0	0	0
6 - VERY DIFFICULT	0	0	0
EASE OF HANDLING ANIMAL IN HAND			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	8
1 - LOW	10	29	5
2 - MODERATELY LOW	0	1	3
3 - MODERATELY HIGH	0	0	0
4 - HIGH	0	0	0
LACRIMATION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NONE	10	30	9
2 - SLIGHT	0	0	0
3 - SEVERE	0	0	0
CHROMODACRYORRHEA			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - ABSENT	10	30	9
2 - PRESENT	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
SALIVATION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NONE	10	30	9
2 - SLIGHT	0	0	0
3 - SEVERE	0	0	0
PILOERECTION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NONE	10	30	8
2 - SLIGHT	0	0	1
3 - SEVERE	0	0	0
FUR APPEARANCE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL: CLEAN AND GROOMED	8	30	6
2 - SLIGHTLY SOILED	2	0	3
3 - VERY SOILED, CRUSTY	0	0	0
PALPEBRAL CLOSURE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - EYELIDS WIDE OPEN	10	30	9
2 - EYELIDS SLIGHTLY DROOPING	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
RESPIRATORY RATE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	10	30	9
2 - DECREASED: (BELOW 80/MIN.)	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0
RESPIRATORY CHARACTER			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL	10	30	9
2 - RALES	0	0	0
3 - RETCHING	0	0	0
4 - DYSPNEIC	0	0	0
5 - GASPING	0	0	0
RED DEPOSITS - EYES			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PRESENT	1	0	0
2 - ABSENT	9	30	9
RED DEPOSITS - NOSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PRESENT	0	1	0
2 - ABSENT	10	29	9
RED DEPOSITS - MOUTH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PRESENT	0	0	0
2 - ABSENT	10	30	9

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
CRUSTY DEPOSITS - EYES			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PRESENT	1	0	0
2 - ABSENT	9	30	9
CRUSTY DEPOSITS - NOSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PRESENT	0	0	3
2 - ABSENT	10	30	6
CRUSTY DEPOSITS - MOUTH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PRESENT	0	0	0
2 - ABSENT	10	30	9
MUCOUS MEMBRANES - COLOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PINK	10	30	9
2 - PALE	0	0	0
3 - DARKENED	0	0	0
4 - DARKENED, BROWN	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
EYES - COLOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PINK	10	30	9
2 - PALE	0	0	0
3 - DARKENED	0	0	0
4 - DARKENED, BROWN	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0
SKIN - COLOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - PINK	10	30	9
2 - PALE	0	0	0
3 - DARKENED	0	0	0
4 - DARKENED, BROWN	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0
EYE PROMINENCE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL	10	30	9
2 - EXOPHTHALMUS	0	0	0
3 - ENOPHTHALMUS	0	0	0
MUSCLE TONE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	10	30	8
2 - MUSCLE IS SOFT AND FLABBY	0	0	1
3 - MUSCLE IS TENSE AND HARD	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
MOBILITY			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL	9	30	9
2 - SLIGHTLY IMPAIRED	1	0	0
3 - MODERATELY IMPAIRED	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0
GAIT			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL	9	30	9
2 - WALKS ON TIPTOES	0	0	0
3 - BODY DRAGS	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	1	0	0
6 - ATAXIA	0	0	0
7 - WALKS ON METATARSUS	0	0	0
CONVULSIONS - CLONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - ABSENT	10	30	9
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0
4 - WHOLE BODY TREMORS	0	0	0
5 - CLONIC CONVULSIONS	0	0	0
6 - WET DOG SHAKES	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
CONVULSIONS - TONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - ABSENT	10	30	9
2 - TONIC	0	0	0
3 - OPISTHOTONUS	0	0	0
4 - EMPROSTHOTONUS	0	0	0
5 - ASPHYXIAL	0	0	0
TREMORS			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NONE	10	30	9
2 - SLIGHT (1.5 MM)	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0
GAIT SCORE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL	9	30	9
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	1	0	0
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	0	0	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
AROUSAL			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - VERY LOW	0	0	0
2 - LOW	1	0	0
3 - NORMAL	9	30	9
4 - SOMEWHAT HIGH	0	0	0
5 - VERY HIGH	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NONE	10	30	9
2 - HEAD FLICK	0	0	0
3 - HEAD SEARCH	0	0	0
4 - HALLUCINATORY	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0
6 - PRANCING	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0
8 - AIMLESS WANDERING	0	0	0
9 - CIRCLING	0	0	0
10 - WALTZING	0	0	0
11 - RETROPULSION	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0
15 - VERTICAL JUMPING	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0
17 - HEAD BOBBING	0	0	0
18 - WRITHING	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
TIME TO FIRST STEP (seconds)			
GRAND MEAN	0.4	0.5	1.0
SD	0.06	0.10	0.00
MIN	0.3	0.4	1.0
MAX	0.4	0.6	1.0
REARING			
GRAND MEAN	3.7	4.8	4.1
SD	0.71	1.90	0.00
MIN	3.2	3.4	4.1
MAX	4.2	6.1	4.1
BACKING			
GRAND MEAN	0.0	0.0	0.0
SD	0.00	0.00	0.00
MIN	0.0	0.0	0.0
MAX	0.0	0	0.0
GROOMING			
GRAND MEAN	0.0	0.1	0.0
SD	0.00	0.00	0.00
MIN	0.0	0.0	0.0
MAX	0.0	0.1	0.0
URINATION			
GRAND MEAN	0.8	1.0	0.6
SD	0.28	0.30	0.00
MIN	0.6	0.8	0.6
MAX	1.0	1.2	0.6

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
DEFECATION			
GRAND MEAN	1.0	1.3	1.8
SD	0.00	0.70	0.00
MIN	1.0	0.8	1.8
MAX	1.0	1.8	1.8

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
SENSORY OBSERVATIONS			
APPROACH RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO REACTION	0	0	7
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	10	30	1
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	1
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0
TOUCH RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO REACTION	0	0	2
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	10	30	7
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0
STARTLE RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO REACTION	0	0	0
2 - SLIGHT REACTION	10	30	9
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
SENSORY OBSERVATIONS			
TAIL PINCH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO REACTION	0	0	3
2 - ANIMAL MAY TURN OR WALK AWAY	9	26	6
3 - MORE ENERGETIC RESPONSE THAN (2)	1	4	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0
OLFACTORY ORIENTATION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO REACTION PRESENT	0	0	0
2 - REACTION PRESENT	10	30	9
PUPIL RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO PUPIL RESPONSE	0	0	0
2 - PUPIL RESPONSE PRESENT	10	30	9
EYEBLINK RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO EYEBLINK RESPONSE	0	0	0
2 - EYEBLINK RESPONSE PRESENT	10	30	9
FORELIMB EXTENSION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO FORELIMB EXTENSION	0	0	0
2 - FORELIMB EXTENSION PRESENT	10	30	9

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
SENSORY OBSERVATIONS			
HINDLIMB EXTENSION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NO HINDLIMB EXTENSION	0	0	0
2 - HINDLIMB EXTENSION PRESENT	10	30	9
AIR RIGHTING REFLEX			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - NORMAL	10	29	7
2 - SLIGHTLY UNCOORDINATED	0	1	2
3 - LANDS ON SIDE	0	0	0
4 - LANDS ON BACK	0	0	0
NEUROMUSCULAR OBSERVATIONS			
HINDLIMB EXTENSOR STRENGTH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
1 - HINDLIMB RESISTANCE ABSENT	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	0
3 - HINDLIMB RESISTANCE PRESENT	10	30	9

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
NEUROMUSCULAR OBSERVATIONS			
GRIPSTRENGTH - HINDLIMB (g)			
GRAND MEAN	470.1	627.9	529.7
SD	49.36	155.00	0.00
MIN	435.2	518.2	529.7
MAX	505.0	737.5	529.7
GRIPSTRENGTH - FORELIMB (g)			
GRAND MEAN	836.7	1028.0	1104.2
SD	313.53	109.80	0.00
MIN	615.0	950.4	1104.2
MAX	1058.4	1105.7	1104.2
ROTAROD PERFORMANCE (seconds)			
GRAND MEAN	51.8	10.1	1.4
SD	0.41	6.60	0.00
MIN	51.5	5.4	1.4
MAX	52.1	14.8	1.4
HINDLIMB FOOTSPLAY (mm)			
GRAND MEAN	80.1	66.4	59.2
SD	4.38	15.50	0.00
MIN	77.0	55.4	59.2
MAX	83.2	77.3	59.2

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Males

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	9
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
PHYSIOLOGICAL OBSERVATIONS			
CATALEPSY (seconds)			
GRAND MEAN	0.8	1.7	0.7
SD	0.79	0.80	0.00
MIN	0.2	1.2	0.7
MAX	1.4	2.3	0.7
BODY TEMPERATURE (ºC)			
GRAND MEAN	38.5	36.2	36.7
SD	0.33	1.10	0.00
MIN	38.3	35.5	36.7
MAX	38.7	37	36.7

Version 1.2
8/18/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HOME CAGE OBSERVATIONS			
POSTURE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	32	10
1 - SITTING OR STANDING NORMALLY	3	21	9
2 - ASLEEP, LYING ON SIDE OR CURLED UP	0	1	0
3 - ALERT, ORIENTED TOWARD OBSERVER	6	8	1
4 - SITTING, HEAD HELD LOW	0	0	0
5 - FLATTENED, LIMBS MAY BE EXTENDED	0	0	0
6 - LYING ON SIDE, LIMBS IN AIR	0	0	0
7 - IMMOBILE	0	0	0
8 - REARING	1	2	0
9 - SPLAYED HINDLIMBS	0	0	0
CONVULSIONS - CLONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - ABSENT	10	30	10
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0
4 - WHOLE BODY TREMORS	0	0	0
5 - CLONIC CONVULSIONS	0	0	0
6 - WET DOG SHAKES	0	0	0
CONVULSIONS - TONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - ABSENT	10	30	10
2 - TONIC	0	0	0
3 - OPISTHOTONUS	0	0	0
4 - EMPROSTHOTONUS	0	0	0
5 - ASPHYXIAL	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HOME CAGE OBSERVATIONS			
TREMORS			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NONE	10	30	10
2 - SLIGHT (1.5 MM)	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0
BITING			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NONE	9	29	10
2 - BITING OF CAGE	0	1	0
3 - BITING OF SELF	1	0	0
PALPEBRAL CLOSURE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - EYELIDS WIDE OPEN	10	28	10
2 - EYELIDS SLIGHTLY DROOPING	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	1	0
4 - EYELIDS COMPLETELY SHUT	0	1	0
FECES CONSISTENCY			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PELLETS	5	22	3
2 - PELLETS, PARTIALLY FORMED	0	0	0
3 - UNFORMED, DIARRHEA	0	0	0
4 - PELLETS ABSENT	5	8	7

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
EASE OF REMOVAL FROM CAGE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - VERY EASY	9	30	10
2 - EASY	0	0	0
3 - MODERATELY DIFFICULT	0	0	0
4 - FREEZES	0	0	0
5 - DIFFICULT	1	0	0
6 - VERY DIFFICULT	0	0	0
EASE OF HANDLING ANIMAL IN HAND			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - LOW	10	30	8
2 - MODERATELY LOW	0	0	2
3 - MODERATELY HIGH	0	0	0
4 - HIGH	0	0	0
LACRIMATION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NONE	10	30	10
2 - SLIGHT	0	0	0
3 - SEVERE	0	0	0
CHROMODACRYORRHEA			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - ABSENT	10	30	10
2 - PRESENT	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
SALIVATION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NONE	10	30	10
2 - SLIGHT	0	0	0
3 - SEVERE	0	0	0
PILOERECTION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NONE	10	30	10
2 - SLIGHT	0	0	0
3 - SEVERE	0	0	0
FUR APPEARANCE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL: CLEAN AND GROOMED	10	30	9
2 - SLIGHTLY SOILED	0	0	1
3 - VERY SOILED, CRUSTY	0	0	0
PALPEBRAL CLOSURE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - EYELIDS WIDE OPEN	10	30	10
2 - EYELIDS SLIGHTLY DROOPING	0	0	0
3 - DROOPING EYELIDS (HALF CLOSED)	0	0	0
4 - EYELIDS COMPLETELY SHUT	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
RESPIRATORY RATE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL: BY OBSERVATION (80-110/MIN.)	10	30	10
2 - DECREASED: (BELOW 80/MIN.)	0	0	0
3 - INCREASED: (ABOVE 110/MIN.)	0	0	0
RESPIRATORY CHARACTER			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL	10	30	10
2 - RALES	0	0	0
3 - RETCHING	0	0	0
4 - DYSPNEIC	0	0	0
5 - GASPING	0	0	0
RED DEPOSITS - EYES			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PRESENT	1	1	0
2 - ABSENT	9	29	10
RED DEPOSITS - NOSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PRESENT	0	2	0
2 - ABSENT	10	28	10
RED DEPOSITS - MOUTH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PRESENT	0	0	0
2 - ABSENT	10	30	10

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
CRUSTY DEPOSITS - EYES			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PRESENT	0	1	0
2 - ABSENT	10	29	10
CRUSTY DEPOSITS - NOSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PRESENT	0	0	2
2 - ABSENT	10	30	8
CRUSTY DEPOSITS - MOUTH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PRESENT	0	0	0
2 - ABSENT	10	30	10
MUCOUS MEMBRANES - COLOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PINK	10	30	10
2 - PALE	0	0	0
3 - DARKENED	0	0	0
4 - DARKENED, BROWN	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
HANDLING OBSERVATIONS			
EYES - COLOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PINK	10	30	10
2 - PALE	0	0	0
3 - DARKENED	0	0	0
4 - DARKENED, BROWN	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0
SKIN - COLOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - PINK	10	30	10
2 - PALE	0	0	0
3 - DARKENED	0	0	0
4 - DARKENED, BROWN	0	0	0
5 - BRIGHT, DEEP RED FLUSH	0	0	0
EYE PROMINENCE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL	9	30	10
2 - EXOPHTHALMUS	1	0	0
3 - ENOPHTHALMUS	0	0	0
MUSCLE TONE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - MUSCLE IS FIRM BUT NOT HARD (NORMAL)	10	30	9
2 - MUSCLE IS SOFT AND FLABBY	0	0	1
3 - MUSCLE IS TENSE AND HARD	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
MOBILITY			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL	10	30	10
2 - SLIGHTLY IMPAIRED	0	0	0
3 - MODERATELY IMPAIRED	0	0	0
4 - TOTALLY IMPAIRED, LOCOMOTION IMPOSSIBLE	0	0	0
GAIT			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL	10	30	10
2 - WALKS ON TIPTOES	0	0	0
3 - BODY DRAGS	0	0	0
4 - HINDLIMBS SPLAYED OR DRAGGING	0	0	0
5 - HUNCHED BODY, BOTTOM UP, NOSE HELD DOWN,	0	0	0
6 - ATAXIA	0	0	0
7 - WALKS ON METATARSUS	0	0	0
CONVULSIONS - CLONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - ABSENT	10	30	10
2 - REPETITIVE MOVEMENT OF MOUTH AND JAWS	0	0	0
3 - CLONIC TREMORS OF THE LIMBS	0	0	0
4 - WHOLE BODY TREMORS	0	0	0
5 - CLONIC CONVULSIONS	0	0	0
6 - WET DOG SHAKES	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
CONVULSIONS - TONIC			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - ABSENT	10	30	10
2 - TONIC	0	0	0
3 - OPISTHOTONUS	0	0	0
4 - EMPROSTHOTONUS	0	0	0
5 - ASPHYXIAL	0	0	0
TREMORS			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NONE	10	30	10
2 - SLIGHT (1.5 MM)	0	0	0
3 - MODERATELY COARSE (3 MM)	0	0	0
4 - MARKEDLY COARSE (4.5 MM)	0	0	0
5 - EXTREMELY COARSE (6 MM)	0	0	0
GAIT SCORE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL	10	30	10
2 - SLIGHT IMPAIRMENT, BUT DEFINITE	0	0	0
3 - CONSIDERABLE IMPAIRMENT, WITHOUT FALLING	0	0	0
4 - MARKED IMPAIRMENT, FALLS EVERY 4 TO 6 STEPS	0	0	0
5 - SEVERE IMPAIRMENT, CANNOT WALK WITHOUT F	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
AROUSAL			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - VERY LOW	0	0	0
2 - LOW	0	0	0
3 - NORMAL	9	30	10
4 - SOMEWHAT HIGH	1	0	0
5 - VERY HIGH	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NONE	10	30	10
2 - HEAD FLICK	0	0	0
3 - HEAD SEARCH	0	0	0
4 - HALLUCINATORY	0	0	0
5 - COMPULSIVE LICKING OR BITING	0	0	0
6 - PRANCING	0	0	0
7 - UPRIGHT WALKING: ON HINDLIMBS ONLY	0	0	0
8 - AIMLESS WANDERING	0	0	0
9 - CIRCLING	0	0	0
10 - WALTZING	0	0	0
11 - RETROPULSION	0	0	0
12 - SPATIAL DISORIENTATION	0	0	0
13 - SIDE TO SIDE ROCKING	0	0	0
14 - STRAUB TAIL: INCREASED TAIL ELEVATION	0	0	0
15 - VERTICAL JUMPING	0	0	0
16 - PACING WITHOUT PURPOSE	0	0	0
17 - HEAD BOBBING	0	0	0
18 - WRITHING	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
TIME TO FIRST STEP (seconds)			
GRAND MEAN	0.3	0.4	0.8
SD	0.01	0.00	0.00
MIN	0.3	0.4	0.8
MAX	0.3	0.4	0.8
REARING			
GRAND MEAN	10.1	8.3	10.1
SD	5.80	0.30	0.00
MIN	6.0	8.1	10.1
MAX	14.2	8.6	10.1
BACKING			
GRAND MEAN	0.0	0.0	0.0
SD	0.00	0.00	0.00
MIN	0.0	0.0	0.0
MAX	0.0	0	0.0
GROOMING			
GRAND MEAN	0.4	0.2	0.2
SD	0.00	0.00	0.00
MIN	0.4	0.2	0.2
MAX	0.4	0.2	0.2
URINATION			
GRAND MEAN	0.1	1.0	0.5
SD	0.14	0.20	0.00
MIN	0.0	0.9	0.5
MAX	0.2	1.2	0.5

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
OPEN FIELD OBSERVATIONS			
DEFECATION			
GRAND MEAN	0.0	0.3	0.1
SD	0.00	0.00	0.00
MIN	0.0	0.3	0.1
MAX	0.0	0.3	0.1

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
SENSORY OBSERVATIONS			
APPROACH RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO REACTION	0	0	6
2 - SLOW APPROACH, SNIFFING OR TURNING AWAY	10	30	4
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0
TOUCH RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO REACTION	0	0	3
2 - ANIMAL MAY SLOWLY TURN, WALK AWAY	10	30	7
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTION: JUMPS, BITES OR ATTACKS	0	0	0
STARTLE RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO REACTION	0	0	0
2 - SLIGHT REACTION	10	30	10
3 - MORE ENERGETIC RESPONSE THAN (2)	0	0	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTIONS: JUMPS, ATTACKS, BITES	0	0	0

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
SENSORY OBSERVATIONS			
TAIL PINCH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO REACTION	0	0	0
2 - ANIMAL MAY TURN OR WALK AWAY	8	27	10
3 - MORE ENERGETIC RESPONSE THAN (2)	2	3	0
4 - FREEZES, ACTUAL MUSCLE CONTRACTION	0	0	0
5 - BIZARRE REACTION: JUMPS, ATTACKS OR BITES	0	0	0
OLFACTORY ORIENTATION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO REACTION PRESENT	0	0	0
2 - REACTION PRESENT	10	30	10
PUPIL RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO PUPIL RESPONSE	0	0	0
2 - PUPIL RESPONSE PRESENT	10	30	10
EYEBLINK RESPONSE			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO EYEBLINK RESPONSE	0	0	0
2 - EYEBLINK RESPONSE PRESENT	10	30	10
FORELIMB EXTENSION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO FORELIMB EXTENSION	0	0	0
2 - FORELIMB EXTENSION PRESENT	10	30	10

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
SENSORY OBSERVATIONS			
HINDLIMB EXTENSION			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NO HINDLIMB EXTENSION	0	0	0
2 - HINDLIMB EXTENSION PRESENT	10	30	10
AIR RIGHTING REFLEX			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - NORMAL	10	30	10
2 - SLIGHTLY UNCOORDINATED	0	0	0
3 - LANDS ON SIDE	0	0	0
4 - LANDS ON BACK	0	0	0
NEUROMUSCULAR OBSERVATIONS			
HINDLIMB EXTENSOR STRENGTH			
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
1 - HINDLIMB RESISTANCE ABSENT	0	0	0
2 - REDUCED HINDLIMB RESISTANCE	0	0	0
3 - HINDLIMB RESISTANCE PRESENT	10	30	10

Version 1.2
9/4/2009

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
NEUROMUSCULAR OBSERVATIONS			
GRIPSTRENGTH - HINDLIMB (g)			
GRAND MEAN	406.7	522.0	396.8
SD	51.90	155.30	0.00
MIN	370.0	412.2	396.8
MAX	443.4	631.8	396.8
GRIPSTRENGTH - FORELIMB (g)			
GRAND MEAN	627.5	900.9	898.6
SD	76.51	132.90	0.00
MIN	573.4	807.0	898.6
MAX	681.6	994.9	898.6
ROTAROD PERFORMANCE (seconds)			
GRAND MEAN	104.3	42.8	20.9
SD	0.48	32.60	0.00
MIN	104.0	19.8	20.9
MAX	104.6	65.8	20.9
HINDLIMB FOOTSPLAY (mm)			
GRAND MEAN	59.1	50.8	45.6
SD	19.09	14.50	0.00
MIN	45.6	40.6	45.6
MAX	72.6	61.1	45.6

Subchronic - Functional Observation Battery
WIL Research Laboratories - Historical Control Data
Females

TIME POINT (STUDY WEEK)	16	25	30
NUMBER OF STUDIES	2	2	1
NUMBER OF ANIMALS TESTED	10	30	10
AGE RANGE OF ANIMALS TESTED	23 - 23	31 - 32	37 - 37
PHYSIOLOGICAL OBSERVATIONS			
CATALEPSY (seconds)			
GRAND MEAN	0.4	0.5	0.4
SD	0.17	0.20	0.00
MIN	0.2	0.4	0.4
MAX	0.5	0.7	0.4
BODY TEMPERATURE (ºC)			
GRAND MEAN	38.9	37.4	37.8
SD	0.73	0.50	0.00
MIN	38.4	37.0	37.8
MAX	39.5	37.7	37.8

Version 1.2
8/18/2009

APPENDIX N

WIL Subchronic Motor Activity Historical Control Data
Version 1.5 [Crl:CD(SD) Rats]

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		PRETEST													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1255	714	562	282	284	317	3415	410	150	97	41	24	25	747
13	AM	1275	827	469	230	148	61	3010	315	158	79	27	21	1	602
15	PM	1308	605	373	173	150	68	2677	405	101	77	23	18	10	634
29	PM	1212	649	397	170	82	73	2581	365	111	79	9	2	1	567
30	PM	1128	437	167	79	92	140	2043	366	108	11	9	3	6	504
33	PM	1215	621	253	129	145	192	2555	402	126	28	17	2	3	579
36	PM	1296	705	569	290	205	172	3235	389	123	100	38	16	5	670
39	PM	1239	700	357	122	75	134	2627	424	135	58	17	3	1	638
40	PM	1346	731	333	134	109	127	2780	399	145	46	14	1	15	620
42	AM	1353	715	351	225	127	106	2876	402	163	38	35	10	1	649
43	AM	1330	841	545	309	132	81	3237	425	193	121	72	17	1	829
44	PM	1169	634	322	152	177	180	2634	353	134	32	9	13	13	553
53	NA	1896	745	384	292	170	173	3659	612	199	77	63	41	50	1042

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

Mean	1309	686	391	199	146	140	2871	405	142	65	29	13	10	664
StDev	188.9	103.4	119.3	76.8	56.4	69.9	431.5	69.6	30.5	32.3	20.5	11.5	14.0	141.3
SEM	52.4	28.7	33.1	21.3	15.6	19.4	119.7	19.3	8.5	9.0	5.7	3.2	3.9	39.2
Count	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Min	1128	437	167	79	75	61	2043	315	101	11	9	1	1	504
Max	1896	841	569	309	284	317	3659	612	199	121	72	41	50	1042
25th Quartile	1215	634	333	134	109	81	2627	366	123	38	14	3	1	579
75th Quartile	1330	731	469	282	170	173	3235	410	158	79	38	18	13	670

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 1													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1283	742	569	514	232	185	3524	377	150	113	102	29	32	802
33	PM	1257	705	324	64	46	120	2515	356	136	43	3	3	10	551
37	AM	1291	634	580	292	133	123	3053	361	146	111	72	20	23	732
44	PM	1313	920	616	327	107	61	3345	391	209	117	64	8	4	793
53	NA	1199	890	634	620	308	295	3947	353	213	132	152	71	76	997
Mean		1269	778	545	364	165	157	3277	367	171	103	79	26	29	775
StDev		43.7	122.7	126.1	214.7	104.1	88.9	534.9	15.9	37.0	34.4	54.4	27.1	28.3	159.7
SEM		19.5	54.9	56.4	96.0	46.5	39.8	239.2	7.1	16.5	15.4	24.3	12.1	12.7	71.4
Count		5	5	5	5	5	5	5	5	5	5	5	5	5	5
Min		1199	634	324	64	46	61	2515	353	136	43	3	3	4	551
Max		1313	920	634	620	308	295	3947	391	213	132	152	71	76	997
25th Quartile		1257	705	569	292	107	120	3053	356	146	111	64	8	10	732
75th Quartile		1291	890	616	514	232	185	3524	377	209	117	102	29	32	802

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
	WEEK 2													
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
37 AM	1231	725	416	522	148	136	3178	324	129	72	112	20	21	677
Mean	1231	725	416	522	148	136	3178	324	129	72	112	20	21	677
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 3													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1148	696	567	423	266	140	3240	259	116	91	63	44	24	598
15	PM	1308	749	471	315	240	127	3210	285	148	85	51	39	20	627
23	AM	1624	1042	880	640	321	210	4718	402	228	181	124	40	38	1012
30	PM	1090	702	308	209	16	169	2495	239	128	50	37	0	35	489
31	AM	1413	926	594	394	336	172	3834	353	164	105	67	65	23	776
33	PM	1275	780	446	186	72	23	2783	332	145	73	22	11	0	583
35	AM	1220	814	636	332	280	136	3417	257	136	95	53	40	19	600
36	PM	1215	759	456	237	113	203	2983	273	124	65	35	13	35	545
39	PM	1254	681	341	151	115	247	2789	331	135	57	22	14	50	607
43	AM	1304	694	441	438	334	125	3335	309	129	84	94	54	16	685
44	PM	1442	829	522	313	140	87	3331	372	149	76	47	21	11	675
49	AM	1370	1036	908	486	255	124	4178	325	226	200	106	46	41	944
53	NA	1195	671	535	575	325	196	3497	312	132	101	120	75	34	773
57	NA	1223	680	395	352	192	80	2921	267	118	54	50	33	8	528
58	NA	1245	831	559	407	340	246	3628	319	174	102	85	68	49	797

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

Mean	1288	793	537	364	223	152	3357	309	150	94	65	37	27	683
StDev	132.0	123.3	171.0	139.0	107.6	62.7	573.8	46.0	35.1	42.9	33.4	22.5	14.9	151.2
SEM	34.1	31.8	44.1	35.9	27.8	16.2	148.2	11.9	9.1	11.1	8.6	5.8	3.9	39.0
Count	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Min	1090	671	308	151	16	23	2495	239	116	50	22	0	0	489
Max	1624	1042	908	640	340	247	4718	402	228	200	124	75	50	1012
25th Quartile	1217	695	443	275	127	124	2952	270	129	69	42	18	17	590
75th Quartile	1339	830	581	430	323	199	3562	332	157	101	89	50	37	774

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 4													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
7	AM	1298	911	716	662	630	353	4570	271	171	109	126	87	50	814
13	AM	1326	769	470	345	349	341	3600	294	152	86	55	59	56	702
Mean		1312	840	593	503	490	347	4085	282	162	98	91	73	53	758
StDev		19.8	100.3	174.0	224.3	199.0	8.1	685.9	16.4	13.4	15.8	50.7	20.1	4.3	79.3
SEM		14.0	71.0	123.1	158.6	140.7	5.7	485.0	11.6	9.5	11.2	35.9	14.2	3.1	56.1
Count		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Min		1298	769	470	345	349	341	3600	271	152	86	55	59	50	702
Max		1326	911	716	662	630	353	4570	294	171	109	126	87	56	814
25th Quartile		1305	804	532	424	419	344	3843	277	157	92	73	66	51	730
75th Quartile		1319	875	655	583	560	350	4328	288	166	103	108	80	54	786

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 5													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
57	NA	1270	737	570	357	341	119	3394	285	123	82	63	60	10	623
58	NA	1210	818	457	473	200	119	3277	291	169	84	96	19	16	676
Mean		1240	778	513	415	271	119	3336	288	146	83	80	40	13	650
StDev		42.3	57.1	79.8	81.9	100.0	0.6	82.4	4.2	32.4	1.8	23.3	28.7	4.7	37.8
SEM		29.9	40.4	56.4	57.9	70.7	0.4	58.3	3.0	22.9	1.3	16.5	20.3	3.3	26.7
Count		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Min		1210	737	457	357	200	119	3277	285	123	82	63	19	10	623
Max		1270	818	570	473	341	119	3394	291	169	84	96	60	16	676
25th Quartile		1225	757	485	386	235	119	3306	287	135	82	72	29	11	636
75th Quartile		1255	798	542	444	306	119	3365	290	158	84	88	50	15	663

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 7													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1178	623	495	314	167	212	2989	226	99	79	43	19	29	495
33	PM	1227	710	357	252	74	114	2734	305	118	50	52	7	13	545
44	PM	1386	827	522	265	247	204	3450	307	156	94	40	38	22	658
53	NA	1111	599	440	388	342	200	3080	245	111	82	73	48	36	595
Mean		1225	690	453	305	208	182	3063	271	121	76	52	28	25	573
StDev		117.0	103.0	73.0	61.6	114.1	46.0	296.4	41.7	24.8	18.6	15.2	18.5	9.9	69.7
SEM		58.5	51.5	36.5	30.8	57.1	23.0	148.2	20.8	12.4	9.3	7.6	9.3	4.9	34.8
Count		4	4	4	4	4	4	4	4	4	4	4	4	4	4
Min		1111	599	357	252	74	114	2734	226	99	50	40	7	13	495
Max		1386	827	522	388	342	212	3450	307	156	94	73	48	36	658
25th Quartile		1161	617	419	262	144	179	2925	240	108	72	42	16	20	532
75th Quartile		1267	739	502	332	271	206	3172	306	127	85	57	40	31	611

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
	WEEK 10													
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
8 AM	1408	1110	796	533	327	284	4459	295	206	144	77	43	39	803
Mean	1408	1110	796	533	327	284	4459	295	206	144	77	43	39	803
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
	WEEK 11													
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
8 AM	1300	605	265	83	34	169	2456	256	59	27	7	2	31	382
Mean	1300	605	265	83	34	169	2456	256	59	27	7	2	31	382
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 12													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1102	627	436	374	299	262	3101	193	83	57	52	37	31	452
24	AM	1116	702	492	336	251	83	2979	186	92	80	33	34	2	426
29	PM	1327	833	559	513	424	229	3885	267	128	79	90	56	37	657
33	PM	1116	603	291	101	117	130	2357	242	91	37	9	11	16	407
34	AM	1150	675	573	477	345	279	3498	212	102	85	64	53	42	559
42	AM	1244	653	487	300	219	162	3065	225	94	64	34	23	25	465
44	PM	1518	716	493	309	268	225	3529	322	106	66	44	41	29	608
53	NA	1181	609	395	281	220	231	2917	229	97	59	43	32	25	484
Mean		1219	677	466	336	268	200	3166	235	99	66	46	36	26	507
StDev		142.9	75.0	91.5	127.0	91.8	68.2	466.7	43.8	13.5	15.5	23.9	14.9	12.3	90.3
SEM		50.5	26.5	32.4	44.9	32.5	24.1	165.0	15.5	4.8	5.5	8.5	5.3	4.3	31.9
Count		8	8	8	8	8	8	8	8	8	8	8	8	8	8
Min		1102	603	291	101	117	83	2357	186	83	37	9	11	2	407
Max		1518	833	573	513	424	279	3885	322	128	85	90	56	42	657
25th Quartile		1116	623	426	295	220	154	2964	207	92	59	34	29	23	446
75th Quartile		1265	705	510	400	310	239	3506	248	103	79	55	44	32	572

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 25													
Minutes		**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number	Time														
11	PM	899	704	384	195	163	166	2511	134	76	29	9	9	11	267
40	PM	1092	557	343	251	198	132	2573	178	67	35	33	19	12	345
Mean		996	630	364	223	181	149	2542	156	71	32	21	14	12	306
StDev		136.0	103.6	28.7	39.4	24.9	23.8	44.2	31.3	6.8	4.7	17.1	7.6	0.7	54.6
SEM		96.2	73.3	20.3	27.8	17.6	16.8	31.2	22.1	4.8	3.3	12.1	5.4	0.5	38.6
Count		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Min		899	557	343	195	163	132	2511	134	67	29	9	9	11	267
Max		1092	704	384	251	198	166	2573	178	76	35	33	19	12	345
25th Quartile		948	594	353	209	172	141	2526	145	69	30	15	11	12	287
75th Quartile		1044	667	374	237	189	157	2558	167	74	34	27	17	12	325

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: M | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
	WEEK 31													
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
11 PM	824	438	253	132	147	107	1900	128	34	15	5	11	4	199
Mean	824	438	253	132	147	107	1900	128	34	15	5	11	4	199
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

Version 1.5
03-May-10

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		PRETEST													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1240	576	405	276	219	412	3127	415	134	94	43	35	109	831
13	AM	1619	743	357	203	186	313	3421	494	167	86	44	32	76	898
15	PM	1317	763	359	131	87	133	2790	483	199	56	15	2	1	756
29	PM	1430	738	216	153	39	82	2657	457	171	31	30	0	1	689
30	PM	1124	524	170	153	248	324	2544	353	105	5	0	5	13	481
33	PM	1349	525	241	150	245	285	2794	497	130	43	2	34	55	761
36	PM	1455	772	495	310	333	330	3695	479	210	107	25	61	67	948
39	PM	1366	685	280	106	209	154	2800	503	184	69	25	28	2	811
40	PM	1291	528	170	287	161	183	2621	426	93	26	71	28	37	680
42	AM	1533	793	518	539	410	191	3984	536	226	127	157	109	36	1191
43	AM	1530	732	554	596	364	413	4187	520	190	155	176	97	104	1243
44	PM	1188	418	129	278	271	175	2458	420	87	5	16	20	4	553
53	NA	1912	511	434	326	121	147	3450	659	114	137	81	27	32	1051

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

Mean	1412	639	333	270	222	242	3118	480	155	72	53	37	41	838
StDev	207.5	127.9	143.0	151.7	107.5	109.6	575.0	73.8	46.6	50.1	55.9	33.7	38.4	227.1
SEM	57.5	35.5	39.7	42.1	29.8	30.4	159.5	20.5	12.9	13.9	15.5	9.3	10.7	63.0
Count	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Min	1124	418	129	106	39	82	2458	353	87	5	0	0	1	481
Max	1912	793	554	596	410	413	4187	659	226	155	176	109	109	1243
25th Quartile	1291	525	216	153	161	154	2657	426	114	31	16	20	4	689
75th Quartile	1530	743	434	310	271	324	3450	503	190	107	71	35	67	948

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 1													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1366	673	364	508	498	271	3680	435	177	69	119	108	70	978
33	PM	1462	753	196	203	191	52	2856	511	195	32	32	32	0	802
37	AM	1512	842	517	266	275	400	3810	510	207	145	55	73	97	1088
44	PM	1548	781	462	359	161	100	3410	539	204	111	102	35	20	1010
53	NA	1454	818	701	422	267	465	4126	455	206	186	113	59	122	1141
Mean		1468	773	448	351	278	258	3576	490	198	108	84	61	62	1004
StDev		69.0	65.7	186.7	121.5	132.0	180.4	477.9	43.3	12.7	60.9	38.4	31.3	51.1	129.7
SEM		30.9	29.4	83.5	54.3	59.0	80.7	213.7	19.3	5.7	27.2	17.2	14.0	22.8	58.0
Count		5	5	5	5	5	5	5	5	5	5	5	5	5	5
Min		1366	673	196	203	161	52	2856	435	177	32	32	32	0	802
Max		1548	842	701	508	498	465	4126	539	207	186	119	108	122	1141
25th Quartile		1454	753	364	266	191	100	3410	455	195	69	55	35	20	978
75th Quartile		1512	818	517	422	275	400	3810	511	206	145	113	73	97	1088

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
WEEK 2														
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
37 AM	1417	541	202	237	291	376	3064	452	124	37	59	65	98	834
Mean	1417	541	202	237	291	376	3064	452	124	37	59	65	98	834
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 3													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1225	591	342	317	307	425	3207	361	128	67	76	61	92	784
15	PM	1470	826	514	306	267	478	3862	467	220	131	71	55	106	1050
23	AM	1578	924	623	452	426	397	4400	453	201	134	111	63	77	1038
30	PM	1551	1003	560	277	240	287	3919	450	271	109	46	53	83	1013
31	AM	1452	836	549	550	341	248	3977	417	174	124	111	60	46	931
33	PM	1639	813	494	358	364	283	3952	553	209	136	98	110	77	1182
35	AM	1536	994	465	449	509	394	4346	476	267	98	120	100	70	1131
36	PM	1498	862	566	374	268	252	3819	443	213	137	80	67	49	989
39	PM	1630	858	520	369	352	234	3963	514	231	134	86	97	50	1112
43	AM	1347	585	438	388	366	362	3486	399	142	114	102	87	95	938
44	PM	1619	683	493	481	251	197	3724	555	168	123	121	53	48	1068
49	AM	1550	953	493	218	347	360	3919	440	227	98	54	84	84	987
53	NA	1356	711	489	396	609	240	3800	383	178	106	109	167	41	984
57	NA	1508	864	547	317	299	569	4105	422	188	121	51	53	124	959
58	NA	1499	882	581	407	468	355	4191	486	235	142	92	138	81	1174

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

Mean	1497	826	512	377	361	339	3911	455	203	118	88	83	75	1023
StDev	115.2	130.7	67.2	85.0	103.7	103.6	303.3	56.6	41.2	20.1	24.9	34.3	24.3	103.9
SEM	29.8	33.7	17.4	21.9	26.8	26.8	78.3	14.6	10.6	5.2	6.4	8.8	6.3	26.8
Count	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Min	1225	585	342	218	240	197	3207	361	128	67	46	53	41	784
Max	1639	1003	623	550	609	569	4400	555	271	142	121	167	124	1182
25th Quartile	1461	762	491	317	283	250	3810	419	176	107	73	58	50	972
75th Quartile	1565	903	555	428	396	396	4041	481	229	134	110	99	88	1090

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 4													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
7	AM	970	243	343	419	413	259	2645	188	31	56	81	63	79	500
13	AM	1586	741	287	374	217	322	3526	455	157	45	85	39	64	844
Mean		1278	492	315	396	315	290	3086	321	94	51	83	51	72	672
StDev		435.2	352.1	39.4	31.9	138.0	44.8	622.9	188.4	88.5	7.6	2.2	17.0	11.1	243.4
SEM		307.7	249.0	27.9	22.6	97.6	31.7	440.4	133.2	62.6	5.4	1.6	12.0	7.8	172.1
Count		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Min		970	243	287	374	217	259	2645	188	31	45	81	39	64	500
Max		1586	741	343	419	413	322	3526	455	157	56	85	63	79	844
25th Quartile		1124	367	301	385	266	274	2866	255	63	48	82	45	68	586
75th Quartile		1432	616	329	407	364	306	3306	388	125	53	84	57	75	758

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 5													
Minutes		**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number	Time														
57	NA	1535	966	488	364	562	499	4414	392	249	125	67	151	124	1107
58	NA	1360	788	698	588	379	362	4176	491	228	178	179	94	89	1260
Mean		1448	877	593	476	471	431	4295	441	239	151	123	123	107	1183
StDev		123.6	125.6	148.6	158.5	129.5	96.7	168.3	70.4	14.7	37.6	78.9	39.9	24.2	108.2
SEM		87.4	88.8	105.1	112.1	91.6	68.4	119.0	49.8	10.4	26.6	55.8	28.2	17.1	76.5
Count		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Min		1360	788	488	364	379	362	4176	392	228	125	67	94	89	1107
Max		1535	966	698	588	562	499	4414	491	249	178	179	151	124	1260
25th Quartile		1404	833	541	420	425	396	4236	417	233	138	95	109	98	1145
75th Quartile		1492	921	646	532	516	465	4355	466	244	165	151	137	115	1222

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F Study Type: SUBCHRONIC Species: CRL:CD(SD) Strain: RAT Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 7													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1179	586	346	528	354	203	3196	326	100	68	112	58	37	700
33	PM	1544	757	426	320	316	155	3517	500	192	113	83	100	20	1008
44	PM	1416	735	372	328	214	135	3198	437	170	70	81	40	30	826
53	NA	1364	707	437	384	531	449	3871	375	170	97	84	122	107	954
Mean		1376	696	395	390	354	235	3446	410	158	87	90	80	49	872
StDev		151.2	76.3	43.3	96.3	132.5	145.1	321.6	75.2	40.1	21.9	14.8	37.9	39.7	137.8
SEM		75.6	38.2	21.7	48.2	66.3	72.6	160.8	37.6	20.0	10.9	7.4	18.9	19.9	68.9
Count		4	4	4	4	4	4	4	4	4	4	4	4	4	4
Min		1179	586	346	320	214	135	3196	326	100	68	81	40	20	700
Max		1544	757	437	528	531	449	3871	500	192	113	112	122	107	1008
25th Quartile		1318	677	366	326	290	150	3198	363	152	69	82	53	27	795
75th Quartile		1448	740	428	420	398	264	3606	453	175	101	91	106	55	968

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
	WEEK 10													
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
8 AM	1438	860	617	486	381	349	4131	357	197	131	91	84	71	931
Mean	1438	860	617	486	381	349	4131	357	197	131	91	84	71	931
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
	WEEK 11													
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
8 AM	1204	520	192	169	276	279	2640	308	83	22	34	66	54	568
Mean	1204	520	192	169	276	279	2640	308	83	22	34	66	54	568
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 12													
Minutes		0-10	11-20	21-30	31-40	41-50	51-60	Cumulative	0-10	11-20	21-30	31-40	41-50	51-60	Cumulative
HC Number	Time														
12	AM	1156	561	315	356	264	200	2852	310	107	67	72	52	42	651
24	AM	1632	924	675	531	367	289	4417	487	195	123	109	92	57	1063
29	PM	1419	816	568	620	384	346	4151	361	172	128	142	89	59	951
33	PM	1483	537	326	371	233	372	3321	424	116	80	93	51	89	854
34	AM	1420	854	639	458	402	516	4289	424	189	144	96	73	112	1039
42	AM	1388	766	421	476	268	429	3749	347	166	80	95	49	88	824
44	PM	1411	720	447	190	110	200	3080	432	160	98	34	16	43	783
53	NA	1289	544	327	275	446	379	3260	304	106	63	52	106	83	713
Mean		1400	715	465	410	309	341	3640	386	151	98	87	66	72	860
StDev		138.1	151.5	145.4	139.4	110.3	109.2	595.3	65.5	36.3	30.5	33.8	29.5	25.0	148.3
SEM		48.8	53.6	51.4	49.3	39.0	38.6	210.5	23.2	12.9	10.8	12.0	10.4	8.8	52.4
Count		8	8	8	8	8	8	8	8	8	8	8	8	8	8
Min		1156	537	315	190	110	200	2852	304	106	63	34	16	42	651
Max		1632	924	675	620	446	516	4417	487	195	144	142	106	112	1063
25th Quartile		1363	557	327	336	256	267	3215	338	114	77	67	51	53	766
75th Quartile		1435	825	586	489	388	391	4186	426	176	124	99	90	88	973

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

		TOTAL							AMBULATORY						
		WEEK 25													
Minutes		**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number	Time														
11	PM	1326	837	354	186	147	93	2942	366	173	51	28	27	8	655
40	PM	1056	482	211	263	128	144	2283	237	91	19	42	12	22	424
Mean		1191	659	282	224	137	118	2612	302	132	35	35	20	15	539
StDev		190.9	250.6	101.3	54.3	13.4	36.0	465.9	91.7	57.7	23.0	9.9	10.4	9.7	163.2
SEM		135.0	177.2	71.6	38.4	9.5	25.5	329.4	64.8	40.8	16.3	7.0	7.3	6.8	115.4
Count		2	2	2	2	2	2	2	2	2	2	2	2	2	2
Min		1056	482	211	186	128	93	2283	237	91	19	28	12	8	424
Max		1326	837	354	263	147	144	2942	366	173	51	42	27	22	655
25th Quartile		1124	571	246	205	132	105	2448	269	112	27	32	16	12	481
75th Quartile		1259	748	318	244	142	131	2777	334	153	43	39	23	18	597

NA = Not applicable

WIL Research Laboratories - Historical Control Summary of Locomotor Activity
Kinder Scientific

Sex: F | Study Type: SUBCHRONIC | Species: CRL:CD(SD) | Strain: RAT | Date Range: 6/26/2007 - 10/20/2009

	TOTAL							AMBULATORY						
	WEEK 31													
Minutes	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**	**0-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**Cumulative**
HC Number Time														
11 PM	1379	658	399	211	187	187	3021	383	121	54	36	33	25	651
Mean	1379	658	399	211	187	187	3021	383	121	54	36	33	25	651
StDev														
SEM														
Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
25th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75th Quartile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NA = Not applicable

Version 1.5
03-May-10

APPENDIX O

WIL Reproductive Historical Control Data Version 2.11
[Crl:CD(SD) Rats]

WIL Research Laboratories - Developmental and Reproductive Toxicology
Historical Control Summary of Reproductive Performance

Sex: Male/Female | Species: Rat | Number of Studies/Data Sets: 163 / 221
Study Type: All | Strain: Crl:CD(SD) | Range of Study Dates: 08/00 - 10/09

	Total	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
Number of Males in Control Group	3690						
Male Mating Index (%)		96.8	3.78	141	89.24 / 100.00	85.46 / 100.00	84.0 / 100.0
Male Fertility Index (%)		91.1	7.11	141	76.88 / 100.00	69.77 / 100.00	60.0 / 100.0
Male Copulation Index (%)		94.4	5.78	106	82.84 / 100.00	77.06 / 100.00	71.4 / 100.0
Number of Females in Control Group	4848						
Female Mating Index (%)		98.2	2.94	169	92.32 / 100.00	89.38 / 100.00	86.7 / 100.0
Female Fertility Index (%)		93.2	6.96	191	79.28 / 100.00	72.32 / 100.00	60.0 / 100.0
Female Conception Index (%)		95.0	5.71	135	83.58 / 100.00	77.87 / 100.00	65.2 / 100.0
Number of Females Selected to Deliver	3315						
Number that Delivered	3035						
Number that did not Deliver	275						
Number that Died Prior to Delivery	5						
Number with Total Litter Loss	16						
Number with Dystocia	3						

N = Count of study means from control groups

Version 2.11
02-Aug-10

WIL Research Laboratories - Developmental and Reproductive Toxicology

Historical Control Summary of Reproductive Performance

Sex: Female | Species: Rat | Number of Studies/Control Groups: 163 / 221

Study Type: All | Strain: Crl:CD(SD) | Range of Study Dates: 08/00 - 10/09

	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
Mean Estrous Cycle Length (days)	4.4	0.36	149	3.68 / 5.12	3.32 / 5.48	3.6 / 5.8
Mean Pre-Coital Interval (days)	2.9	0.52	186	1.86 / 3.94	1.34 / 4.46	1.8 / 4.8
Mean Gestation Length (days)	21.9	0.18	97	21.54 / 22.26	21.36 / 22.44	21.5 / 22.3
Mean Number of Pups Born	14.4	0.95	98	12.50 / 16.30	11.55 / 17.25	11.7 / 16.6
Mean Viable Litter Size (PND 0)	14.2	0.98	98	12.24 / 16.16	11.26 / 17.14	11.6 / 16.4
Mean % Males/ Litter	50.0	2.97	149	44.06 / 55.94	41.09 / 58.91	42.9 / 58.5
Mean % Females/ Litter	50.1	2.91	149	44.28 / 55.92	41.37 / 58.83	41.5 / 57.1
Mean No. of Former Implantation Sites at Weaning	15.2	0.91	91	13.38 / 17.02	12.47 / 17.93	13.0 / 17.2
Mean No. of Sites Unaccounted for at Weaning	0.8	0.25	87	0.30 / 1.30	0.05 / 1.55	0.4 / 1.4
Mean Viable Embryos/Dam (GD 15)	14.7	0.78	69	13.14 / 16.26	12.36 / 17.04	11.9 / 16.3
Mean Viable Embryos (%/Litter)	94.7	1.74	69	91.22 / 98.18	89.48 / 99.92	88.8 / 97.1
Mean Viable Fetuses/Dam (GD 20)	14.7	0.74	54	13.22 / 16.18	12.48 / 16.92	13.0 / 16.3
Mean Viable Fetuses (%/Litter)	95.0	1.65	39	91.70 / 98.30	90.05 / 99.95	88.8 / 98.5
Mean Post-Implantation Loss/Dam	0.8	0.23	123	0.34 / 1.26	0.11 / 1.49	0.2 / 1.8
Mean Post-Implantation Loss (%/Litter)	5.3	1.72	125	1.86 / 8.74	0.14 / 10.46	1.5 / 11.2
Mean No. of Corpora Lutea/Dam	16.6	0.83	123	14.94 / 18.26	14.11 / 19.09	13.8 / 18.8
Mean No. of Implantation Sites/Dam	15.5	0.76	124	13.98 / 17.02	13.22 / 17.78	12.6 / 17.1
Mean Pre-Implantation Loss/Dam	1.2	0.45	123	0.30 / 2.10	0.00 / 2.55	0.1 / 2.5
Mean Pre-Implantation Loss (%/Litter)	7.0	2.62	123	1.76 / 12.24	0.00 / 14.86	0.9 / 13.8
Mean Fetal Body Weight (GD 20) (g)	3.6	0.14	25	3.32 / 3.88	3.18 / 4.02	3.3 / 3.8
Males (g)	3.8	0.38	52	3.04 / 4.56	2.66 / 4.94	3.3 / 5.6
Females (g)	3.6	0.34	52	2.92 / 4.28	2.58 / 4.62	3.2 / 5.3
Mean Primordial Follicle Count of 10 Sections/Dam	110.4	34.48	22	41.44 / 179.36	6.96 / 213.84	50.4 / 180.5

N = Count of study means from control groups

Version 2.11

02-Aug-10

WIL Research Laboratories - Developmental and Reproductive Toxicology
Historical Control Summary of Pup Survival Indices (%)

Sex: Male/Female | Species: Rat | Number of Studies/Data Sets: 163 / 221
Study Type: All | Strain: Crl:CD(SD) | Range of Study Dates: 08/00 - 10/09
Age Range: 0 - 21 Days

	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
Mean Number of Pups Born	14.4	0.95	98	12.50 / 16.3	11.55 / 17.25	11.7 / 16.6
Survival (%)						
PND 0 (Relative to No. Born)	98.3	1.28	98	95.74 / 100.00	94.46 / 100.00	93.3 / 100.0
PND 0 to PND 1	98.9	1.03	96	96.84 / 100.00	95.81 / 100.00	94.6 / 100.0
PND 1 to PND 4 (Before Selection)	98.5	1.70	92	95.10 / 100.00	93.40 / 100.00	87.0 / 100.0
PND 4 (After Selection) to PND 7	99.0	1.41	91	96.18 / 100.00	94.77 / 100.00	91.7 / 100.0
PND 7 to PND 14	99.4	1.12	86	97.16 / 100.00	96.04 / 100.00	93.5 / 100.0
PND 14 to PND 21	99.6	1.01	86	97.58 / 100.00	96.57 / 100.00	94.7 / 100.0
PND 21 to PND 28	NA	NA	0	NA / NA	NA / NA	NA / NA
Birth to PND 4 (Before Selection)	95.8	2.42	86	90.96 / 100.00	88.54 / 100.00	83.8 / 98.7
PND 4 (After Selection) to PND 21	97.9	2.39	79	93.12 / 100.00	90.73 / 100.00	86.7 / 100.0
PND 4 (After Selection) to PND 28	NA	NA	0	NA / NA	NA / NA	NA / NA

N = Count of study means from control groups; NA = Not applicable

Version 2.11
02-Aug-10

WIL Research Laboratories - Developmental and Reproductive Toxicology

Historical Control Summary of Pup Body Weights (g)

Sex: Male/Female
Species: Rat
Number of Studies/Data Sets: 163 / 221
Study Type: All
Strain: Crl:CD(SD)
Range of Study Dates: 08/00 - 10/09
Age Range: 1 - 28 Days

Males (g)	PND	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
	PND 0	6.5	0.05	4	6.40 / 6.60	6.35 / 6.65	6.4 / 6.5
	PND 1	7.1	0.23	95	6.64 / 7.56	6.41 / 7.79	6.6 / 7.6
	PND 4	9.9	0.50	90	8.90 / 10.90	8.40 / 11.40	8.7 / 11.0
	PND 7	15.3	1.16	90	12.98 / 17.62	11.82 / 18.78	11.9 / 17.6
	PND 10	22.0	1.46	25	19.08 / 24.92	17.62 / 26.38	18.3 / 24.1
	PND 11	23.7	1.15	11	21.40 / 26.00	20.25 / 18.78	22.0 / 25.3
	PND 12	26.7	0.28	2	26.14 / 27.26	25.86 / 27.54	26.5 / 26.9
	PND 13	28.0	2.22	3	23.56 / 32.44	21.34 / 34.66	25.4 / 29.3
	PND 14	30.9	3.16	80	24.58 / 37.22	21.42 / 40.38	20.2 / 36.4
	PND 15	34.4	0.14	2	34.12 / 34.68	33.98 / 34.82	34.3 / 34.5
	PND 16	37.0	0.35	2	36.30 / 37.70	35.95 / 38.05	36.7 / 37.2
	PND 17	38.0	2.59	32	32.82 / 43.18	30.23 / 45.77	30.7 / 42.0
	PND 21	48.6	4.83	85	38.94 / 58.26	34.11 / 63.09	32.8 / 57.8
	PND 28	82.7	6.15	20	70.40 / 95.00	64.25 / 101.15	69.8 / 94.0

N = Count of study means from control groups; NA = Not applicable

WIL Research Laboratories - Developmental and Reproductive Toxicology

Historical Control Summary of Pup Body Weights (g)

Sex: Male/Female
Species: Rat
Number of Studies/Data Sets: 163 / 221
Study Type: All
Strain: Crl:CD(SD)
Range of Study Dates: 08/00 - 10/09
Age Range: 1 - 28 Days

Females (g)	PND	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
	PND 0	6.1	0.00	4	6.10 / 6.10	6.10 / 6.10	6.1 / 6.1
	PND 1	6.7	0.23	95	6.24 / 7.16	6.01 / 7.39	6.1 / 7.1
	PND 4	9.4	0.48	90	8.44 / 10.36	7.96 / 10.84	8.1 / 10.4
	PND 7	14.5	1.09	90	12.32 / 16.68	11.23 / 17.77	11.3 / 16.7
	PND 10	20.9	1.45	25	18.00 / 23.80	16.55 / 25.25	17.4 / 23.8
	PND 11	22.7	1.19	11	20.32 / 25.08	19.13 / 26.27	20.9 / 24.4
	PND 12	25.4	0.35	2	24.70 / 26.10	24.35 / 26.45	25.1 / 25.6
	PND 13	26.7	2.09	3	22.52 / 30.88	20.43 / 32.97	24.3 / 28.1
	PND 14	29.7	2.99	80	23.72 / 35.68	20.73 / 38.67	20.3 / 34.8
	PND 15	32.8	0.35	2	32.10 / 33.50	31.75 / 33.85	32.6 / 33.1
	PND 16	35.2	0.14	2	34.92 / 35.48	34.78 / 35.62	35.1 / 35.3
	PND 17	36.6	2.40	32	31.80 / 41.40	29.40 / 43.80	30.0 / 40.3
	PND 21	46.5	4.44	85	37.62 / 55.38	33.18 / 59.82	32.8 / 54.9
	PND 28	76.6	5.35	20	65.90 / 87.30	60.55 / 92.65	66.7 / 86.2

N = Count of study means from control groups; NA = Not applicable

WIL Research Laboratories - Developmental and Reproductive Toxicology
Historical Control Summary of Pup Organ Weights (PND 21)

Sex: Male/Female
Study Type: All
Species: Rat
Strain: Crl:CD(SD)
Age: 21 Days
Number of Studies/Number Data Sets: 163 / 221
Range of Study Dates: 08/00 - 10/09

Males

	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
Brain (g)	1.4548	0.04342	41	1.36796 / 1.54164	1.32454 / 1.58506	1.3451 / 1.5436
Spleen (g)	0.2196	0.04497	41	0.12966 / 0.30954	0.08469 / 0.35451	0.1471 / 0.3641
Thymus (g)	0.2075	0.03758	41	0.13234 / 0.28266	0.09476 / 0.32024	0.1617 / 0.3541

Females

Brain (g)	1.4067	0.03900	41	1.32870 / 1.48470	1.28970 / 1.52370	1.3142 / 1.5082
Spleen (g)	0.2149	0.04172	41	0.13146 / 0.29834	0.08974 / 0.34006	0.1401 / 0.3099
Thymus (g)	0.2086	0.03848	41	0.13164 / 0.28556	0.09316 / 0.32404	0.1669 / 0.3483

N = Count of study means from control groups

Version 2.11
02-Aug-10

WIL Research Laboratories - Developmental and Reproductive Toxicology

Historical Control Summary of Developmental Landmarks

Sex: Male/Female | Species: Rat | Number of Studies/Control Groups: 163 / 221

Study Type: All | Strain: Crl:CD(SD) | Range of Study Dates: 08/00 - 10/09

	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
Mean Male Anogenital Distance (PND1) (mm)	4.26	0.448	9	3.364 / 5.156	2.916 / 5.604	3.5 / 4.7
Mean Female Anogenital Distance (PND1) (mm)	2.35	0.282	9	1.786 / 2.914	1.504 / 3.196	1.8 / 2.7
Mean Day of Balanopreputial Separation	44.9	1.29	58	42.32 / 47.48	41.03 / 48.77	42.3 / 49.0
Mean Body Weight at Aquisition (g)	230.8	12.30	58	206.20 / 255.40	193.90 / 267.70	202.5 / 252.9
Mean Day of Vaginal Patency	33.2	1.05	58	31.10 / 35.30	30.05 / 36.35	31.3 / 37.0
Mean Body Weight at Aquisition (g)	110.4	5.28	58	99.84 / 120.96	94.56 / 126.24	99.3 / 123.2
Mean Day of Surface Righting Response						
Males	4.9	0.34	5	4.22 / 5.58	3.88 / 5.92	4.3 / 5.1
Females	5.0	0.31	5	4.38 / 5.62	4.07 / 5.93	4.5 / 5.3
Mean Day of Pinnal Detachment						
Males	4.1	0.12	6	3.86 / 4.34	3.74 / 4.46	4.0 / 4.3
Females	4.0	0.08	6	3.84 / 4.16	3.76 / 4.24	4.0 / 4.2
Mean Day of Eye Opening						
Males	15.8	1.12	7	13.56 / 18.04	12.44 / 19.16	14.5 / 17.8
Females	15.7	1.20	7	13.30 / 18.10	12.10 / 19.30	14.3 / 17.8
Mean Day of Air Drop Righting Reflex						
Males	14.9	NA	1	NA / NA	NA / NA	14.9 / 14.9
Females	14.9	NA	1	NA / NA	NA / NA	14.9 / 14.9
Mean Day of Hair Growth						
Males	13.5	1.43	4	10.64 / 16.36	9.21 / 17.79	11.7 / 15.0
Females	13.6	1.51	4	10.58 / 16.62	9.07 / 18.13	11.8 / 15.2
Mean Day of Incisor Eruption						
Males	10.1	0.83	8	8.44 / 11.76	7.61 / 12.59	8.9 / 11.4
Females	10.0	0.75	8	8.50 / 11.50	7.75 / 12.25	8.9 / 11.1
Mean Day of Negative Geotaxis						
Males	6.85	0.443	4	5.96 / 7.74	5.52 / 8.18	6.4 / 7.4
Females	7.00	0.392	4	6.22 / 7.78	5.82 / 8.18	6.6 / 7.5

N = Count of study means from control groups

Version 2.11

02-Aug-10

WIL Research Laboratories - Developmental and Reproductive Toxicology
Historical Control Summary of Male and Female Organ Weights (Necropsy)

Sex: Male/Female | Species: Rat | Number of Studies/Number Data Sets: 163 / 221
Study Type: All | Strain: Crl:CD(SD) | Range of Study Dates: 08/00 - 10/09

Males	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
Mean Age of Males at Necropsy (weeks)	20.9	4.19	134	12.52 / 29.28	8.33 / 33.47	13.0 / 31.0
Mean Seminal Vesicle/Coagulating Gland Weight (g)	2.19	0.189	83	1.812 / 2.568	1.623 / 2.757	1.82 / 2.59
Mean Prostate Weight (g)	1.06	0.097	82	0.866 / 1.254	0.769 / 1.351	0.85 / 1.29
Mean Right Testis Weight (g)	1.79	0.068	111	1.654 / 1.926	1.586 / 1.994	1.65 / 1.96
Mean Left Testis Weight (g)	1.79	0.073	111	1.644 / 1.936	1.571 / 2.009	1.66 / 2.09
Mean Right Epidymis Weight (g)	0.73	0.044	111	0.642 / 0.818	0.598 / 0.862	0.63 / 0.83
Mean Left Epidymis Weight (g)	0.70	0.040	111	0.620 / 0.780	0.580 / 0.820	0.61 / 0.78
Mean Right Cauda Epidymis Weight (g)	0.3344	0.02495	110	0.28450 / 0.38430	0.25955 / 0.40925	0.2629 / 0.3939
Mean Left Cauda Epidymis Weight (g)	0.3265	0.02119	110	0.28412 / 0.36888	0.26293 / 0.39007	0.2655 / 0.3726
Mean Brain Weight (g)	2.11	0.048	98	2.014 / 2.206	1.966 / 2.254	1.99 / 2.20
Mean Pituitary Weight (g)	0.015	0.0015	65	0.0120 / 0.0180	0.0105 / 0.0195	0.0124 / 0.0219
Mean Adrenal Weight (g)	0.059	0.0104	47	0.0382 / 0.0798	0.0278 / 0.0902	0.0144 / 0.0776
Females						
Mean Age of Females at Necropsy (weeks)	19.6	3.60	179	12.40 / 26.80	8.80 / 30.40	14.0 / 31.0
Mean Combined Ovary/Oviduct Weight (g)	0.1577	0.02146	59	0.11478 / 0.20062	0.09332 / 0.22208	0.0991 / 0.1839
Mean Combined Ovary w/o Oviduct Weight (g)	0.1200	0.00805	22	0.10390 / 0.13610	0.09585 / 0.14415	0.0957 / 0.1328
Mean Brain Weight (g)	1.95	0.045	84	1.860 / 2.040	1.815 / 2.085	1.86 / 2.05
Mean Pituitary Weight (g)	0.018	0.0019	68	0.0142 / 0.0218	0.0123 / 0.0237	0.0138 / 0.0223
Mean Adrenal Weight (g)	0.074	0.0136	47	0.0468 / 0.1012	0.0332 / 0.1148	0.0174 / 0.0896

N = Count of study means from control groups

Version 2.11
11-Oct-10

WIL Research Laboratories - Developmental and Reproductive Toxicology
Historical Control Summary of Sperm Concentration and Morphology

Sex: Male/Female | Species: Rat | Number of Studies/Control Groups: 163 / 221
Study Type: All | Strain: Crl:CD(SD) | Range of Study Dates: 08/00 - 10/09

Mean Sperm Concentration (millions/ gram of tissue)	Mean	S.D.	N	Mean -/+ 2 S.D.	Mean -/+ 3 S.D.	Min/Max Value
Left Testis	79.8	8.30	88	63.20 / 96.40	54.90 / 104.70	59.8 / 102.5
Left Epididymis	419.9	58.58	93	302.74 / 537.06	244.16 / 595.64	307.6 / 619.2
Left Cauda Epididymis	659.7	57.48	7	544.74 / 774.66	487.26 / 832.14	568.0 / 738.9
Mean Sperm Production Rate (millions/ gram of tissue/ day)	13.1	1.36	86	10.38 / 15.82	9.02 / 17.18	9.8 / 16.8
Mean Sperm Motility (%)	86.8	3.58	101	79.64 / 93.96	76.06 / 97.54	78.9 / 94.0
Mean Progressive Sperm Motility (%)	73.9	3.91	45	66.08 / 81.72	62.17 / 85.63	62.0 / 81.0
Sperm Morphology Differential Count (%)						
Normal	99.3	0.74	97	97.82 / 100.00	97.08 / 100.00	96.1 / 100.0
Normal Head Separated from Flagellum	0.3	0.35	97	0.00 / 1.00	0.00 / 1.35	0.0 / 1.8
Head Absent w/ Normal Flagellum	0.3	0.34	97	0.00 / 0.98	0.00 / 1.32	0.0 / 2.3
Head Absent w/ Abnormal Flagellum	0.0	0.00	97	0.00 / 0.00	0.00 / 0.00	0.0 / 0.0
Misshapen Head w/ Normal Flagellum	0.0	0.12	97	0.00 / 0.24	0.00 / 0.36	0.0 / 1.1
Misshapen Head w/ Abnormal Flagellum	0.0	0.04	97	0.00 / 0.08	0.00 / 0.12	0.0 / 0.4
Degenerative Flagellar Defects w/ Normal Head	0.0	0.00	97	0.00 / 0.00	0.00 / 0.00	0.0 / 0.0
Other Flagellar Defects w/ Normal Head	0.0	0.00	97	0.00 / 0.00	0.00 / 0.00	0.0 / 0.0

N = Count of study means from control groups

Version 2.11
02-Aug-10

APPENDIX P

Individual Animal Data

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81983	M	SHAM CONTROL	NORMAL	09-16-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81983	M	SHAM CONTROL	DISPOSITION	10-21-10	12:43	P	SCHEDULED EUTHANASIA
81990	M	SHAM CONTROL	NORMAL	09-16-10	8:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81990	M	SHAM CONTROL	DISPOSITION	10-21-10	12:43	P	SCHEDULED EUTHANASIA
82004	M	SHAM CONTROL	NORMAL	09-16-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82004	M	SHAM CONTROL	DISPOSITION	10-21-10	12:43	P	SCHEDULED EUTHANASIA
82012	M	SHAM CONTROL	NORMAL	09-16-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82012	M	SHAM CONTROL	DISPOSITION	10-22-10	12:10	P	SCHEDULED EUTHANASIA
82012	M	SHAM CONTROL	BODY/INTEGUMENT	09-30-10	7:25	1	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82012	M	SHAM CONTROL	BODY/INTEGUMENT	09-30-10	7:25	1	HAIR LOSS LEFT FORELIMB
				10-06-10	7:29	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	6:55	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:28	1	HAIR LOSS RIGHT FORELIMB
82017	M	SHAM CONTROL	NORMAL	09-16-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82017	M	SHAM CONTROL	DISPOSITION	10-22-10	12:10	P	SCHEDULED EUTHANASIA
82017	M	SHAM CONTROL	BODY/INTEGUMENT	10-20-10	12:03	P	LEFT TESTICLE UNDESCENDED
81988	M	0 MG/KG	NORMAL	09-16-10	6:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81988	M	0 MG/KG	DISPOSITION	10-22-10	12:10	P	SCHEDULED EUTHANASIA
81989	M	0 MG/KG	NORMAL	09-16-10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81989	M	0 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81991	M	0 MG/KG	NORMAL	09-16-10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81991	M	0 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
81996	M	0 MG/KG	NORMAL	09-16-10	7:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81996	M	0 MG/KG	DISPOSITION	10-21-10	12:43	P	SCHEDULED EUTHANASIA
81996	M	0 MG/KG	ORAL/DENTAL	09-27-10	10:44	P	SWOLLEN UPPER LIP
81997	M	0 MG/KG	NORMAL	09-16-10	7:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81997	M	0 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
81997	M	0 MG/KG	BODY/INTEGUMENT	10-20-10	7:32	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:32	1	HAIR LOSS LEFT FORELIMB
				10-21-10	12:20	1	HAIR LOSS RIGHT FORELIMB
				10-21-10	12:20	1	HAIR LOSS LEFT FORELIMB
81998	M	0 MG/KG	NORMAL	09-16-10	7:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81998	M	0 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
81998	M	0 MG/KG	BODY/INTEGUMENT	09-30-10	7:30	1	HAIR LOSS RIGHT FORELIMB
				09-30-10	7:30	1	HAIR LOSS LEFT FORELIMB
				10-06-10	7:34	1	HAIR LOSS RIGHT FORELIMB
				10-06-10	7:34	1	HAIR LOSS LEFT FORELIMB
				10-13-10	6:59	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	6:59	1	HAIR LOSS LEFT FORELIMB
				10-20-10	7:33	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:33	1	HAIR LOSS LEFT FORELIMB
				10-21-10	12:22	1	HAIR LOSS RIGHT FORELIMB
				10-21-10	12:22	1	HAIR LOSS LEFT FORELIMB
				10-21-10	12:22	P	SCABBING LEFT FORELIMB
82014	M	0 MG/KG	NORMAL	09-16-10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	6:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82014	M	0 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82014	M	0 MG/KG	ORAL/DENTAL	10-22-10	11:47	1	DRIED CLEAR MATERIAL AROUND MOUTH
82020	M	0 MG/KG	NORMAL	09-16-10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82020	M	0 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82021	M	0 MG/KG	NORMAL	09-16-10	7:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82021	M	0 MG/KG	NORMAL	09-23-10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82021	M	0 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82025	M	0 MG/KG	NORMAL	09-16-10	7:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82025	M	0 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82025	M	0 MG/KG	BODY/INTEGUMENT	10-06-10	7:36	1	WET YELLOW MATERIAL UROGENITAL AREA
82025	M	0 MG/KG	EYES/EARS/NOSE	10-06-10	7:36	1	DRIED RED MATERIAL AROUND NOSE
82038	M	0 MG/KG	NORMAL	09-16-10	7:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82038	M	0 MG/KG	DISPOSITION	10-21-10	12:46	P	SCHEDULED EUTHANASIA
82041	M	0 MG/KG	NORMAL	09-16-10	7:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82041	M	0 MG/KG	DISPOSITION	10-22-10	12:13	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82041	M	0 MG/KG	BODY/INTEGUMENT	10-13-10	7:02	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	7:42	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-22-10	11:51	1	HAIR LOSS RIGHT FORELIMB
81982	M	100 MG/KG	NORMAL	09-16-10	7:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81982	M	100 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
81982	M	100 MG/KG	BODY/INTEGUMENT	09-23-10	7:37	2	HAIR LOSS RIGHT FORELIMB
				09-23-10	7:37	2	HAIR LOSS LEFT FORELIMB
				09-30-10	7:34	2	HAIR LOSS RIGHT FORELIMB
				09-30-10	7:34	2	HAIR LOSS LEFT FORELIMB
				10-06-10	7:38	2	HAIR LOSS RIGHT FORELIMB
				10-06-10	7:38	2	HAIR LOSS LEFT FORELIMB
				10-13-10	7:04	2	HAIR LOSS RIGHT FORELIMB
				10-13-10	7:04	2	HAIR LOSS LEFT FORELIMB
				10-20-10	7:43	2	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:43	2	HAIR LOSS LEFT FORELIMB
				10-20-10	7:43	P	SCABBING RIGHT FORELIMB
				10-20-10	7:43	P	SCABBING LEFT FORELIMB
				10-22-10	11:41	1	HAIR LOSS LEFT FORELIMB
				10-22-10	11:41	2	HAIR LOSS RIGHT FORELIMB
81987	M	100 MG/KG	NORMAL	09-16-10	7:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81987	M	100 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
81994	M	100 MG/KG	NORMAL	09-16-10	7:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81994	M	100 MG/KG	NORMAL	09-30-10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81994	M	100 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
81994	M	100 MG/KG	EYES/EARS/NOSE	10-13-10	7:05	1	DRIED RED MATERIAL AROUND NOSE
82001	M	100 MG/KG	NORMAL	09-16-10	7:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82001	M	100 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
82001	M	100 MG/KG	BODY/INTEGUMENT	10-13-10	7:05	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	7:45	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-21-10	12:21	1	HAIR LOSS VENTRAL ABDOMINAL AREA
82001	M	100 MG/KG	EYES/EARS/NOSE	10-06-10	7:41	1	DRIED RED MATERIAL AROUND NOSE
82003	M	100 MG/KG	NORMAL	09-16-10	7:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82003	M	100 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
82007	M	100 MG/KG	NORMAL	09-16-10	7:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82007	M	100 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
82011	M	100 MG/KG	NORMAL	09-16-10	7:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82011	M	100 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82011	M	100 MG/KG	BODY/INTEGUMENT	10-13-10	7:07	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	7:46	1	DRIED YELLOW MATERIAL UROGENITAL AREA
82016	M	100 MG/KG	NORMAL	09-16-10	7:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82016	M	100 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82022	M	100 MG/KG	NORMAL	09-16-10	7:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82022	M	100 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82024	M	100 MG/KG	NORMAL	09-16-10	7:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82024	M	100 MG/KG	NORMAL	10-13-10	7:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82024	M	100 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82034	M	100 MG/KG	NORMAL	09-16-10	7:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82034	M	100 MG/KG	DISPOSITION	10-22-10	12:13	P	SCHEDULED EUTHANASIA
82046	M	100 MG/KG	NORMAL	09-16-10	7:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82046	M	100 MG/KG	DISPOSITION	10-21-10	12:46	P	SCHEDULED EUTHANASIA
82046	M	100 MG/KG	BODY/INTEGUMENT	10-13-10	7:10	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	7:10	1	HAIR LOSS LEFT FORELIMB
				10-13-10	7:10	P	SCABBING LEFT FORELIMB
				10-20-10	7:48	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:48	1	HAIR LOSS LEFT FORELIMB
				10-21-10	12:28	1	HAIR LOSS RIGHT FORELIMB
				10-21-10	12:28	1	HAIR LOSS LEFT FORELIMB
81993	M	300 MG/KG	NORMAL	09-16-10	7:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81993	M	300 MG/KG	NORMAL	10-20-10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81993	M	300 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
81995	M	300 MG/KG	NORMAL	09-16-10	7:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81995	M	300 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
82000	M	300 MG/KG	NORMAL	09-16-10	7:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82000	M	300 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
82002	M	300 MG/KG	NORMAL	09-16-10	7:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82002	M	300 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
82002	M	300 MG/KG	BODY/INTEGUMENT	10-13-10	7:12	1	HAIR LOSS UROGENITAL AREA
				10-20-10	7:50	1	HAIR LOSS UROGENITAL AREA
82005	M	300 MG/KG	NORMAL	09-16-10	7:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82005	M	300 MG/KG	NORMAL	09-30-10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82005	M	300 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82013	M	300 MG/KG	NORMAL	09-16-10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82013	M	300 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82013	M	300 MG/KG	EYES/EARS/NOSE	10-13-10	7:13	1	DRIED RED MATERIAL AROUND NOSE
82015	M	300 MG/KG	NORMAL	09-16-10	7:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82015	M	300 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82015	M	300 MG/KG	BODY/INTEGUMENT	10-13-10	7:14	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	7:52	1	HAIR LOSS RIGHT HINDLIMB
				10-20-10	7:52	1	HAIR LOSS DORSAL HEAD
				10-20-10	7:52	P	SCABBING DORSAL HEAD
				10-22-10	11:48	1	HAIR LOSS RIGHT HINDLIMB
				10-22-10	11:48	1	HAIR LOSS UROGENITAL AREA
82023	M	300 MG/KG	NORMAL	09-16-10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82023	M	300 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82023	M	300 MG/KG	BODY/INTEGUMENT	10-13-10	7:14	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	7:14	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:15	2	DRIED YELLOW MATERIAL LEFT HINDLIMB
				10-20-10	7:53	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-21-10	12:25	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-21-10	12:25	1	HAIR LOSS UROGENITAL AREA
82031	M	300 MG/KG	NORMAL	09-16-10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82031	M	300 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82031	M	300 MG/KG	EYES/EARS/NOSE	10-06-10	7:49	1	DRIED RED MATERIAL AROUND NOSE
				10-21-10	12:27	1	DRIED RED MATERIAL AROUND NOSE
82036	M	300 MG/KG	NORMAL	09-16-10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82036	M	300 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82036	M	300 MG/KG	BODY/INTEGUMENT	10-13-10	7:16	1	HAIR LOSS LEFT FORELIMB
				10-20-10	7:54	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:54	1	HAIR LOSS LEFT FORELIMB
				10-20-10	7:54	P	SCABBING LEFT FORELIMB
				10-22-10	11:50	1	HAIR LOSS RIGHT FORELIMB
				10-22-10	11:50	2	HAIR LOSS LEFT FORELIMB
82036	M	300 MG/KG	EYES/EARS/NOSE	09-30-10	7:47	1	DRIED RED MATERIAL AROUND NOSE
82039	M	300 MG/KG	NORMAL	09-16-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82039	M	300 MG/KG	NORMAL	10-06-10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82039	M	300 MG/KG	DISPOSITION	10-22-10	12:13	P	SCHEDULED EUTHANASIA
82039	M	300 MG/KG	BODY/INTEGUMENT	10-13-10	7:16	1	HAIR LOSS UROGENITAL AREA
				10-20-10	7:54	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:54	1	HAIR LOSS LEFT FORELIMB
				10-20-10	7:54	P	SCABBING RIGHT FORELIMB
				10-20-10	7:54	P	SCABBING LEFT FORELIMB
				10-20-10	7:54	1	HAIR LOSS UROGENITAL AREA
				10-22-10	11:52	1	HAIR LOSS RIGHT FORELIMB
				10-22-10	11:52	1	HAIR LOSS LEFT FORELIMB
				10-22-10	11:52	P	SCABBING RIGHT FORELIMB
				10-22-10	11:52	1	HAIR LOSS UROGENITAL AREA
82044	M	300 MG/KG	NORMAL	09-16-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82044	M	300 MG/KG	DISPOSITION	10-21-10	12:46	P	SCHEDULED EUTHANASIA
82006	M	900 MG/KG	NORMAL	09-16-10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82006	M	900 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA
82006	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:49	1	HAIR LOSS RIGHT FORELIMB
				09-30-10	7:49	1	HAIR LOSS LEFT FORELIMB
				10-06-10	7:51	2	HAIR LOSS RIGHT FORELIMB
				10-06-10	7:51	1	HAIR LOSS LEFT FORELIMB
				10-06-10	7:51	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:52	P	SCABBING RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82006	M	900 MG/KG	BODY/INTEGUMENT	10-13-10	7:17	2	HAIR LOSS RIGHT FORELIMB
				10-13-10	7:17	1	HAIR LOSS LEFT FORELIMB
				10-13-10	7:17	P	SCABBING RIGHT FORELIMB
				10-13-10	7:17	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:17	2	HAIR LOSS UROGENITAL AREA
				10-20-10	7:55	2	HAIR LOSS RIGHT FORELIMB
				10-20-10	7:55	1	HAIR LOSS LEFT FORELIMB
				10-20-10	7:55	2	HAIR LOSS UROGENITAL AREA
				10-20-10	7:56	P	SCABBING RIGHT FORELIMB
				10-21-10	12:19	2	HAIR LOSS RIGHT FORELIMB
				10-21-10	12:19	1	HAIR LOSS LEFT FORELIMB
				10-21-10	12:20	P	SCABBING RIGHT FORELIMB
				10-21-10	12:20	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-21-10	12:20	2	HAIR LOSS UROGENITAL AREA
82009	M	900 MG/KG	NORMAL	09-16-10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82009	M	900 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
82009	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:50	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:52	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:52	1	HAIR LOSS UROGENITAL AREA
				10-13-10	7:18	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:18	2	HAIR LOSS UROGENITAL AREA
				10-20-10	7:56	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	7:56	1	HAIR LOSS UROGENITAL AREA
				10-22-10	11:42	2	HAIR LOSS UROGENITAL AREA
82009	M	900 MG/KG	ORAL/DENTAL	10-06-10	7:53	1	DRIED CLEAR MATERIAL AROUND MOUTH
82010	M	900 MG/KG	NORMAL	09-16-10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82010	M	900 MG/KG	DISPOSITION	10-21-10	12:44	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82010	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:51	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:53	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:18	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:18	2	HAIR LOSS UROGENITAL AREA
				10-20-10	7:57	2	HAIR LOSS UROGENITAL AREA
				10-20-10	7:57	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-21-10	12:22	1	HAIR LOSS UROGENITAL AREA
82010	M	900 MG/KG	EYES/EARS/NOSE	09-30-10	7:51	1	DRIED RED MATERIAL AROUND NOSE
82010	M	900 MG/KG	ORAL/DENTAL	09-30-10	7:51	2	DRIED CLEAR MATERIAL AROUND MOUTH
82018	M	900 MG/KG	NORMAL	09-16-10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82018	M	900 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82018	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:51	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:54	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	7:54	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:54	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	7:19	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:19	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	7:19	1	HAIR LOSS UROGENITAL AREA
				10-20-10	7:58	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	7:58	1	HAIR LOSS UROGENITAL AREA
				10-20-10	7:58	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-21-10	12:24	1	HAIR LOSS LEFT HINDLIMB
				10-21-10	12:24	1	HAIR LOSS UROGENITAL AREA
82028	M	900 MG/KG	NORMAL	09-16-10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82028	M	900 MG/KG	DISPOSITION	10-22-10	12:11	P	SCHEDULED EUTHANASIA
82028	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:52	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:55	1	DRIED YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82028	M	900 MG/KG	BODY/INTEGUMENT	10-06-10	7:55	1	HAIR LOSS UROGENITAL AREA
				10-13-10	7:19	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:19	1	HAIR LOSS UROGENITAL AREA
				10-20-10	7:58	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	7:58	1	HAIR LOSS UROGENITAL AREA
				10-22-10	11:44	1	HAIR LOSS UROGENITAL AREA
82029	M	900 MG/KG	NORMAL	09-16-10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82029	M	900 MG/KG	DISPOSITION	10-21-10	12:45	P	SCHEDULED EUTHANASIA
82029	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:53	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:56	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:56	2	HAIR LOSS UROGENITAL AREA
				10-06-10	7:56	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	7:56	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	7:20	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:20	2	HAIR LOSS UROGENITAL AREA
				10-13-10	7:20	2	HAIR LOSS LEFT HINDLIMB
				10-20-10	7:59	2	HAIR LOSS LEFT HINDLIMB
				10-20-10	7:59	2	HAIR LOSS UROGENITAL AREA
				10-21-10	12:26	2	HAIR LOSS UROGENITAL AREA
				10-21-10	12:26	2	HAIR LOSS LEFT HINDLIMB
82030	M	900 MG/KG	NORMAL	09-16-10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82030	M	900 MG/KG	DISPOSITION	10-21-10	12:46	P	SCHEDULED EUTHANASIA
82030	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:56	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:59	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	7:59	1	HAIR LOSS UROGENITAL AREA
				10-13-10	7:21	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:21	2	HAIR LOSS UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82030	M	900 MG/KG	BODY/INTEGUMENT	10-20-10	8:00	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	8:00	2	HAIR LOSS UROGENITAL AREA
				10-21-10	12:28	2	HAIR LOSS UROGENITAL AREA
82035	M	900 MG/KG	NORMAL	09-16-10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82035	M	900 MG/KG	DISPOSITION	10-21-10	12:46	P	SCHEDULED EUTHANASIA
82035	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:57	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	8:00	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	8:00	1	HAIR LOSS UROGENITAL AREA
				10-13-10	7:21	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:21	1	HAIR LOSS UROGENITAL AREA
				10-20-10	8:00	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:00	1	HAIR LOSS UROGENITAL AREA
				10-21-10	12:29	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-21-10	12:29	1	HAIR LOSS UROGENITAL AREA
82035	M	900 MG/KG	ORAL/DENTAL	09-30-10	7:57	2	DRIED CLEAR MATERIAL AROUND MOUTH
82037	M	900 MG/KG	NORMAL	09-16-10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82037	M	900 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82037	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	7:57	1	HAIR LOSS RIGHT FORELIMB
				09-30-10	7:57	1	HAIR LOSS LEFT FORELIMB
				09-30-10	7:57	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				09-30-10	7:58	2	HAIR LOSS RIGHT HINDLIMB
				09-30-10	7:58	1	HAIR LOSS RUMP
				10-06-10	8:00	2	HAIR LOSS RIGHT FORELIMB
				10-06-10	8:00	1	HAIR LOSS LEFT FORELIMB
				10-06-10	8:01	P	SCABBING RIGHT FORELIMB
				10-06-10	8:01	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	8:01	2	HAIR LOSS UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82037	M	900 MG/KG	BODY/INTEGUMENT	10-06-10	8:01	2	HAIR LOSS RUMP
				10-13-10	7:22	2	HAIR LOSS RIGHT FORELIMB
				10-13-10	7:22	1	HAIR LOSS LEFT FORELIMB
				10-13-10	7:22	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	7:22	3	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:22	2	HAIR LOSS UROGENITAL AREA
				10-13-10	7:22	1	HAIR LOSS RUMP
				10-20-10	8:01	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	8:01	1	HAIR LOSS LEFT FORELIMB
				10-20-10	8:01	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:01	2	HAIR LOSS UROGENITAL AREA
				10-20-10	8:01	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-22-10	11:46	2	HAIR LOSS RIGHT FORELIMB
				10-22-10	11:46	2	HAIR LOSS LEFT FORELIMB
				10-22-10	11:46	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-22-10	11:46	2	HAIR LOSS UROGENITAL AREA
82040	M	900 MG/KG	NORMAL	09-16-10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82040	M	900 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82040	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:00	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	8:02	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	7:23	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	7:23	1	HAIR LOSS UROGENITAL AREA
				10-20-10	8:01	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	8:01	1	HAIR LOSS LEFT FORELIMB
				10-20-10	8:01	1	HAIR LOSS UROGENITAL AREA
				10-20-10	8:01	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-22-10	11:48	1	HAIR LOSS RIGHT FORELIMB
				10-22-10	11:48	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82040	M	900 MG/KG	BODY/INTEGUMENT	10-22-10	11:49	1	HAIR LOSS UROGENITAL AREA
82042	M	900 MG/KG	NORMAL	09-16-10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82042	M	900 MG/KG	DISPOSITION	10-22-10	12:12	P	SCHEDULED EUTHANASIA
82042	M	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:01	2	HAIR LOSS LEFT HINDLIMB
				09-30-10	8:01	2	HAIR LOSS VENTRAL THORACIC AREA
				09-30-10	8:01	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				09-30-10	8:02	1	HAIR LOSS UROGENITAL AREA
				10-06-10	8:02	1	HAIR LOSS RIGHT FORELIMB
				10-06-10	8:02	1	HAIR LOSS LEFT FORELIMB
				10-06-10	8:02	2	HAIR LOSS VENTRAL THORACIC AREA
				10-06-10	8:02	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:02	2	HAIR LOSS UROGENITAL AREA
				10-06-10	8:03	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	7:24	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	7:24	1	HAIR LOSS LEFT FORELIMB
				10-13-10	7:24	2	HAIR LOSS VENTRAL THORACIC AREA
				10-13-10	7:24	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	7:24	1	HAIR LOSS UROGENITAL AREA
				10-13-10	7:24	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:02	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	8:02	1	HAIR LOSS LEFT FORELIMB
				10-20-10	8:02	2	HAIR LOSS VENTRAL THORACIC AREA
				10-20-10	8:02	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:02	1	HAIR LOSS UROGENITAL AREA
				10-20-10	8:02	1	HAIR LOSS LEFT HINDLIMB
				10-22-10	11:50	1	HAIR LOSS RIGHT FORELIMB
				10-22-10	11:50	1	HAIR LOSS LEFT FORELIMB
				10-22-10	11:50	1	HAIR LOSS VENTRAL THORACIC AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82042	M	900 MG/KG	BODY/INTEGUMENT	10-22-10	11:50	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-22-10	11:50	1	HAIR LOSS UROGENITAL AREA
				10-22-10	11:51	1	HAIR LOSS LEFT HINDLIMB
82043	M	900 MG/KG	NORMAL	09-16-10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	7:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82043	M	900 MG/KG	DISPOSITION	10-22-10	12:13	P	SCHEDULED EUTHANASIA
82043	M	900 MG/KG	BODY/INTEGUMENT	10-13-10	7:24	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	7:24	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	7:25	1	HAIR LOSS RIGHT HINDLIMB
				10-13-10	7:25	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				10-13-10	7:26	2	HAIR LOSS DORSAL NECK
				10-20-10	8:03	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:03	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:03	1	HAIR LOSS RIGHT HINDLIMB
				10-20-10	8:03	2	HAIR LOSS DORSAL NECK
				10-22-10	11:53	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-22-10	11:53	1	HAIR LOSS UROGENITAL AREA
				10-22-10	11:53	1	HAIR LOSS LEFT HINDLIMB
				10-22-10	11:54	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
81985	M	60 MG/KG CYC	NORMAL	09-16-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81985	M	60 MG/KG CYC	DISPOSITION	10-21-10	12:43	P	SCHEDULED EUTHANASIA
81985	M	60 MG/KG CYC	BODY/INTEGUMENT	10-21-10	12:18	1	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A1 (F0 MALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81992	M	60 MG/KG CYC	NORMAL	09-16-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81992	M	60 MG/KG CYC	DISPOSITION	10-21-10	12:43	P	SCHEDULED EUTHANASIA
81992	M	60 MG/KG CYC	BODY/INTEGUMENT	09-30-10	8:07	1	HAIR LOSS LEFT FORELIMB
				10-06-10	8:05	1	HAIR LOSS LEFT FORELIMB
				10-13-10	7:27	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	7:27	1	HAIR LOSS LEFT FORELIMB
				10-20-10	8:06	1	HAIR LOSS LEFT FORELIMB
82008	M	60 MG/KG CYC	NORMAL	09-16-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82008	M	60 MG/KG CYC	DISPOSITION	10-22-10	12:10	P	SCHEDULED EUTHANASIA
82008	M	60 MG/KG CYC	BODY/INTEGUMENT	10-22-10	11:38	3	WET YELLOW MATERIAL UROGENITAL AREA
				10-22-10	11:39	3	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-22-10	11:39	2	WET YELLOW MATERIAL VENTRAL THORACIC AREA
82008	M	60 MG/KG CYC	ORAL/DENTAL	10-22-10	11:40	P	SCABBING AROUND MOUTH
				10-22-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
82026	M	60 MG/KG CYC	NORMAL	09-16-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82026	M	60 MG/KG CYC	DISPOSITION	10-22-10	12:10	P	SCHEDULED EUTHANASIA
82026	M	60 MG/KG CYC	ORAL/DENTAL	10-22-10	11:40	1	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-16-10 TO 10-22-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82033	M	60 MG/KG CYC	NORMAL	09-16-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82033	M	60 MG/KG CYC	DISPOSITION	10-22-10	12:10	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81924	F	SHAM CONTROL	NORMAL	09-16-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924	F	SHAM CONTROL	DISPOSITION	11-02-10	12:36	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81940	F	SHAM CONTROL	NORMAL	09-16-10	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	12:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940	F	SHAM CONTROL	DISPOSITION	11-04-10	12:46	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81944	F	SHAM CONTROL	NORMAL	09-16-10	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-05-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944	F	SHAM CONTROL	DISPOSITION	11-05-10	11:40	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81944	F	SHAM CONTROL	EYES/EARS/NOSE	10-06-10	8:14	1	DRIED RED MATERIAL AROUND NOSE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81952	F	SHAM CONTROL	NORMAL	09-16-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	7:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952	F	SHAM CONTROL	DISPOSITION	11-02-10	12:36	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81963	F	SHAM CONTROL	NORMAL	09-16-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963	F	SHAM CONTROL	DISPOSITION	11-03-10	12:16	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81920	F	0 MG/KG	NORMAL	09-16-10	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920	F	0 MG/KG	DISPOSITION	11-03-10	12:38	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81920	F	0 MG/KG	BODY/INTEGUMENT	10-27-10	8:13	1	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:05	2	HAIR LOSS RIGHT FORELIMB
81932	F	0 MG/KG	NORMAL	09-16-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81932	F	0 MG/KG	NORMAL	09-30-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81932	F	0 MG/KG	DISPOSITION	11-01-10	13:58	P	SCHEDULED EUTHANASIA; POST-MATING DAY 25
81938	F	0 MG/KG	NORMAL	09-16-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938	F	0 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81938	F	0 MG/KG	BODY/INTEGUMENT	10-13-10	8:01	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:01	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:01	1	HAIR LOSS RIGHT HINDLIMB
				10-13-10	8:02	P	SCABBING LEFT HINDLIMB
				10-20-10	8:14	1	HAIR LOSS LEFT HINDLIMB
				10-27-10	8:15	1	HAIR LOSS LEFT HINDLIMB
				11-03-10	7:06	1	HAIR LOSS LEFT HINDLIMB
81939	F	0 MG/KG	NORMAL	09-16-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939	F	0 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81939	F	0 MG/KG	EYES/EARS/NOSE	10-13-10	8:02	1	DRIED RED MATERIAL AROUND NOSE
81942	F	0 MG/KG	NORMAL	09-16-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81942	F	0 MG/KG	NORMAL	09-23-10	8:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942	F	0 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81950	F	0 MG/KG	NORMAL	09-16-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950	F	0 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81958	F	0 MG/KG	NORMAL	09-16-10	8:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958	F	0 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81966	F	0 MG/KG	NORMAL	09-16-10	8:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81966	F	0 MG/KG	NORMAL	10-13-10	8:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81966	F	0 MG/KG	DISPOSITION	11-01-10	13:58	P	SCHEDULED EUTHANASIA; POST-MATING DAY 25
81966	F	0 MG/KG	EYES/EARS/NOSE	09-30-10	8:22	1	DRIED RED MATERIAL AROUND NOSE
81967	F	0 MG/KG	NORMAL	09-16-10	8:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967	F	0 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81971	F	0 MG/KG	NORMAL	09-16-10	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81971	F	0 MG/KG	DISPOSITION	11-01-10	13:59	P	SCHEDULED EUTHANASIA; POST-MATING DAY 25
81975	F	0 MG/KG	NORMAL	09-16-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81975	F	0 MG/KG	NORMAL	10-20-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975	F	0 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81975	F	0 MG/KG	BODY/INTEGUMENT	11-02-10	12:26	1	HAIR LOSS LEFT FORELIMB
81979	F	0 MG/KG	NORMAL	09-16-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979	F	0 MG/KG	DISPOSITION	11-02-10	12:36	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81915	F	100 MG/KG	NORMAL	09-16-10	8:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915	F	100 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81915	F	100 MG/KG	BODY/INTEGUMENT	09-30-10	8:26	1	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:22	1	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:22	1	HAIR LOSS LEFT FORELIMB
				11-03-10	7:10	1	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:10	1	HAIR LOSS LEFT FORELIMB
				11-04-10	12:37	1	HAIR LOSS RIGHT FORELIMB
				11-04-10	12:37	1	HAIR LOSS LEFT FORELIMB
81916	F	100 MG/KG	NORMAL	09-16-10	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81916	F	100 MG/KG	NORMAL	10-13-10	8:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916	F	100 MG/KG	DISPOSITION	11-03-10	12:38	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81916	F	100 MG/KG	BODY/INTEGUMENT	11-03-10	7:10	1	HAIR LOSS LEFT FORELIMB
81916	F	100 MG/KG	EYES/EARS/NOSE	10-06-10	8:23	1	DRIED RED MATERIAL AROUND NOSE
81917	F	100 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81917	F	100 MG/KG	BODY/INTEGUMENT	09-16-10	8:31	1	HAIR LOSS RIGHT FORELIMB
				09-16-10	8:31	1	HAIR LOSS LEFT FORELIMB
				09-23-10	8:16	2	HAIR LOSS RIGHT FORELIMB
				09-23-10	8:16	2	HAIR LOSS LEFT FORELIMB
				09-30-10	8:28	2	HAIR LOSS RIGHT FORELIMB
				09-30-10	8:28	2	HAIR LOSS LEFT FORELIMB
				09-30-10	8:28	2	HAIR LOSS RIGHT HINDLIMB
				09-30-10	8:28	2	HAIR LOSS LEFT HINDLIMB
				10-06-10	8:24	2	HAIR LOSS RIGHT FORELIMB
				10-06-10	8:24	2	HAIR LOSS LEFT FORELIMB
				10-06-10	8:24	2	HAIR LOSS RIGHT HINDLIMB
				10-06-10	8:24	2	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:06	2	HAIR LOSS RIGHT FORELIMB
				10-13-10	8:06	2	HAIR LOSS LEFT FORELIMB
				10-13-10	8:06	1	HAIR LOSS RIGHT HINDLIMB
				10-13-10	8:06	2	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:18	2	HAIR LOSS RIGHT FORELIMB
				10-20-10	8:18	2	HAIR LOSS LEFT FORELIMB
				10-20-10	8:18	1	HAIR LOSS RIGHT HINDLIMB
				10-20-10	8:19	2	HAIR LOSS LEFT HINDLIMB
				10-27-10	8:23	2	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:23	2	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81917	F	100 MG/KG	BODY/INTEGUMENT	10-27-10	8:23	2	HAIR LOSS LEFT HINDLIMB
				11-03-10	7:11	2	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:11	2	HAIR LOSS LEFT FORELIMB
				11-03-10	7:11	1	HAIR LOSS LEFT HINDLIMB
				11-04-10	12:39	2	HAIR LOSS RIGHT FORELIMB
				11-04-10	12:39	2	HAIR LOSS LEFT FORELIMB
				11-04-10	12:39	2	HAIR LOSS LEFT HINDLIMB
81921	F	100 MG/KG	NORMAL	09-16-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921	F	100 MG/KG	DISPOSITION	11-05-10	11:40	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81921	F	100 MG/KG	BODY/INTEGUMENT	11-05-10	11:24	1	HAIR LOSS RIGHT FORELIMB
81926	F	100 MG/KG	NORMAL	09-16-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-05-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926	F	100 MG/KG	DISPOSITION	11-05-10	11:40	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81926	F	100 MG/KG	BODY/INTEGUMENT	11-03-10	7:11	1	HAIR LOSS LEFT FORELIMB
81926	F	100 MG/KG	EYES/EARS/NOSE	10-06-10	8:25	1	DRIED RED MATERIAL AROUND NOSE
81930	F	100 MG/KG	NORMAL	09-16-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81930	F	100 MG/KG	NORMAL	09-30-10	8:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930	F	100 MG/KG	DISPOSITION	11-01-10	13:58	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81930	F	100 MG/KG	BODY/INTEGUMENT	10-27-10	8:26	1	HAIR LOSS RIGHT FORELIMB
				11-01-10	13:47	2	HAIR LOSS RIGHT FORELIMB
				11-01-10	13:47	1	HAIR LOSS LEFT FORELIMB
81941	F	100 MG/KG	NORMAL	09-16-10	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941	F	100 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81941	F	100 MG/KG	BODY/INTEGUMENT	09-30-10	8:30	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:26	1	HAIR LOSS LEFT FORELIMB
				10-06-10	8:26	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:08	1	HAIR LOSS LEFT FORELIMB
				10-13-10	8:08	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:21	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:21	1	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				10-27-10	8:27	1	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
81960	F	100 MG/KG	NORMAL	09-16-10	8:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960	F	100 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81960	F	100 MG/KG	BODY/INTEGUMENT	10-06-10	8:27	1	HAIR LOSS RIGHT FORELIMB
				10-06-10	8:27	1	HAIR LOSS LEFT FORELIMB
				10-13-10	8:08	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	8:08	1	HAIR LOSS LEFT FORELIMB
				10-20-10	8:21	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	8:21	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81960	F	100 MG/KG	BODY/INTEGUMENT	10-27-10	8:28	1	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:28	1	HAIR LOSS LEFT FORELIMB
				11-02-10	12:26	1	HAIR LOSS RIGHT FORELIMB
				11-02-10	12:26	1	HAIR LOSS LEFT FORELIMB
81960	F	100 MG/KG	EYES/EARS/NOSE	09-30-10	8:31	1	DRIED RED MATERIAL AROUND NOSE
81961	F	100 MG/KG	NORMAL	09-16-10	8:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	12:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961	F	100 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81962	F	100 MG/KG	NORMAL	09-16-10	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962	F	100 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81962	F	100 MG/KG	EYES/EARS/NOSE	10-06-10	8:28	1	DRIED RED MATERIAL AROUND NOSE
81972	F	100 MG/KG	NORMAL	09-16-10	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81972	F	100 MG/KG	NORMAL	10-20-10	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972	F	100 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81978	F	100 MG/KG	NORMAL	09-16-10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81978	F	100 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81914	F	300 MG/KG	NORMAL	09-16-10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-10-10	8:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-13-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914	F	300 MG/KG	DISPOSITION	11-13-10	11:09	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81914	F	300 MG/KG	BODY/INTEGUMENT	10-13-10	8:28	1	DRIED YELLOW MATERIAL UROGENITAL AREA
81931	F	300 MG/KG	NORMAL	09-16-10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81931	F	300 MG/KG	NORMAL	10-20-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	12:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931	F	300 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81934	F	300 MG/KG	NORMAL	09-16-10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	12:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934	F	300 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81934	F	300 MG/KG	EYES/EARS/NOSE	10-13-10	8:10	1	DRIED RED MATERIAL AROUND NOSE
81943	F	300 MG/KG	NORMAL	09-16-10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943	F	300 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81943	F	300 MG/KG	BODY/INTEGUMENT	10-13-10	8:11	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:32	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:33	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
81943	F	300 MG/KG	EYES/EARS/NOSE	10-06-10	8:33	1	DRIED RED MATERIAL AROUND NOSE
81945	F	300 MG/KG	NORMAL	09-16-10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81945	F	300 MG/KG	NORMAL	10-06-10	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-10-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-14-10	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81945	F	300 MG/KG	DISPOSITION	11-14-10	10:42	P	SCHEDULED EUTHANASIA; POST-COHABITATION DAY 25
81945	F	300 MG/KG	SPECIAL II	10-20-10	7:20	P	BREEDING PERIOD COMPLETE; FEMALE SEPARATED FROM MALE AND PLACED INTO CLEAN CAGING
81946	F	300 MG/KG	NORMAL	09-16-10	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946	F	300 MG/KG	DISPOSITION	11-04-10	12:46	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81947	F	300 MG/KG	NORMAL	09-16-10	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-14-10	10:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81947	F	300 MG/KG	DISPOSITION	11-14-10	10:42	P	SCHEDULED EUTHANASIA; POST-COHABITATION DAY 25
81947	F	300 MG/KG	BODY/INTEGUMENT	10-13-10	8:29	2	DRIED YELLOW MATERIAL ANOGENITAL AREA
				10-20-10	7:23	2	DRIED YELLOW MATERIAL ANOGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81947	F	300 MG/KG	BODY/INTEGUMENT	10-27-10	8:50	1	DRIED YELLOW MATERIAL ANOGENITAL AREA
				11-10-10	8:12	1	DRIED YELLOW MATERIAL ANOGENITAL AREA
81947	F	300 MG/KG	SPECIAL II	10-20-10	7:21	P	BREEDING PERIOD COMPLETE; FEMALE SEPARATED FROM MALE AND PLACED INTO CLEAN CAGING
81957	F	300 MG/KG	NORMAL	09-16-10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957	F	300 MG/KG	DISPOSITION	11-06-10	12:14	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81957	F	300 MG/KG	BODY/INTEGUMENT	09-30-10	8:39	1	HAIR LOSS LEFT HINDLIMB
				10-06-10	8:35	1	HAIR LOSS RIGHT FORELIMB
				10-06-10	8:35	1	HAIR LOSS LEFT FORELIMB
				10-06-10	8:35	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:12	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	8:12	1	HAIR LOSS LEFT FORELIMB
				10-13-10	8:13	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:13	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:13	1	HAIR LOSS VENTRAL THORACIC AREA
				10-20-10	8:27	1	HAIR LOSS RIGHT FORELIMB
				10-20-10	8:27	1	HAIR LOSS LEFT FORELIMB
				10-20-10	8:27	1	HAIR LOSS VENTRAL THORACIC AREA
				10-20-10	8:27	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:27	1	HAIR LOSS LEFT HINDLIMB
				10-27-10	8:33	1	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:33	1	HAIR LOSS LEFT FORELIMB
				10-27-10	8:33	1	HAIR LOSS LEFT HINDLIMB
				11-03-10	7:15	1	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:15	1	HAIR LOSS LEFT FORELIMB
				11-03-10	7:15	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				11-03-10	7:15	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				11-06-10	12:14	1	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81957	F	300 MG/KG	BODY/INTEGUMENT	11-06-10	12:14	1	HAIR LOSS LEFT FORELIMB
81959	F	300 MG/KG	NORMAL	09-16-10	8:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959	F	300 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81959	F	300 MG/KG	BODY/INTEGUMENT	10-20-10	8:28	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:34	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:34	1	HAIR LOSS RIGHT HINDLIMB
				11-03-10	7:16	1	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:16	1	HAIR LOSS LEFT FORELIMB
81974	F	300 MG/KG	NORMAL	09-16-10	8:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81974	F	300 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81974	F	300 MG/KG	BODY/INTEGUMENT	09-30-10	8:41	2	HAIR LOSS RIGHT HINDLIMB
				10-06-10	8:35	2	HAIR LOSS RIGHT HINDLIMB
				10-06-10	8:35	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:14	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:14	2	HAIR LOSS RIGHT HINDLIMB
				10-20-10	8:28	2	HAIR LOSS RIGHT HINDLIMB
				10-20-10	8:28	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:29	1	HAIR LOSS DORSAL ABDOMINAL AREA
				10-27-10	8:34	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:35	1	HAIR LOSS DORSAL ABDOMINAL AREA
				10-27-10	8:35	1	HAIR LOSS RIGHT HINDLIMB
				10-27-10	8:35	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				11-03-10	7:17	1	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:17	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81974	F	300 MG/KG	BODY/INTEGUMENT	11-03-10	7:17	1	HAIR LOSS VENTRAL THORACIC AREA
				11-03-10	7:17	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-10	7:17	1	HAIR LOSS RIGHT HINDLIMB
				11-03-10	7:18	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
81976	F	300 MG/KG	NORMAL	09-16-10	8:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-06-10	12:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976	F	300 MG/KG	DISPOSITION	11-06-10	12:15	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81976	F	300 MG/KG	BODY/INTEGUMENT	10-13-10	8:14	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:30	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:36	1	HAIR LOSS VENTRAL ABDOMINAL AREA
81977	F	300 MG/KG	NORMAL	09-16-10	8:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-05-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977	F	300 MG/KG	DISPOSITION	11-05-10	11:40	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81977	F	300 MG/KG	EYES/EARS/NOSE	10-06-10	8:37	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-13-10	8:14	1	DRIED RED MATERIAL AROUND NOSE
81977	F	300 MG/KG	ORAL/DENTAL	10-06-10	8:37	P	TEETH LONG; TRIMMED
81918	F	900 MG/KG	DISPOSITION	11-05-10	11:40	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81918	F	900 MG/KG	BODY/INTEGUMENT	09-16-10	8:44	1	HAIR LOSS RIGHT FORELIMB
				09-16-10	8:44	1	HAIR LOSS LEFT FORELIMB
				09-23-10	8:30	1	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81918	F	900 MG/KG	BODY/INTEGUMENT	09-23-10	8:30	1	HAIR LOSS LEFT FORELIMB
				09-30-10	8:43	2	HAIR LOSS RIGHT FORELIMB
				09-30-10	8:43	2	HAIR LOSS LEFT FORELIMB
				09-30-10	8:44	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-30-10	8:44	1	HAIR LOSS LEFT HINDLIMB
				10-06-10	8:38	1	HAIR LOSS RIGHT FORELIMB
				10-06-10	8:38	1	HAIR LOSS LEFT FORELIMB
				10-06-10	8:38	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:16	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	8:16	1	HAIR LOSS LEFT FORELIMB
				10-13-10	8:16	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:30	2	HAIR LOSS RIGHT FORELIMB
				10-20-10	8:30	2	HAIR LOSS LEFT FORELIMB
				10-27-10	8:37	2	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:37	1	HAIR LOSS LEFT FORELIMB
				11-03-10	7:20	2	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:20	1	HAIR LOSS LEFT FORELIMB
				11-05-10	11:25	2	HAIR LOSS RIGHT FORELIMB
				11-05-10	11:25	2	HAIR LOSS LEFT FORELIMB
81918	F	900 MG/KG	EYES/EARS/NOSE	09-30-10	8:44	1	DRIED RED MATERIAL AROUND NOSE
81919	F	900 MG/KG	NORMAL	09-16-10	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919	F	900 MG/KG	DISPOSITION	11-05-10	11:40	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81919	F	900 MG/KG	BODY/INTEGUMENT	10-13-10	8:17	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-13-10	8:17	1	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA
				10-27-10	8:38	1	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81919	F	900 MG/KG	BODY/INTEGUMENT	10-27-10	8:38	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				11-03-10	7:20	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				11-03-10	7:20	1	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA
				11-05-10	11:26	1	HAIR LOSS VENTRAL ABDOMINAL AREA
81927	F	900 MG/KG	NORMAL	09-16-10	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-15-10	7:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927	F	900 MG/KG	DISPOSITION	11-15-10	9:58	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81927	F	900 MG/KG	BODY/INTEGUMENT	10-06-10	8:39	1	DRIED YELLOW MATERIAL ANOGENITAL AREA
				10-13-10	8:30	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:30	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:32	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:32	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:32	1	HAIR LOSS VENTRAL THORACIC AREA
				10-20-10	8:32	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-20-10	8:32	1	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA
				10-20-10	8:32	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:38	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-10	8:13	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-10-10	8:09	1	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				11-10-10	8:10	2	WET YELLOW MATERIAL UROGENITAL AREA
81927	F	900 MG/KG	EYES/EARS/NOSE	10-06-10	8:39	1	DRIED RED MATERIAL AROUND NOSE
				11-10-10	8:09	1	DRIED RED MATERIAL AROUND RIGHT EYE
81936	F	900 MG/KG	NORMAL	09-16-10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936	F	900 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81936	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:46	1	HAIR LOSS RIGHT HINDLIMB
				09-30-10	8:46	2	HAIR LOSS VENTRAL ABDOMINAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81936	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:47	1	HAIR LOSS LEFT HINDLIMB
				10-06-10	8:39	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:40	2	HAIR LOSS RIGHT HINDLIMB
				10-06-10	8:40	2	HAIR LOSS LEFT HINDLIMB
				10-06-10	8:41	2	HAIR LOSS UROGENITAL AREA
				10-06-10	8:41	P	SCABBING LEFT HINDLIMB
				10-13-10	8:17	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:17	3	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:17	3	HAIR LOSS RIGHT HINDLIMB
				10-13-10	8:18	2	HAIR LOSS UROGENITAL AREA
				10-20-10	8:33	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:33	2	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:33	2	HAIR LOSS RIGHT HINDLIMB
				10-27-10	8:39	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:39	2	HAIR LOSS RIGHT HINDLIMB
				10-27-10	8:39	2	HAIR LOSS LEFT HINDLIMB
				11-03-10	7:21	1	HAIR LOSS RIGHT HINDLIMB
				11-03-10	7:21	1	HAIR LOSS LEFT HINDLIMB
				11-03-10	7:21	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-10	12:38	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-10	12:38	2	HAIR LOSS RIGHT HINDLIMB
				11-04-10	12:38	2	HAIR LOSS LEFT HINDLIMB
81936	F	900 MG/KG	EYES/EARS/NOSE	09-30-10	8:46	1	DRIED RED MATERIAL AROUND NOSE
81937	F	900 MG/KG	NORMAL	09-16-10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81937	F	900 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81937	F	900 MG/KG	BODY/INTEGUMENT	10-06-10	8:42	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	8:18	2	DRIED YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81937	F	900 MG/KG	BODY/INTEGUMENT	10-13-10	8:19	1	HAIR LOSS VENTRAL THORACIC AREA
				10-13-10	8:19	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:34	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:34	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-20-10	8:34	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:40	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:40	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:40	1	HAIR LOSS VENTRAL THORACIC AREA
				11-03-10	7:22	1	HAIR LOSS VENTRAL THORACIC AREA
				11-03-10	7:23	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-10	12:40	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-10	12:40	1	HAIR LOSS VENTRAL THORACIC AREA
81951	F	900 MG/KG	NORMAL	09-16-10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81951	F	900 MG/KG	DISPOSITION	11-01-10	13:58	P	SCHEDULED EUTHANASIA; TOTAL LITTER LOSS
81951	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:48	2	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-30-10	8:49	2	DRIED YELLOW MATERIAL ANOGENITAL AREA
				10-06-10	8:42	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-06-10	8:43	1	HAIR LOSS VENTRAL THORACIC AREA
				10-06-10	8:43	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:19	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	8:35	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:40	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:40	1	HAIR LOSS VENTRAL ABDOMINAL AREA
81955	F	900 MG/KG	NORMAL	09-16-10	8:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955	F	900 MG/KG	DISPOSITION	11-02-10	12:35	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81955	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:50	1	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81955	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:50	1	HAIR LOSS LEFT FORELIMB
				09-30-10	8:50	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-30-10	8:50	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				09-30-10	8:50	1	HAIR LOSS LEFT HINDLIMB
				09-30-10	8:50	1	HAIR LOSS VENTRAL THORACIC AREA
				09-30-10	8:51	2	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA
				10-06-10	8:43	1	HAIR LOSS RIGHT FORELIMB
				10-06-10	8:43	1	HAIR LOSS LEFT FORELIMB
				10-06-10	8:43	1	HAIR LOSS VENTRAL THORACIC AREA
				10-06-10	8:43	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:44	2	HAIR LOSS RIGHT HINDLIMB
				10-06-10	8:44	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:20	1	HAIR LOSS RIGHT FORELIMB
				10-13-10	8:20	1	HAIR LOSS LEFT FORELIMB
				10-13-10	8:20	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:20	2	HAIR LOSS RIGHT HINDLIMB
				10-13-10	8:20	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:35	2	HAIR LOSS RIGHT HINDLIMB
				10-20-10	8:35	2	HAIR LOSS LEFT HINDLIMB
				10-27-10	8:41	1	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:41	1	HAIR LOSS LEFT FORELIMB
				10-27-10	8:41	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:41	2	HAIR LOSS RIGHT HINDLIMB
				10-27-10	8:41	2	HAIR LOSS LEFT HINDLIMB
				11-02-10	12:25	1	HAIR LOSS RIGHT FORELIMB
				11-02-10	12:25	1	HAIR LOSS LEFT FORELIMB
				11-02-10	12:25	1	HAIR LOSS RIGHT HINDLIMB
				11-02-10	12:25	1	HAIR LOSS LEFT HINDLIMB
81964	F	900 MG/KG	NORMAL	09-16-10	8:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81964	F	900 MG/KG	NORMAL	09-23-10	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81964	F	900 MG/KG	DISPOSITION	11-03-10	10:05	P	EUTHANIZED IN EXTREMIS
81964	F	900 MG/KG	BEHAVIOR/CNS	11-03-10	7:25	P	HUNCHED POSTURE
81964	F	900 MG/KG	BODY/INTEGUMENT	10-13-10	8:20	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-13-10	8:20	1	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA
				10-13-10	8:20	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	8:36	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:42	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				11-03-10	7:23	1	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				11-03-10	7:23	2	WET BROWN MATERIAL ANOGENITAL AREA
				11-03-10	7:23	2	WET YELLOW MATERIAL UROGENITAL AREA
				11-03-10	7:24	P	BODY COOL
81964	F	900 MG/KG	CARDIO-PULMONARY	11-03-10	7:24	P	RALES
81964	F	900 MG/KG	EYES/EARS/NOSE	11-03-10	7:24	P	EYELIDS SLIGHTLY DROOPING
				11-03-10	7:24	2	DRIED RED MATERIAL AROUND NOSE
81968	F	900 MG/KG	NORMAL	09-16-10	8:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81968	F	900 MG/KG	DISPOSITION	11-04-10	12:45	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81968	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:52	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				09-30-10	8:52	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-30-10	8:52	2	DRIED YELLOW MATERIAL ANOGENITAL AREA
				10-06-10	8:46	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:46	1	DRIED YELLOW MATERIAL ANOGENITAL AREA
				10-13-10	8:21	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	8:21	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:36	1	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA
				10-20-10	8:36	1	DRIED YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 23

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81968	F	900 MG/KG	BODY/INTEGUMENT	10-20-10	8:36	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:42	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:42	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-10	7:28	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-10	12:41	1	HAIR LOSS VENTRAL ABDOMINAL AREA
81968	F	900 MG/KG	EYES/EARS/NOSE	10-27-10	8:43	1	DRIED RED MATERIAL AROUND NOSE
81969	F	900 MG/KG	NORMAL	09-16-10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969	F	900 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81969	F	900 MG/KG	BODY/INTEGUMENT	10-06-10	8:47	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	8:22	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:22	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-20-10	8:37	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:37	1	DRIED YELLOW MATERIAL VENTRAL THORACIC AREA
				10-20-10	8:37	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-27-10	8:43	1	DRIED YELLOW MATERIAL UROGENITAL AREA
81969	F	900 MG/KG	EYES/EARS/NOSE	09-30-10	8:53	1	DRIED RED MATERIAL AROUND NOSE
81969	F	900 MG/KG	ORAL/DENTAL	09-30-10	8:53	2	DRIED CLEAR MATERIAL AROUND MOUTH
81973	F	900 MG/KG	NORMAL	09-16-10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973	F	900 MG/KG	DISPOSITION	11-03-10	12:39	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81973	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:54	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:48	1	HAIR LOSS VENTRAL THORACIC AREA
				10-06-10	8:48	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:48	1	HAIR LOSS RIGHT HINDLIMB
				10-06-10	8:48	1	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:22	1	HAIR LOSS VENTRAL THORACIC AREA
				10-13-10	8:22	1	HAIR LOSS VENTRAL ABDOMINAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81973	F	900 MG/KG	BODY/INTEGUMENT	10-13-10	8:22	1	HAIR LOSS RIGHT HINDLIMB
				10-13-10	8:22	1	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:38	1	HAIR LOSS RIGHT HINDLIMB
				10-20-10	8:38	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				10-20-10	8:38	1	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				10-27-10	8:43	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:43	1	HAIR LOSS VENTRAL THORACIC AREA
				10-27-10	8:44	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				10-27-10	8:44	1	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				11-03-10	7:30	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-10	7:30	1	HAIR LOSS RIGHT HINDLIMB
				11-03-10	7:30	1	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				11-03-10	7:30	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
81973	F	900 MG/KG	EYES/EARS/NOSE	10-13-10	8:22	1	DRIED RED MATERIAL AROUND NOSE
81973	F	900 MG/KG	ORAL/DENTAL	10-27-10	8:44	2	DRIED CLEAR MATERIAL AROUND MOUTH
81980	F	900 MG/KG	NORMAL	09-16-10	8:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980	F	900 MG/KG	DISPOSITION	11-06-10	12:15	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81980	F	900 MG/KG	BODY/INTEGUMENT	09-30-10	8:55	1	HAIR LOSS VENTRAL THORACIC AREA
				09-30-10	8:55	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				09-30-10	8:55	2	DRIED YELLOW MATERIAL ANOGENITAL AREA
				09-30-10	8:55	2	HAIR LOSS RIGHT HINDLIMB
				09-30-10	8:55	2	HAIR LOSS LEFT HINDLIMB
				10-06-10	8:49	2	HAIR LOSS VENTRAL THORACIC AREA
				10-06-10	8:49	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-06-10	8:49	2	HAIR LOSS RIGHT HINDLIMB
				10-06-10	8:49	2	HAIR LOSS LEFT HINDLIMB
				10-06-10	8:49	2	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				10-06-10	8:50	2	HAIR LOSS LEFT LATERAL ABDOMINAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 25

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81980	F	900 MG/KG	BODY/INTEGUMENT	10-13-10	8:23	2	HAIR LOSS VENTRAL THORACIC AREA
				10-13-10	8:23	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-13-10	8:23	3	HAIR LOSS RIGHT HINDLIMB
				10-13-10	8:23	3	HAIR LOSS LEFT HINDLIMB
				10-13-10	8:23	3	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				10-13-10	8:23	3	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				10-20-10	8:39	2	HAIR LOSS VENTRAL THORACIC AREA
				10-20-10	8:39	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-20-10	8:39	3	HAIR LOSS RIGHT HINDLIMB
				10-20-10	8:39	3	HAIR LOSS LEFT HINDLIMB
				10-20-10	8:39	2	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				10-20-10	8:39	2	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				10-27-10	8:44	2	HAIR LOSS VENTRAL THORACIC AREA
				10-27-10	8:44	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-27-10	8:44	3	HAIR LOSS RIGHT HINDLIMB
				10-27-10	8:44	3	HAIR LOSS LEFT HINDLIMB
				10-27-10	8:45	2	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				10-27-10	8:45	2	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				11-03-10	7:31	2	HAIR LOSS VENTRAL THORACIC AREA
				11-03-10	7:31	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-10	7:32	2	HAIR LOSS RIGHT HINDLIMB
				11-03-10	7:32	2	HAIR LOSS LEFT HINDLIMB
				11-03-10	7:32	2	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				11-03-10	7:32	2	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				11-06-10	12:15	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-10	12:15	1	HAIR LOSS VENTRAL THORACIC AREA
				11-06-10	12:15	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				11-06-10	12:15	1	HAIR LOSS LEFT LATERAL ABDOMINAL AREA
				11-06-10	12:15	1	HAIR LOSS RIGHT HINDLIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81980	F	900 MG/KG	BODY/INTEGUMENT	11-06-10	12:15	1	HAIR LOSS LEFT HINDLIMB
81928	F	60 MG/KG CYC	NORMAL	09-16-10	8:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928	F	60 MG/KG CYC	DISPOSITION	11-01-10	12:50	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81935	F	60 MG/KG CYC	NORMAL	09-16-10	8:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935	F	60 MG/KG CYC	DISPOSITION	11-03-10	12:16	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81935	F	60 MG/KG CYC	BODY/INTEGUMENT	11-03-10	7:33	1	HAIR LOSS RIGHT FORELIMB
				11-03-10	7:33	1	HAIR LOSS LEFT FORELIMB
81949	F	60 MG/KG CYC	NORMAL	09-16-10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949	F	60 MG/KG CYC	DISPOSITION	11-03-10	12:16	P	SCHEDULED EUTHANASIA; LACTATION DAY 4

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A2 (F0 FEMALES - DETAILED PHYSICAL EXAMINATIONS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-16-10 TO 11-15-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
81953	F	60 MG/KG CYC	NORMAL	09-16-10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953	F	60 MG/KG CYC	DISPOSITION	11-02-10	12:36	P	SCHEDULED EUTHANASIA; LACTATION DAY 4
81953	F	60 MG/KG CYC	BODY/INTEGUMENT	10-27-10	8:47	1	HAIR LOSS RIGHT FORELIMB
				10-27-10	8:47	1	HAIR LOSS LEFT FORELIMB
				11-02-10	12:24	2	HAIR LOSS RIGHT FORELIMB
				11-02-10	12:24	1	HAIR LOSS LEFT FORELIMB
81970	F	60 MG/KG CYC	NORMAL	09-16-10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-23-10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	8:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	8:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	8:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970	F	60 MG/KG CYC	DISPOSITION	11-02-10	12:36	P	SCHEDULED EUTHANASIA; LACTATION DAY 4

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A3 (F0 MALES - AT TIME OF DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82000	M	300 MG/KG	ORAL/DENTAL	10-12-10	10:22	1	SALIVATION PRIOR TO DOSING
				10-13-10	10:20	2	SALIVATION PRIOR TO DOSING
				10-15-10	10:22	1	SALIVATION PRIOR TO DOSING
				10-18-10	10:26	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:22	2	SALIVATION PRIOR TO DOSING
				10-20-10	10:23	1	SALIVATION PRIOR TO DOSING
82013	M	300 MG/KG	ORAL/DENTAL	09-27-10	10:18	2	SALIVATION PRIOR TO DOSING
82023	M	300 MG/KG	ORAL/DENTAL	10-19-10	10:24	1	SALIVATION PRIOR TO DOSING
82036	M	300 MG/KG	ORAL/DENTAL	10-13-10	10:23	1	SALIVATION PRIOR TO DOSING
				10-14-10	10:26	1	SALIVATION PRIOR TO DOSING
82044	M	300 MG/KG	ORAL/DENTAL	10-15-10	10:26	2	SALIVATION PRIOR TO DOSING
82006	M	900 MG/KG	ORAL/DENTAL	10-15-10	10:41	2	SALIVATION PRIOR TO DOSING
82009	M	900 MG/KG	ORAL/DENTAL	09-29-10	10:38	1	SALIVATION PRIOR TO DOSING
				09-30-10	10:54	2	SALIVATION PRIOR TO DOSING
				10-04-10	10:42	2	SALIVATION PRIOR TO DOSING
				10-06-10	10:34	1	SALIVATION PRIOR TO DOSING
				10-07-10	10:48	1	SALIVATION PRIOR TO DOSING
				10-12-10	10:39	3	SALIVATION PRIOR TO DOSING
				10-13-10	10:38	1	SALIVATION PRIOR TO DOSING
				10-14-10	10:41	1	SALIVATION PRIOR TO DOSING
				10-15-10	10:42	3	SALIVATION PRIOR TO DOSING
82010	M	900 MG/KG	ORAL/DENTAL	10-10-10	10:39	1	SALIVATION PRIOR TO DOSING
				10-15-10	10:42	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:42	2	SALIVATION PRIOR TO DOSING
82028	M	900 MG/KG	ORAL/DENTAL	10-07-10	10:50	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:43	3	SALIVATION PRIOR TO DOSING
82035	M	900 MG/KG	ORAL/DENTAL	10-14-10	10:44	2	SALIVATION PRIOR TO DOSING
82040	M	900 MG/KG	ORAL/DENTAL	09-27-10	10:38	2	SALIVATION PRIOR TO DOSING
				10-05-10	10:37	3	SALIVATION PRIOR TO DOSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A3 (F0 MALES - AT TIME OF DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
82040	M	900 MG/KG	ORAL/DENTAL	10-15-10	10:46	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:46	1	SALIVATION PRIOR TO DOSING
82042	M	900 MG/KG	ORAL/DENTAL	10-02-10	10:42	3	SALIVATION PRIOR TO DOSING
82043	M	900 MG/KG	ORAL/DENTAL	10-08-10	10:42	2	SALIVATION PRIOR TO DOSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A4 (F0 FEMALES - AT TIME OF DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				AT TIME OF DOSING			
81920	F	0 MG/KG	ORAL/DENTAL	10-21-10	10:01	1	SALIVATION PRIOR TO DOSING
81939	F	0 MG/KG	ORAL/DENTAL	10-15-10	10:04	2	SALIVATION PRIOR TO DOSING
81950	F	0 MG/KG	ORAL/DENTAL	10-05-10	10:01	3	SALIVATION PRIOR TO DOSING
				10-12-10	10:07	2	SALIVATION PRIOR TO DOSING
				10-14-10	10:08	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:04	3	SALIVATION PRIOR TO DOSING
				10-21-10	10:03	2	SALIVATION PRIOR TO DOSING
				10-24-10	10:02	2	SALIVATION PRIOR TO DOSING
				10-27-10	10:01	2	SALIVATION PRIOR TO DOSING
81914	F	300 MG/KG	ORAL/DENTAL	10-07-10	10:35	1	SALIVATION PRIOR TO DOSING
				10-19-10	10:28	2	SALIVATION PRIOR TO DOSING
				10-20-10	10:28	1	SALIVATION PRIOR TO DOSING
81931	F	300 MG/KG	ORAL/DENTAL	10-19-10	10:29	2	SALIVATION PRIOR TO DOSING
				10-22-10	10:11	2	SALIVATION PRIOR TO DOSING
81934	F	300 MG/KG	ORAL/DENTAL	10-07-10	10:35	1	SALIVATION PRIOR TO DOSING
81943	F	300 MG/KG	ORAL/DENTAL	10-20-10	10:29	2	SALIVATION PRIOR TO DOSING
81945	F	300 MG/KG	ORAL/DENTAL	09-29-10	10:28	1	SALIVATION PRIOR TO DOSING
				10-10-10	10:32	1	SALIVATION PRIOR TO DOSING
				10-11-10	10:24	3	SALIVATION PRIOR TO DOSING
				10-12-10	10:27	3	SALIVATION PRIOR TO DOSING
				10-14-10	10:29	3	SALIVATION PRIOR TO DOSING
				10-15-10	10:28	3	SALIVATION PRIOR TO DOSING
				10-16-10	11:12	2	SALIVATION PRIOR TO DOSING
				10-17-10	11:13	2	SALIVATION PRIOR TO DOSING
				10-18-10	10:32	3	SALIVATION PRIOR TO DOSING
				10-19-10	10:27	3	SALIVATION PRIOR TO DOSING
				10-25-10	10:15	2	SALIVATION PRIOR TO DOSING
81946	F	300 MG/KG	ORAL/DENTAL	09-24-10	10:31	2	SALIVATION PRIOR TO DOSING
81947	F	300 MG/KG	ORAL/DENTAL	10-12-10	10:28	2	SALIVATION PRIOR TO DOSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A4 (F0 FEMALES - AT TIME OF DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				AT TIME OF DOSING			
81947	F	300 MG/KG	ORAL/DENTAL	10-18-10	10:32	2	SALIVATION PRIOR TO DOSING
81957	F	300 MG/KG	ORAL/DENTAL	10-23-10	10:12	2	SALIVATION PRIOR TO DOSING
81959	F	300 MG/KG	ORAL/DENTAL	10-11-10	10:27	1	SALIVATION PRIOR TO DOSING
				10-15-10	10:31	1	SALIVATION PRIOR TO DOSING
81974	F	300 MG/KG	ORAL/DENTAL	10-18-10	10:35	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:32	2	SALIVATION PRIOR TO DOSING
				10-23-10	10:13	2	SALIVATION PRIOR TO DOSING
				10-24-10	10:16	2	SALIVATION PRIOR TO DOSING
				11-01-10	10:23	2	SALIVATION PRIOR TO DOSING
81976	F	300 MG/KG	ORAL/DENTAL	10-15-10	10:32	2	SALIVATION PRIOR TO DOSING
				10-18-10	10:36	3	SALIVATION PRIOR TO DOSING
				10-19-10	10:33	3	SALIVATION PRIOR TO DOSING
				10-21-10	10:24	2	SALIVATION PRIOR TO DOSING
				10-22-10	10:15	2	SALIVATION PRIOR TO DOSING
				10-23-10	10:14	3	SALIVATION PRIOR TO DOSING
				10-25-10	10:17	1	SALIVATION PRIOR TO DOSING
				10-29-10	10:12	2	SALIVATION PRIOR TO DOSING
81977	F	300 MG/KG	ORAL/DENTAL	10-29-10	10:13	2	SALIVATION PRIOR TO DOSING
81918	F	900 MG/KG	ORAL/DENTAL	10-06-10	10:28	1	SALIVATION PRIOR TO DOSING
				10-18-10	10:38	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:35	1	SALIVATION PRIOR TO DOSING
				10-26-10	10:21	2	SALIVATION PRIOR TO DOSING
				10-27-10	10:16	1	SALIVATION PRIOR TO DOSING
				10-28-10	10:13	2	SALIVATION PRIOR TO DOSING
				10-29-10	10:14	1	SALIVATION PRIOR TO DOSING
				11-04-10	10:01	1	SALIVATION PRIOR TO DOSING
81919	F	900 MG/KG	ORAL/DENTAL	10-23-10	10:17	1	SALIVATION PRIOR TO DOSING
81927	F	900 MG/KG	ORAL/DENTAL	11-09-10	10:27	1	SALIVATION PRIOR TO DOSING
81936	F	900 MG/KG	ORAL/DENTAL	10-03-10	10:25	2	SALIVATION PRIOR TO DOSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				AT TIME OF DOSING			
81936	F	900 MG/KG	ORAL/DENTAL	10-13-10	10:32	1	SALIVATION PRIOR TO DOSING
				10-14-10	10:35	3	SALIVATION PRIOR TO DOSING
				10-15-10	10:34	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:36	3	SALIVATION PRIOR TO DOSING
				10-20-10	10:35	3	SALIVATION PRIOR TO DOSING
				10-21-10	10:27	2	SALIVATION PRIOR TO DOSING
				10-24-10	10:19	2	SALIVATION PRIOR TO DOSING
				10-25-10	10:21	2	SALIVATION PRIOR TO DOSING
				10-26-10	10:22	2	SALIVATION PRIOR TO DOSING
				10-28-10	10:15	2	SALIVATION PRIOR TO DOSING
				11-02-10	10:33	3	SALIVATION PRIOR TO DOSING
81951	F	900 MG/KG	ORAL/DENTAL	10-11-10	10:32	2	SALIVATION PRIOR TO DOSING
				10-12-10	10:35	3	SALIVATION PRIOR TO DOSING
				10-13-10	10:33	2	SALIVATION PRIOR TO DOSING
				10-14-10	10:36	2	SALIVATION PRIOR TO DOSING
				10-15-10	10:35	3	SALIVATION PRIOR TO DOSING
				10-16-10	11:21	2	SALIVATION PRIOR TO DOSING
				10-17-10	11:23	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:37	3	SALIVATION PRIOR TO DOSING
				10-22-10	10:19	3	SALIVATION PRIOR TO DOSING
				10-23-10	10:18	3	SALIVATION PRIOR TO DOSING
				10-24-10	10:20	3	SALIVATION PRIOR TO DOSING
				10-25-10	10:21	3	SALIVATION PRIOR TO DOSING
				10-26-10	10:23	3	SALIVATION PRIOR TO DOSING
				10-27-10	10:18	3	SALIVATION PRIOR TO DOSING
				10-28-10	10:16	2	SALIVATION PRIOR TO DOSING
				10-30-10	10:25	1	SALIVATION PRIOR TO DOSING
81955	F	900 MG/KG	ORAL/DENTAL	10-11-10	10:32	1	SALIVATION PRIOR TO DOSING
				10-12-10	10:35	2	SALIVATION PRIOR TO DOSING

TABLE A4 (F0 FEMALES - AT TIME OF DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				AT TIME OF DOSING			
81955	F	900 MG/KG	ORAL/DENTAL	10-13-10	10:34	3	SALIVATION PRIOR TO DOSING
				10-15-10	10:36	3	SALIVATION PRIOR TO DOSING
				10-19-10	10:37	3	SALIVATION PRIOR TO DOSING
				10-25-10	10:22	3	SALIVATION PRIOR TO DOSING
81964	F	900 MG/KG	ORAL/DENTAL	09-27-10	10:31	2	SALIVATION PRIOR TO DOSING
				09-28-10	10:32	2	SALIVATION PRIOR TO DOSING
				09-29-10	10:35	2	SALIVATION PRIOR TO DOSING
				10-03-10	10:27	2	SALIVATION PRIOR TO DOSING
				10-04-10	10:40	2	SALIVATION PRIOR TO DOSING
				10-05-10	10:30	3	SALIVATION PRIOR TO DOSING
				10-14-10	10:37	1	SALIVATION PRIOR TO DOSING
				10-15-10	10:37	3	SALIVATION PRIOR TO DOSING
				10-20-10	10:37	2	SALIVATION PRIOR TO DOSING
81968	F	900 MG/KG	ORAL/DENTAL	10-18-10	10:41	2	SALIVATION PRIOR TO DOSING
				10-19-10	10:38	2	SALIVATION PRIOR TO DOSING
				10-26-10	10:24	2	SALIVATION PRIOR TO DOSING
81969	F	900 MG/KG	ORAL/DENTAL	10-03-10	10:27	2	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	10:31	2	SALIVATION PRIOR TO DOSING
				10-13-10	10:35	2	SALIVATION PRIOR TO DOSING
				10-14-10	10:38	1	SALIVATION PRIOR TO DOSING
				10-15-10	10:38	3	SALIVATION PRIOR TO DOSING
				10-17-10	11:25	2	SALIVATION PRIOR TO DOSING
81973	F	900 MG/KG	ORAL/DENTAL	09-27-10	10:33	3	SALIVATION PRIOR TO DOSING
				09-28-10	10:34	3	SALIVATION PRIOR TO DOSING
				09-29-10	10:36	1	SALIVATION PRIOR TO DOSING
				09-30-10	10:52	2	SALIVATION PRIOR TO DOSING
				10-05-10	10:32	3	SALIVATION PRIOR TO DOSING
				10-06-10	10:32	3	SALIVATION PRIOR TO DOSING
				10-11-10	10:34	2	SALIVATION PRIOR TO DOSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				AT TIME OF DOSING			
81973	F	900 MG/KG	ORAL/DENTAL	10-13-10	10:35	3	SALIVATION PRIOR TO DOSING
				10-14-10	10:39	3	SALIVATION PRIOR TO DOSING
				10-15-10	10:39	3	SALIVATION PRIOR TO DOSING
				10-16-10	11:24	3	SALIVATION PRIOR TO DOSING
				10-17-10	11:26	2	SALIVATION PRIOR TO DOSING
				10-18-10	10:42	3	SALIVATION PRIOR TO DOSING
				10-20-10	10:38	2	SALIVATION PRIOR TO DOSING
				10-21-10	10:31	1	SALIVATION PRIOR TO DOSING
				10-22-10	10:21	2	SALIVATION PRIOR TO DOSING
				10-23-10	10:21	1	SALIVATION PRIOR TO DOSING
				10-25-10	10:24	1	SALIVATION PRIOR TO DOSING
				10-27-10	10:21	2	SALIVATION PRIOR TO DOSING
				10-30-10	10:28	1	SALIVATION PRIOR TO DOSING
				11-01-10	10:29	3	SALIVATION PRIOR TO DOSING
				11-02-10	10:35	2	SALIVATION PRIOR TO DOSING
81980	F	900 MG/KG	ORAL/DENTAL	10-13-10	10:36	1	SALIVATION PRIOR TO DOSING
				10-15-10	10:39	2	SALIVATION PRIOR TO DOSING
				10-18-10	10:42	2	SALIVATION PRIOR TO DOSING
				10-23-10	10:21	2	SALIVATION PRIOR TO DOSING
				11-01-10	10:29	3	SALIVATION PRIOR TO DOSING
				11-04-10	10:02	2	SALIVATION PRIOR TO DOSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81988	M	0 MG/KG	NORMAL	09-23-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81989	M	0 MG/KG	NORMAL	09-23-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81991	M	0 MG/KG	NORMAL	09-23-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81996	M	0 MG/KG	NORMAL	09-23-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81996	M	0 MG/KG	ORAL/DENTAL	10-07-10	11:00	1	WET CLEAR MATERIAL AROUND MOUTH
81997	M	0 MG/KG	NORMAL	09-23-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81997	M	0 MG/KG	NORMAL	09-24-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81998	M	0 MG/KG	NORMAL	09-23-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81998	M	0 MG/KG	NORMAL	09-25-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81998	M	0 MG/KG	ORAL/DENTAL	10-19-10	10:51	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	10:50	2	DRIED CLEAR MATERIAL AROUND MOUTH
82014	M	0 MG/KG	NORMAL	09-23-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82014	M	0 MG/KG	NORMAL	09-26-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82020	M	0 MG/KG	NORMAL	09-23-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82020	M	0 MG/KG	NORMAL	09-26-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82021	M	0 MG/KG	NORMAL	09-23-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82021	M	0 MG/KG	NORMAL	09-27-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82025	M	0 MG/KG	NORMAL	09-23-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82025	M	0 MG/KG	NORMAL	09-27-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82038	M	0 MG/KG	NORMAL	09-23-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82038	M	0 MG/KG	NORMAL	09-28-10	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82038	M	0 MG/KG	EYES/EARS/NOSE	10-15-10	10:54	1	DRIED RED MATERIAL AROUND NOSE
82041	M	0 MG/KG	NORMAL	09-23-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82041	M	0 MG/KG	NORMAL	09-29-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81982	M	100 MG/KG	NORMAL	09-24-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81982	M	100 MG/KG	NORMAL	09-30-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81982	M	100 MG/KG	ORAL/DENTAL	09-23-10	11:30	1	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:13	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
81987	M	100 MG/KG	NORMAL	09-23-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81987	M	100 MG/KG	NORMAL	09-30-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81987	M	100 MG/KG	ORAL/DENTAL	09-24-10	11:25	2	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:00	1	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:15	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:18	3	WET CLEAR MATERIAL AROUND MOUTH
81994	M	100 MG/KG	NORMAL	09-23-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81994	M	100 MG/KG	NORMAL	09-29-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82001	M	100 MG/KG	NORMAL	09-23-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82001	M	100 MG/KG	NORMAL	10-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82001	M	100 MG/KG	ORAL/DENTAL	09-29-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:00	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
82003	M	100 MG/KG	NORMAL	09-23-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82003	M	100 MG/KG	NORMAL	10-03-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82003	M	100 MG/KG	ORAL/DENTAL	09-29-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	10:59	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:00	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:08	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:13	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
82007	M	100 MG/KG	NORMAL	09-23-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82007	M	100 MG/KG	NORMAL	10-02-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82007	M	100 MG/KG	ORAL/DENTAL	09-29-10	11:13	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:01	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:01	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:08	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:01	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:01	1	DRIED RED MATERIAL AROUND MOUTH
82011	M	100 MG/KG	NORMAL	09-23-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82011	M	100 MG/KG	NORMAL	09-30-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82011	M	100 MG/KG	BODY/INTEGUMENT	09-29-10	11:14	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:14	1	WET CLEAR MATERIAL LEFT FORELIMB
82011	M	100 MG/KG	ORAL/DENTAL	09-29-10	11:13	2	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
82016	M	100 MG/KG	NORMAL	09-23-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82016	M	100 MG/KG	NORMAL	09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82022	M	100 MG/KG	NORMAL	09-23-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82022	M	100 MG/KG	NORMAL	09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82022	M	100 MG/KG	ORAL/DENTAL	10-01-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:02	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
82024	M	100 MG/KG	NORMAL	09-23-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82024	M	100 MG/KG	NORMAL	09-29-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82024	M	100 MG/KG	EYES/EARS/NOSE	10-17-10	11:46	2	WET RED MATERIAL AROUND NOSE
82024	M	100 MG/KG	ORAL/DENTAL	10-01-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:01	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:19	1	WET CLEAR MATERIAL AROUND MOUTH
82034	M	100 MG/KG	NORMAL	09-23-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82034	M	100 MG/KG	NORMAL	09-29-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82046	M	100 MG/KG	NORMAL	09-23-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82046	M	100 MG/KG	NORMAL	09-29-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82046	M	100 MG/KG	EYES/EARS/NOSE	10-12-10	11:13	1	DRIED RED MATERIAL AROUND NOSE
81993	M	300 MG/KG	NORMAL	09-23-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81993	M	300 MG/KG	NORMAL	10-02-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81993	M	300 MG/KG	BODY/INTEGUMENT	10-01-10	11:19	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-01-10	11:19	1	WET CLEAR MATERIAL LEFT FORELIMB
81993	M	300 MG/KG	ORAL/DENTAL	09-29-10	11:15	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:19	2	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:21	2	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:15	1	DRIED CLEAR MATERIAL AROUND MOUTH
81995	M	300 MG/KG	NORMAL	09-23-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81995	M	300 MG/KG	NORMAL	10-02-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81995	M	300 MG/KG	BODY/INTEGUMENT	10-07-10	11:21	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-07-10	11:22	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-08-10	11:25	1	WET YELLOW MATERIAL UROGENITAL AREA
81995	M	300 MG/KG	ORAL/DENTAL	09-27-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:13	2	WET CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:16	3	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:21	3	WET CLEAR MATERIAL AROUND MOUTH
82000	M	300 MG/KG	NORMAL	09-23-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82000	M	300 MG/KG	NORMAL	09-28-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82000	M	300 MG/KG	ORAL/DENTAL	09-29-10	11:16	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:20	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:02	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
82002	M	300 MG/KG	NORMAL	09-23-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82002	M	300 MG/KG	NORMAL	09-28-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82002	M	300 MG/KG	ORAL/DENTAL	09-29-10	11:16	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:02	2	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:04	1	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:15	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
82005	M	300 MG/KG	NORMAL	09-23-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82005	M	300 MG/KG	NORMAL	10-04-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82005	M	300 MG/KG	BODY/INTEGUMENT	10-08-10	11:26	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:05	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:16	1	DRIED YELLOW MATERIAL UROGENITAL AREA
82005	M	300 MG/KG	ORAL/DENTAL	09-26-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:16	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:20	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:16	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
82013	M	300 MG/KG	NORMAL	09-23-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82013	M	300 MG/KG	NORMAL	09-27-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82013	M	300 MG/KG	ORAL/DENTAL	10-01-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
82015	M	300 MG/KG	NORMAL	09-23-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82015	M	300 MG/KG	NORMAL	09-28-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82015	M	300 MG/KG	BODY/INTEGUMENT	10-07-10	11:24	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:26	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:17	1	DRIED YELLOW MATERIAL UROGENITAL AREA
82015	M	300 MG/KG	ORAL/DENTAL	10-19-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
82023	M	300 MG/KG	NORMAL	09-23-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82023	M	300 MG/KG	NORMAL	09-28-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82023	M	300 MG/KG	BODY/INTEGUMENT	10-08-10	11:26	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-10-10	11:19	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:06	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:17	2	DRIED YELLOW MATERIAL UROGENITAL AREA
82023	M	300 MG/KG	ORAL/DENTAL	10-06-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
82031	M	300 MG/KG	NORMAL	09-23-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82031	M	300 MG/KG	NORMAL	09-30-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82031	M	300 MG/KG	ORAL/DENTAL	09-29-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:19	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:06	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:12	1	WET CLEAR MATERIAL AROUND MOUTH
82036	M	300 MG/KG	NORMAL	09-23-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82036	M	300 MG/KG	NORMAL	10-01-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82036	M	300 MG/KG	BODY/INTEGUMENT	10-19-10	11:15	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-19-10	11:15	2	WET CLEAR MATERIAL LEFT FORELIMB
82036	M	300 MG/KG	EYES/EARS/NOSE	10-19-10	11:15	2	WET CLEAR MATERIAL AROUND NOSE
82036	M	300 MG/KG	ORAL/DENTAL	09-28-10	11:15	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:15	3	WET CLEAR MATERIAL AROUND MOUTH
82039	M	300 MG/KG	NORMAL	09-23-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82039	M	300 MG/KG	NORMAL	09-27-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82039	M	300 MG/KG	BODY/INTEGUMENT	10-08-10	11:27	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:23	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:23	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-15-10	11:23	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-19-10	11:16	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-19-10	11:16	1	WET CLEAR MATERIAL LEFT FORELIMB
82039	M	300 MG/KG	EYES/EARS/NOSE	10-19-10	11:16	1	WET CLEAR MATERIAL AROUND NOSE
82039	M	300 MG/KG	ORAL/DENTAL	09-29-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:20	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82039	M	300 MG/KG	ORAL/DENTAL	10-15-10	11:23	3	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:16	2	WET CLEAR MATERIAL AROUND MOUTH
82044	M	300 MG/KG	NORMAL	09-23-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82044	M	300 MG/KG	BODY/INTEGUMENT	10-08-10	11:27	1	WET YELLOW MATERIAL UROGENITAL AREA
82044	M	300 MG/KG	ORAL/DENTAL	10-08-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
82006	M	900 MG/KG	NORMAL	09-23-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82006	M	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:55	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-28-10	11:33	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-02-10	11:32	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:43	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-13-10	11:23	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-14-10	11:32	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:34	3	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:34	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-15-10	11:34	2	WET CLEAR MATERIAL LEFT FORELIMB
				10-18-10	11:35	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-20-10	11:31	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-20-10	11:31	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-20-10	11:31	2	WET CLEAR MATERIAL LEFT FORELIMB
82006	M	900 MG/KG	EYES/EARS/NOSE	10-20-10	11:31	1	WET CLEAR MATERIAL AROUND NOSE
82006	M	900 MG/KG	EXCRETA	09-24-10	11:56	P	SOFT STOOL
				09-25-10	11:54	P	SOFT STOOL
82006	M	900 MG/KG	ORAL/DENTAL	09-28-10	11:33	2	WET CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:38	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:44	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:37	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:31	1	WET RED MATERIAL AROUND MOUTH
				10-03-10	11:24	1	WET RED MATERIAL AROUND MOUTH
				10-04-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82006	M	900 MG/KG	ORAL/DENTAL	10-06-10	11:39	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:43	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:41	2	WET CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:33	1	DRIED RED MATERIAL AROUND MOUTH
				10-11-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:33	3	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:23	2	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:34	3	WET CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:16	2	WET CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:28	3	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:35	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:35	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:31	3	WET CLEAR MATERIAL AROUND MOUTH
82009	M	900 MG/KG	NORMAL	09-23-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82009	M	900 MG/KG	BODY/INTEGUMENT	09-26-10	11:36	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-27-10	11:35	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:38	2	WET YELLOW MATERIAL UROGENITAL AREA
				09-30-10	11:45	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:38	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-02-10	11:32	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-04-10	11:34	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-05-10	11:27	1	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82009	M	900 MG/KG	BODY/INTEGUMENT	10-06-10	11:39	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-07-10	11:40	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:44	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:26	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:34	2	DRIED YELLOW MATERIAL UROGENITAL AREA
82009	M	900 MG/KG	ORAL/DENTAL	09-25-10	11:55	2	WET CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:35	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:38	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:44	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:32	1	WET RED MATERIAL AROUND MOUTH
				10-03-10	11:24	1	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:39	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:42	1	WET CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:32	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:34	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:32	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:32	1	DRIED RED MATERIAL AROUND MOUTH
				10-21-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
82010	M	900 MG/KG	NORMAL	09-23-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82010	M	900 MG/KG	NORMAL	09-26-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82010	M	900 MG/KG	BEHAVIOR/CNS	09-29-10	11:39	P	HUNCHED POSTURE
				10-02-10	11:33	P	HUNCHED POSTURE
82010	M	900 MG/KG	BODY/INTEGUMENT	09-28-10	11:35	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:38	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:39	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:39	1	WET CLEAR MATERIAL LEFT FORELIMB
				09-30-10	11:45	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:38	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-02-10	11:33	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-07-10	11:41	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:44	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:35	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:35	1	WET YELLOW MATERIAL UROGENITAL AREA
82010	M	900 MG/KG	EYES/EARS/NOSE	10-20-10	11:32	2	WET CLEAR MATERIAL AROUND NOSE
82010	M	900 MG/KG	ORAL/DENTAL	09-28-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:38	3	WET CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:45	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:33	2	WET RED MATERIAL AROUND MOUTH
				10-03-10	11:25	2	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:35	2	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:27	2	WET CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:39	2	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:41	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:44	2	WET CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:42	2	WET CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:34	2	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82010	M	900 MG/KG	ORAL/DENTAL	10-11-10	11:26	2	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:35	2	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:24	2	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:33	2	WET CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:35	2	WET CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:16	2	WET CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:28	3	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:36	2	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:37	2	WET CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:32	3	WET CLEAR MATERIAL AROUND MOUTH
82018	M	900 MG/KG	NORMAL	09-23-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82018	M	900 MG/KG	BEHAVIOR/CNS	10-03-10	11:26	P	HUNCHED POSTURE
82018	M	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:56	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:39	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:36	1	WET YELLOW MATERIAL UROGENITAL AREA
82018	M	900 MG/KG	EYES/EARS/NOSE	10-12-10	11:36	1	DRIED RED MATERIAL AROUND NOSE
82018	M	900 MG/KG	ORAL/DENTAL	09-24-10	11:57	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-25-10	11:56	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-26-10	11:37	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:35	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:39	2	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:39	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:26	1	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82018	M	900 MG/KG	ORAL/DENTAL	10-04-10	11:35	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:40	1	DRIED RED MATERIAL AROUND MOUTH
				10-07-10	11:41	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:45	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:34	1	DRIED RED MATERIAL AROUND MOUTH
				10-11-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:27	1	DRIED RED MATERIAL AROUND MOUTH
				10-12-10	11:35	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:35	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:29	1	DRIED RED MATERIAL AROUND MOUTH
				10-18-10	11:37	1	DRIED CLEAR MATERIAL AROUND MOUTH
82028	M	900 MG/KG	NORMAL	09-23-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82028	M	900 MG/KG	BEHAVIOR/CNS	09-29-10	11:40	P	HUNCHED POSTURE
				10-01-10	11:39	P	HUNCHED POSTURE
				10-02-10	11:34	P	HUNCHED POSTURE
				10-03-10	11:26	P	HUNCHED POSTURE
				10-04-10	11:36	P	HUNCHED POSTURE
				10-06-10	11:40	P	HUNCHED POSTURE
				10-14-10	11:34	P	HUNCHED POSTURE
				10-19-10	11:38	P	HUNCHED POSTURE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82028	M	900 MG/KG	BODY/INTEGUMENT	09-29-10	11:40	2	WET YELLOW MATERIAL UROGENITAL AREA
				09-30-10	11:46	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:39	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:39	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-01-10	11:39	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-02-10	11:34	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-02-10	11:34	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-05-10	11:28	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:46	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:36	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-14-10	11:33	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:36	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-18-10	11:37	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-19-10	11:37	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-20-10	11:33	1	WET YELLOW MATERIAL UROGENITAL AREA
82028	M	900 MG/KG	ORAL/DENTAL	09-25-10	11:57	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:40	3	WET CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:46	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:39	2	WET CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:34	3	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:36	3	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:28	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:40	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:42	2	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:45	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:27	2	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82028	M	900 MG/KG	ORAL/DENTAL	10-12-10	11:36	2	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:33	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:36	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:17	3	WET CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:37	2	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:37	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:33	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
82029	M	900 MG/KG	NORMAL	09-23-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82029	M	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:58	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-26-10	11:38	2	WET YELLOW MATERIAL UROGENITAL AREA
				09-27-10	11:37	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-30-10	11:47	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:40	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-03-10	11:26	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-04-10	11:36	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-05-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-06-10	11:41	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-07-10	11:42	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:36	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:37	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-15-10	11:37	2	WET CLEAR MATERIAL LEFT FORELIMB
				10-18-10	11:37	1	WET YELLOW MATERIAL UROGENITAL AREA
82029	M	900 MG/KG	EYES/EARS/NOSE	10-15-10	11:38	2	WET CLEAR MATERIAL AROUND NOSE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82029	M	900 MG/KG	ORAL/DENTAL	09-24-10	11:58	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:37	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:37	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:47	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:40	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:36	2	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:41	2	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:42	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:46	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:43	1	WET RED MATERIAL AROUND MOUTH
				10-10-10	11:34	2	WET CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:28	2	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:37	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:25	1	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:34	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:36	3	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:37	2	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:34	2	DRIED CLEAR MATERIAL AROUND MOUTH
82030	M	900 MG/KG	NORMAL	09-23-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82030	M	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:59	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:41	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-30-10	11:47	1	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82030	M	900 MG/KG	BODY/INTEGUMENT	10-01-10	11:40	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:40	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-01-10	11:41	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-04-10	11:37	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-05-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:46	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:37	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	11:26	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-14-10	11:36	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:38	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-20-10	11:34	1	WET YELLOW MATERIAL UROGENITAL AREA
82030	M	900 MG/KG	EYES/EARS/NOSE	10-02-10	11:35	1	WET RED MATERIAL AROUND NOSE
82030	M	900 MG/KG	ORAL/DENTAL	09-24-10	11:58	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-25-10	11:59	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-26-10	11:39	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:37	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:37	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:47	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:41	1	WET RED MATERIAL AROUND MOUTH
				10-01-10	11:41	2	WET CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:35	1	WET RED MATERIAL AROUND MOUTH
				10-03-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:37	1	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:43	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:46	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82030	M	900 MG/KG	ORAL/DENTAL	10-09-10	11:44	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:35	1	WET RED MATERIAL AROUND MOUTH
				10-11-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:29	1	DRIED RED MATERIAL AROUND MOUTH
				10-12-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:35	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:36	2	DRIED RED MATERIAL AROUND MOUTH
				10-15-10	11:38	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:38	1	DRIED RED MATERIAL AROUND MOUTH
				10-20-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
82035	M	900 MG/KG	NORMAL	09-23-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82035	M	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:59	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-26-10	11:39	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:42	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:43	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:43	1	WET CLEAR MATERIAL LEFT FORELIMB
				09-30-10	11:48	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-30-10	11:48	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-30-10	11:48	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-01-10	11:42	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:42	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-01-10	11:42	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-02-10	11:36	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-02-10	11:36	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-04-10	11:37	1	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82035	M	900 MG/KG	BODY/INTEGUMENT	10-07-10	11:43	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-07-10	11:44	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-07-10	11:44	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-08-10	11:47	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:38	1	DRIED YELLOW MATERIAL UROGENITAL AREA
82035	M	900 MG/KG	EYES/EARS/NOSE	09-29-10	11:43	2	WET RED MATERIAL AROUND NOSE
82035	M	900 MG/KG	ORAL/DENTAL	09-24-10	11:58	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:38	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:42	3	WET CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:43	2	WET RED MATERIAL AROUND MOUTH
				09-30-10	11:48	2	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:42	2	WET CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:36	2	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:37	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:43	2	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:47	1	WET CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:35	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:29	2	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:38	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:18	2	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:39	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:39	2	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A5 (F0 MALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82035	M	900 MG/KG	ORAL/DENTAL	10-20-10	11:35	2	DRIED CLEAR MATERIAL AROUND MOUTH
82037	M	900 MG/KG	NORMAL	09-23-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82037	M	900 MG/KG	BEHAVIOR/CNS	09-25-10	12:01	P	HUNCHED POSTURE
				09-26-10	11:40	P	HUNCHED POSTURE
				09-27-10	11:40	P	HUNCHED POSTURE
				09-28-10	11:39	P	HUNCHED POSTURE
				09-29-10	11:44	P	HUNCHED POSTURE
				09-30-10	11:49	P	HUNCHED POSTURE
				10-01-10	11:43	P	HUNCHED POSTURE
				10-04-10	11:38	P	HUNCHED POSTURE
				10-06-10	11:43	P	HUNCHED POSTURE
				10-08-10	11:48	P	HUNCHED POSTURE
				10-21-10	11:28	P	HUNCHED POSTURE
82037	M	900 MG/KG	BODY/INTEGUMENT	09-26-10	11:40	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:44	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:44	1	WET CLEAR MATERIAL LEFT FORELIMB
				09-29-10	11:44	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-30-10	11:49	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:42	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-02-10	11:36	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-03-10	11:28	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-04-10	11:38	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-05-10	11:30	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-06-10	11:42	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-07-10	11:44	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:47	3	WET YELLOW MATERIAL UROGENITAL AREA
				10-09-10	11:45	2	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82037	M	900 MG/KG	BODY/INTEGUMENT	10-10-10	11:36	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:30	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:39	3	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-13-10	11:27	2	WET YELLOW MATERIAL UROGENITAL AREA
82037	M	900 MG/KG	EXCRETA	09-26-10	11:40	P	SOFT STOOL
82037	M	900 MG/KG	ORAL/DENTAL	09-25-10	12:00	2	WET CLEAR MATERIAL AROUND MOUTH
				09-26-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:38	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:44	3	WET CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:49	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:36	1	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:38	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:47	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:45	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:36	2	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:39	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:18	1	WET RED MATERIAL AROUND MOUTH
				10-18-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:39	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:35	1	DRIED CLEAR MATERIAL AROUND MOUTH
82040	M	900 MG/KG	NORMAL	09-23-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	12:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 10-21-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82040	M	900 MG/KG	NORMAL	09-30-10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82040	M	900 MG/KG	BODY/INTEGUMENT	10-13-10	11:28	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-15-10	11:39	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-18-10	11:40	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-19-10	11:40	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-20-10	11:36	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-21-10	11:28	1	WET YELLOW MATERIAL UROGENITAL AREA
82040	M	900 MG/KG	EYES/EARS/NOSE	10-19-10	11:40	2	DRIED RED MATERIAL AROUND NOSE
82040	M	900 MG/KG	ORAL/DENTAL	09-24-10	11:59	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:37	2	WET RED MATERIAL AROUND MOUTH
				10-05-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:48	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:37	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:39	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:40	3	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:40	2	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82040	M	900 MG/KG	ORAL/DENTAL	10-20-10	11:36	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:36	1	DRIED RED MATERIAL AROUND MOUTH
				10-21-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:28	1	DRIED RED MATERIAL AROUND MOUTH
82042	M	900 MG/KG	NORMAL	09-23-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82042	M	900 MG/KG	BEHAVIOR/CNS	09-25-10	12:03	P	HUNCHED POSTURE
82042	M	900 MG/KG	BODY/INTEGUMENT	10-02-10	11:37	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-02-10	11:37	1	WET CLEAR MATERIAL LEFT FORELIMB
82042	M	900 MG/KG	ORAL/DENTAL	09-28-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:37	2	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:28	2	DRIED RED MATERIAL AROUND MOUTH
				10-04-10	11:39	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:48	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:48	1	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82042	M	900 MG/KG	ORAL/DENTAL	10-11-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:31	1	DRIED RED MATERIAL AROUND MOUTH
				10-12-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:29	1	DRIED RED MATERIAL AROUND MOUTH
82043	M	900 MG/KG	NORMAL	09-23-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	12:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
82043	M	900 MG/KG	BEHAVIOR/CNS	09-29-10	11:45	P	HUNCHED POSTURE
				10-03-10	11:29	P	HUNCHED POSTURE
				10-06-10	11:44	P	HUNCHED POSTURE
				10-08-10	11:49	P	HUNCHED POSTURE
				10-20-10	11:37	P	HUNCHED POSTURE
82043	M	900 MG/KG	BODY/INTEGUMENT	10-08-10	11:49	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-09-10	11:46	1	WET YELLOW MATERIAL UROGENITAL AREA
82043	M	900 MG/KG	ORAL/DENTAL	09-26-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:41	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:45	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:50	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:44	1	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:29	1	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:39	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:31	2	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
82043	M	900 MG/KG	ORAL/DENTAL	10-06-10	11:44	2	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:45	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:49	2	WET CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:46	2	WET CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:37	2	WET CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:32	3	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:41	2	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:28	3	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:38	2	WET CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:40	2	WET CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:19	2	WET CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:31	2	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:41	2	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:41	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:37	2	WET CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:29	2	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

FINAL REPORT

Contents:	Volume 4 of 6 (Appendix P [Tables A6-A52])
Study Title:	A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats
Laboratory Project ID:	WIL-402011
Author:	Jeffrey H. Charlap, MS
Test Guideline:	U.S. EPA OPPTS 870.3650 and 870.5395, ICH Guideline S2A and S2B, and OECD Guidelines 422 and 474
Study Completion Date:	30 August 2012
Performing Laboratory:	WIL Research Laboratories, LLC 1407 George Road Ashland, OH 44805-8946
Sponsor:	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
Total Number of Pages:	1897

APPENDIX P

Individual Animal Data (continued)

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81920	F	0 MG/KG	NORMAL	09-23-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81920	F	0 MG/KG	NORMAL	10-23-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920	F	0 MG/KG	BODY/INTEGUMENT	09-29-10	11:05	2	WET YELLOW MATERIAL ANOGENITAL AREA
81920	F	0 MG/KG	EXCRETA	09-29-10	11:08	P	DIARRHEA
81932	F	0 MG/KG	NORMAL	09-23-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81932	F	0 MG/KG	NORMAL	10-09-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938	F	0 MG/KG	NORMAL	09-23-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81938	F	0 MG/KG	NORMAL	09-29-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81938	F	0 MG/KG	NORMAL	10-28-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939	F	0 MG/KG	NORMAL	09-23-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81939	F	0 MG/KG	NORMAL	10-16-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942	F	0 MG/KG	NORMAL	09-23-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81942	F	0 MG/KG	NORMAL	10-05-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942	F	0 MG/KG	BODY/INTEGUMENT	10-28-10	11:00	1	WET YELLOW MATERIAL ANOGENITAL AREA
81950	F	0 MG/KG	NORMAL	09-23-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81950	F	0 MG/KG	NORMAL	09-24-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81950	F	0 MG/KG	NORMAL	10-30-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950	F	0 MG/KG	ORAL/DENTAL	10-14-10	10:55	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	10:53	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:03	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	10:58	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:04	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:00	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:00	1	DRIED CLEAR MATERIAL AROUND MOUTH
81958	F	0 MG/KG	NORMAL	09-23-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81958	F	0 MG/KG	NORMAL	10-11-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81966	F	0 MG/KG	NORMAL	09-23-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81966	F	0 MG/KG	NORMAL	09-30-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81966	F	0 MG/KG	NORMAL	10-29-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967	F	0 MG/KG	NORMAL	09-23-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81967	F	0 MG/KG	NORMAL	10-19-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967	F	0 MG/KG	ORAL/DENTAL	10-23-10	10:58	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	10:54	1	WET CLEAR MATERIAL AROUND MOUTH
81971	F	0 MG/KG	NORMAL	09-23-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81971	F	0 MG/KG	NORMAL	10-08-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81971	F	0 MG/KG	ORAL/DENTAL	09-29-10	11:06	1	WET CLEAR MATERIAL AROUND MOUTH
81975	F	0 MG/KG	NORMAL	09-23-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81975	F	0 MG/KG	NORMAL	09-27-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81975	F	0 MG/KG	NORMAL	10-26-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979	F	0 MG/KG	NORMAL	09-23-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81979	F	0 MG/KG	NORMAL	10-15-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915	F	100 MG/KG	NORMAL	09-23-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81915	F	100 MG/KG	NORMAL	10-04-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81915	F	100 MG/KG	NORMAL	11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916	F	100 MG/KG	NORMAL	09-23-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81916	F	100 MG/KG	NORMAL	10-22-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916	F	100 MG/KG	ORAL/DENTAL	09-29-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	10:55	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:02	1	DRIED RED MATERIAL AROUND MOUTH
				10-28-10	11:02	2	DRIED CLEAR MATERIAL AROUND MOUTH
81917	F	100 MG/KG	NORMAL	09-23-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81917	F	100 MG/KG	NORMAL	10-08-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917	F	100 MG/KG	ORAL/DENTAL	10-12-10	11:01	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	10:59	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	10:59	1	DRIED RED MATERIAL AROUND MOUTH
				10-26-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:02	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:01	1	DRIED CLEAR MATERIAL AROUND MOUTH
81921	F	100 MG/KG	NORMAL	09-23-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81921	F	100 MG/KG	NORMAL	09-24-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81921	F	100 MG/KG	NORMAL	10-24-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921	F	100 MG/KG	ORAL/DENTAL	09-29-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
81926	F	100 MG/KG	NORMAL	09-23-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81926	F	100 MG/KG	NORMAL	10-09-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930	F	100 MG/KG	NORMAL	09-23-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81930	F	100 MG/KG	NORMAL	09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81930	F	100 MG/KG	NORMAL	10-27-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930	F	100 MG/KG	EYES/EARS/NOSE	10-14-10	11:10	2	DRIED RED MATERIAL AROUND NOSE
81930	F	100 MG/KG	ORAL/DENTAL	10-24-10	11:06	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
81941	F	100 MG/KG	NORMAL	09-23-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81941	F	100 MG/KG	NORMAL	10-19-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941	F	100 MG/KG	ORAL/DENTAL	09-29-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:19	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:06	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:03	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:00	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:15	1	DRIED RED MATERIAL AROUND MOUTH
81960	F	100 MG/KG	NORMAL	09-23-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81960	F	100 MG/KG	NORMAL	10-04-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960	F	100 MG/KG	ORAL/DENTAL	09-29-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81960	F	100 MG/KG	ORAL/DENTAL	10-28-10	11:03	2	WET CLEAR MATERIAL AROUND MOUTH
81961	F	100 MG/KG	NORMAL	09-23-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81961	F	100 MG/KG	NORMAL	10-21-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962	F	100 MG/KG	NORMAL	09-23-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81962	F	100 MG/KG	NORMAL	10-09-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962	F	100 MG/KG	EYES/EARS/NOSE	09-29-10	11:11	1	WET CLEAR MATERIAL AROUND NOSE
81962	F	100 MG/KG	ORAL/DENTAL	09-29-10	11:10	2	WET CLEAR MATERIAL AROUND MOUTH
81972	F	100 MG/KG	NORMAL	09-23-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81972	F	100 MG/KG	NORMAL	09-25-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972	F	100 MG/KG	ORAL/DENTAL	09-29-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81972	F	100 MG/KG	ORAL/DENTAL	10-01-10	11:15	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-17-10	11:45	1	DRIED RED MATERIAL AROUND MOUTH
				10-19-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:08	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:07	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:12	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:04	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:04	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:02	1	DRIED CLEAR MATERIAL AROUND MOUTH
81978	F	100 MG/KG	NORMAL	09-23-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81978	F	100 MG/KG	NORMAL	10-12-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81978	F	100 MG/KG	ORAL/DENTAL	10-23-10	11:01	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:04	1	DRIED CLEAR MATERIAL AROUND MOUTH
81914	F	300 MG/KG	NORMAL	09-23-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81914	F	300 MG/KG	NORMAL	10-02-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-08-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-09-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81914	F	300 MG/KG	NORMAL	11-12-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914	F	300 MG/KG	ORAL/DENTAL	09-29-10	11:21	2	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:08	2	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:26	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:03	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:44	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-04-10	10:55	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-05-10	11:01	2	WET CLEAR MATERIAL AROUND MOUTH
				11-06-10	11:25	1	WET CLEAR MATERIAL AROUND MOUTH
				11-07-10	10:59	2	WET CLEAR MATERIAL AROUND MOUTH
				11-10-10	11:05	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-11-10	10:48	2	WET CLEAR MATERIAL AROUND MOUTH
81931	F	300 MG/KG	NORMAL	09-23-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81931	F	300 MG/KG	NORMAL	10-30-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931	F	300 MG/KG	ORAL/DENTAL	09-29-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:08	1	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:27	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:14	1	DRIED RED MATERIAL AROUND MOUTH
				10-14-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:21	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:09	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:02	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:07	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:04	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:04	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:16	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:44	2	WET CLEAR MATERIAL AROUND MOUTH
81934	F	300 MG/KG	NORMAL	09-23-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81934	F	300 MG/KG	NORMAL	09-24-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81934	F	300 MG/KG	NORMAL	10-23-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943	F	300 MG/KG	NORMAL	09-23-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81943	F	300 MG/KG	NORMAL	10-28-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943	F	300 MG/KG	ORAL/DENTAL	09-29-10	11:22	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:08	2	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:14	1	DRIED RED MATERIAL AROUND MOUTH
				10-14-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:16	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:02	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:13	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:05	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:05	1	DRIED RED MATERIAL AROUND MOUTH
				10-29-10	11:04	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-31-10	11:03	2	WET CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
81945	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81945	F	300 MG/KG	NORMAL	09-26-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-05-10	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-07-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-08-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-10-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-12-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81945	F	300 MG/KG	BODY/INTEGUMENT	09-30-10	11:36	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:11	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:20	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-14-10	11:21	1	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81945	F	300 MG/KG	BODY/INTEGUMENT	10-23-10	11:03	1	WET YELLOW MATERIAL UROGENITAL AREA
81945	F	300 MG/KG	EYES/EARS/NOSE	09-24-10	11:21	1	WET RED MATERIAL AROUND NOSE
				10-02-10	11:22	1	WET CLEAR MATERIAL AROUND NOSE
81945	F	300 MG/KG	ORAL/DENTAL	09-29-10	11:22	2	WET CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:21	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:08	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:47	1	DRIED RED MATERIAL AROUND MOUTH
				10-11-10	11:10	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:13	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:17	1	DRIED RED MATERIAL AROUND MOUTH
				10-22-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:03	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:08	1	DRIED RED MATERIAL AROUND MOUTH
				10-25-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-31-10	11:03	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:45	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-04-10	10:55	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-06-10	11:26	1	DRIED RED MATERIAL AROUND MOUTH
				11-09-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-11-10	10:49	2	DRIED CLEAR MATERIAL AROUND MOUTH
81946	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81946	F	300 MG/KG	NORMAL	09-26-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946	F	300 MG/KG	EYES/EARS/NOSE	09-25-10	11:25	2	WET CLEAR MATERIAL AROUND NOSE
				09-29-10	11:22	2	WET CLEAR MATERIAL AROUND NOSE
				10-23-10	11:03	1	WET CLEAR MATERIAL AROUND NOSE
				10-31-10	11:03	1	DRIED RED MATERIAL AROUND NOSE
81946	F	300 MG/KG	ORAL/DENTAL	09-25-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:22	3	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:12	1	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81946	F	300 MG/KG	ORAL/DENTAL	10-14-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:03	2	WET CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:08	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:14	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:06	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:06	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:05	2	WET CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:03	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-31-10	11:03	1	DRIED RED MATERIAL AROUND MOUTH
81947	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81947	F	300 MG/KG	NORMAL	10-07-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-07-10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-08-10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-11-10	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-13-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81947	F	300 MG/KG	BODY/INTEGUMENT	10-05-10	11:21	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:30	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:21	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-14-10	11:20	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-20-10	11:22	1	WET YELLOW MATERIAL ANOGENITAL AREA
				11-05-10	11:02	1	WET YELLOW MATERIAL UROGENITAL AREA
81947	F	300 MG/KG	ORAL/DENTAL	10-12-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:13	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81947	F	300 MG/KG	ORAL/DENTAL	10-26-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:06	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:05	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:08	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:26	1	DRIED RED MATERIAL AROUND MOUTH
				11-03-10	11:45	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-04-10	10:55	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-04-10	10:55	1	DRIED RED MATERIAL AROUND MOUTH
				11-05-10	11:02	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-06-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-09-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-10-10	11:06	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-12-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-12-10	11:11	1	DRIED RED MATERIAL AROUND MOUTH
81957	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81957	F	300 MG/KG	NORMAL	10-16-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-05-10	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957	F	300 MG/KG	BODY/INTEGUMENT	10-07-10	11:30	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:31	3	WET YELLOW MATERIAL UROGENITAL AREA
				10-09-10	11:48	3	WET YELLOW MATERIAL UROGENITAL AREA
				10-09-10	11:48	3	WET YELLOW MATERIAL ANOGENITAL AREA
				10-11-10	11:13	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:13	1	WET YELLOW MATERIAL ANOGENITAL AREA
				10-12-10	11:24	1	DRIED YELLOW MATERIAL UROGENITAL AREA
81957	F	300 MG/KG	ORAL/DENTAL	09-29-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:30	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:23	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:15	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:15	1	DRIED RED MATERIAL AROUND MOUTH
				10-14-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:18	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:18	1	DRIED RED MATERIAL AROUND MOUTH
				10-22-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:04	2	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81957	F	300 MG/KG	ORAL/DENTAL	10-24-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:07	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:05	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:08	1	DRIED RED MATERIAL AROUND MOUTH
				10-31-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:18	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
81959	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81959	F	300 MG/KG	NORMAL	10-17-10	12:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959	F	300 MG/KG	BODY/INTEGUMENT	10-03-10	11:10	2	WET CLEAR MATERIAL VENTRAL THORACIC AREA
				10-03-10	11:10	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:10	1	WET CLEAR MATERIAL LEFT FORELIMB
81959	F	300 MG/KG	ORAL/DENTAL	10-03-10	11:09	2	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:15	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:07	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:09	1	DRIED RED MATERIAL AROUND MOUTH
81974	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81974	F	300 MG/KG	NORMAL	09-30-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81974	F	300 MG/KG	EYES/EARS/NOSE	09-24-10	11:23	2	WET CLEAR MATERIAL AROUND NOSE
81974	F	300 MG/KG	ORAL/DENTAL	09-24-10	11:24	2	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:28	1	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81974	F	300 MG/KG	ORAL/DENTAL	10-20-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:05	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:19	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:07	1	DRIED RED MATERIAL AROUND MOUTH
				10-29-10	11:06	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
81976	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-29-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-01-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-03-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81976	F	300 MG/KG	NORMAL	10-15-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-18-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976	F	300 MG/KG	BODY/INTEGUMENT	10-11-10	11:14	1	WET YELLOW MATERIAL UROGENITAL AREA
81976	F	300 MG/KG	ORAL/DENTAL	11-01-10	11:19	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-05-10	11:02	2	DRIED CLEAR MATERIAL AROUND MOUTH
81977	F	300 MG/KG	NORMAL	09-23-10	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-27-10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81977	F	300 MG/KG	NORMAL	09-30-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977	F	300 MG/KG	ORAL/DENTAL	09-29-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81977	F	300 MG/KG	ORAL/DENTAL	10-03-10	11:10	1	DRIED RED MATERIAL AROUND MOUTH
				10-15-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:13	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:19	1	DRIED RED MATERIAL AROUND MOUTH
				10-27-10	11:07	2	DRIED CLEAR MATERIAL AROUND MOUTH
81918	F	900 MG/KG	NORMAL	09-23-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-03-10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81918	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:40	P	HYPOACTIVITY
				09-24-10	11:41	1	TREMORS
				09-25-10	11:35	P	HYPOACTIVITY
				09-25-10	11:36	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-25-10	11:36	P	HUNCHED POSTURE
				09-26-10	11:23	P	HUNCHED POSTURE
				09-27-10	11:27	P	HUNCHED POSTURE
				09-28-10	11:24	P	HUNCHED POSTURE
				09-29-10	11:26	P	HUNCHED POSTURE
				09-29-10	11:27	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-03-10	11:11	P	WALKS ON TIPTOES
				10-03-10	11:12	P	HUNCHED POSTURE
				10-09-10	11:50	P	HUNCHED POSTURE
81918	F	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:33	3	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81918	F	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:33	3	WET YELLOW MATERIAL UROGENITAL AREA
				09-25-10	11:33	2	WET BROWN MATERIAL ANOGENITAL AREA
				09-26-10	11:23	2	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-26-10	11:23	2	WET YELLOW MATERIAL UROGENITAL AREA
				09-27-10	11:27	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-28-10	11:23	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:27	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:27	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:27	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-04-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-14-10	11:24	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-14-10	11:24	2	WET CLEAR MATERIAL LEFT FORELIMB
81918	F	900 MG/KG	CARDIO-PULMONARY	09-24-10	11:41	P	SHALLOW RESPIRATION
81918	F	900 MG/KG	EYES/EARS/NOSE	09-25-10	11:37	P	EYELIDS SLIGHTLY DROOPING
				09-29-10	11:26	2	WET CLEAR MATERIAL AROUND NOSE
81918	F	900 MG/KG	EXCRETA	09-25-10	11:30	P	DIARRHEA
81918	F	900 MG/KG	ORAL/DENTAL	09-26-10	11:23	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:26	3	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:26	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:32	1	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:35	1	WET CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:49	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:16	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:25	1	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81918	F	900 MG/KG	ORAL/DENTAL	10-13-10	11:16	2	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:24	3	WET CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:28	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:23	1	DRIED RED MATERIAL AROUND MOUTH
				10-18-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:30	2	WET CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:24	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:24	2	DRIED RED MATERIAL AROUND MOUTH
				10-21-10	11:20	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:20	2	DRIED RED MATERIAL AROUND MOUTH
				10-22-10	11:13	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:07	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:07	2	DRIED RED MATERIAL AROUND MOUTH
				10-24-10	11:11	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:11	1	DRIED RED MATERIAL AROUND MOUTH
				10-25-10	11:20	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:17	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:08	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:08	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:07	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:07	1	DRIED RED MATERIAL AROUND MOUTH
				10-30-10	11:11	1	WET CLEAR MATERIAL AROUND MOUTH
				10-31-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:19	2	WET CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
81919	F	900 MG/KG	NORMAL	09-23-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81919	F	900 MG/KG	NORMAL	10-07-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-24-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-25-10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-26-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-27-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:45	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-24-10	11:45	P	WALKS ON TIPTOES
				09-25-10	11:40	P	HUNCHED POSTURE
				09-25-10	11:40	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-26-10	11:25	P	HUNCHED POSTURE
				10-03-10	11:12	P	WALKS ON TIPTOES
81919	F	900 MG/KG	BODY/INTEGUMENT	09-26-10	11:25	1	WET YELLOW MATERIAL UROGENITAL AREA
81919	F	900 MG/KG	ORAL/DENTAL	09-25-10	11:39	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:28	2	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:39	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81919	F	900 MG/KG	ORAL/DENTAL	10-03-10	11:12	2	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:22	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:17	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:17	1	DRIED RED MATERIAL AROUND MOUTH
				10-14-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:20	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:46	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-04-10	10:57	2	DRIED CLEAR MATERIAL AROUND MOUTH
81927	F	900 MG/KG	NORMAL	09-23-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-06-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-14-10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:46	P	WALKS ON TIPTOES
				09-26-10	11:27	P	HUNCHED POSTURE
				10-03-10	11:13	P	WALKS ON TIPTOES
				10-03-10	11:13	P	HUNCHED POSTURE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81927	F	900 MG/KG	BEHAVIOR/CNS	10-07-10	11:33	P	HUNCHED POSTURE
				10-10-10	11:37	P	HUNCHED POSTURE
81927	F	900 MG/KG	BODY/INTEGUMENT	10-03-10	11:13	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:13	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-07-10	11:33	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-07-10	11:33	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-08-10	11:41	2	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				11-11-10	10:49	2	WET YELLOW MATERIAL UROGENITAL AREA
81927	F	900 MG/KG	CARDIO-PULMONARY	10-03-10	11:14	P	SHALLOW RESPIRATION
81927	F	900 MG/KG	EYES/EARS/NOSE	09-26-10	11:26	1	LACRIMATION RIGHT EYE
				09-28-10	11:25	1	LACRIMATION RIGHT EYE
				10-03-10	11:13	1	LACRIMATION RIGHT EYE
				10-03-10	11:13	1	LACRIMATION LEFT EYE
				10-04-10	11:30	2	DRIED RED MATERIAL AROUND NOSE
81927	F	900 MG/KG	ORAL/DENTAL	09-26-10	11:26	1	WET CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:28	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:28	2	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:39	2	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:13	3	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:30	2	DRIED RED MATERIAL AROUND MOUTH
				10-05-10	11:23	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:23	1	DRIED RED MATERIAL AROUND MOUTH
				10-06-10	11:27	1	WET CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:33	3	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:41	2	WET CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:50	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:37	1	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81927	F	900 MG/KG	ORAL/DENTAL	10-11-10	11:24	2	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:32	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:32	1	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:22	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:31	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:33	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:24	1	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:35	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:35	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:14	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:08	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:11	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:20	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:17	2	WET CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:09	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:08	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:20	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:46	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-04-10	10:57	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-05-10	11:02	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-07-10	10:59	1	WET CLEAR MATERIAL AROUND MOUTH
				11-08-10	11:00	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-08-10	11:00	1	DRIED RED MATERIAL AROUND MOUTH
				11-09-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-10-10	11:06	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-11-10	10:49	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81927	F	900 MG/KG	ORAL/DENTAL	11-12-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-13-10	11:07	1	WET CLEAR MATERIAL AROUND MOUTH
81936	F	900 MG/KG	NORMAL	09-23-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-26-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:47	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-25-10	11:41	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-25-10	11:41	P	HUNCHED POSTURE
				09-28-10	11:27	P	HUNCHED POSTURE
				09-28-10	11:27	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-03-10	11:14	P	WALKS ON TIPTOES
81936	F	900 MG/KG	BODY/INTEGUMENT	09-27-10	11:28	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-28-10	11:27	2	WET CLEAR MATERIAL RIGHT FORELIMB
				09-28-10	11:27	2	WET CLEAR MATERIAL LEFT FORELIMB
				09-29-10	11:29	2	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:29	2	WET CLEAR MATERIAL LEFT FORELIMB
81936	F	900 MG/KG	EYES/EARS/NOSE	09-28-10	11:26	3	WET CLEAR MATERIAL AROUND NOSE
				09-29-10	11:29	1	WET CLEAR MATERIAL AROUND NOSE
81936	F	900 MG/KG	ORAL/DENTAL	09-25-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:26	3	WET CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:29	3	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:33	2	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81936	F	900 MG/KG	ORAL/DENTAL	10-02-10	11:40	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:30	1	DRIED RED MATERIAL AROUND MOUTH
				10-05-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:23	1	DRIED RED MATERIAL AROUND MOUTH
				10-06-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:39	1	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:26	2	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:27	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:17	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:18	2	DRIED RED MATERIAL AROUND MOUTH
				10-14-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:26	2	DRIED RED MATERIAL AROUND MOUTH
				10-15-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:24	1	DRIED RED MATERIAL AROUND MOUTH
				10-18-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:31	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:14	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:09	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:09	1	DRIED RED MATERIAL AROUND MOUTH
				10-24-10	11:12	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:21	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:21	1	DRIED RED MATERIAL AROUND MOUTH
				10-26-10	11:18	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:09	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:09	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-31-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81936	F	900 MG/KG	ORAL/DENTAL	11-01-10	11:20	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:47	1	DRIED CLEAR MATERIAL AROUND MOUTH
81937	F	900 MG/KG	NORMAL	09-23-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81937	F	900 MG/KG	BEHAVIOR/CNS	10-03-10	11:15	P	WALKS ON TIPTOES
				10-03-10	11:15	P	HUNCHED POSTURE
81937	F	900 MG/KG	BODY/INTEGUMENT	10-01-10	11:33	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-02-10	11:40	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-02-10	11:40	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-02-10	11:41	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-03-10	11:14	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:15	1	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-03-10	11:15	2	DRIED YELLOW MATERIAL ANOGENITAL AREA
				10-03-10	11:15	2	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:18	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-11-10	11:18	1	WET YELLOW MATERIAL ANOGENITAL AREA
				10-12-10	11:27	2	DRIED YELLOW MATERIAL UROGENITAL AREA
81937	F	900 MG/KG	EYES/EARS/NOSE	10-28-10	11:10	1	DRIED RED MATERIAL AROUND NOSE
81937	F	900 MG/KG	ORAL/DENTAL	09-26-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81937	F	900 MG/KG	ORAL/DENTAL	09-29-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:33	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:40	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:14	2	DRIED RED MATERIAL AROUND MOUTH
				10-04-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:23	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:27	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:27	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:18	1	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:18	1	DRIED RED MATERIAL AROUND MOUTH
				10-14-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:26	2	DRIED RED MATERIAL AROUND MOUTH
				10-16-10	12:24	1	DRIED RED MATERIAL AROUND MOUTH
				10-17-10	12:25	2	DRIED RED MATERIAL AROUND MOUTH
				10-18-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:31	1	DRIED RED MATERIAL AROUND MOUTH
				10-19-10	11:31	2	WET CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:27	1	DRIED RED MATERIAL AROUND MOUTH
				10-21-10	11:23	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:23	2	DRIED RED MATERIAL AROUND MOUTH
				10-22-10	11:15	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:09	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:12	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:21	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:21	2	DRIED RED MATERIAL AROUND MOUTH
				10-26-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81937	F	900 MG/KG	ORAL/DENTAL	10-27-10	11:10	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:10	2	DRIED RED MATERIAL AROUND MOUTH
				10-28-10	11:10	1	DRIED RED MATERIAL AROUND MOUTH
				10-29-10	11:08	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:13	1	DRIED RED MATERIAL AROUND MOUTH
				10-31-10	11:12	1	DRIED RED MATERIAL AROUND MOUTH
				11-01-10	11:21	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:47	1	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:47	1	DRIED RED MATERIAL AROUND MOUTH
81951	F	900 MG/KG	NORMAL	09-23-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-22-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81951	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:49	P	HYPOACTIVITY
				09-25-10	11:43	P	HUNCHED POSTURE
				09-28-10	11:28	P	HUNCHED POSTURE
				10-03-10	11:16	P	WALKS ON TIPTOES
				10-27-10	11:11	P	HUNCHED POSTURE
81951	F	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:42	3	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-25-10	11:42	3	WET YELLOW MATERIAL UROGENITAL AREA
				09-26-10	11:28	1	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-26-10	11:28	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:30	2	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:31	2	WET CLEAR MATERIAL LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81951	F	900 MG/KG	BODY/INTEGUMENT	10-01-10	11:34	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-03-10	11:16	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:16	1	WET CLEAR MATERIAL LEFT FORELIMB
81951	F	900 MG/KG	CARDIO-PULMONARY	09-24-10	11:49	P	SHALLOW RESPIRATION
81951	F	900 MG/KG	EYES/EARS/NOSE	09-29-10	11:30	2	WET CLEAR MATERIAL AROUND NOSE
				10-03-10	11:16	1	LACRIMATION RIGHT EYE
81951	F	900 MG/KG	ORAL/DENTAL	09-25-10	11:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:28	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:30	3	WET CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:40	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:34	2	WET CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:16	3	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:31	1	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:24	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:28	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:38	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:19	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:19	1	DRIED RED MATERIAL AROUND MOUTH
				10-12-10	11:28	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:19	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:26	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:30	2	WET CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:24	1	DRIED RED MATERIAL AROUND MOUTH
				10-17-10	12:25	2	DRIED RED MATERIAL AROUND MOUTH
				10-18-10	11:31	2	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:31	1	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:31	2	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81951	F	900 MG/KG	ORAL/DENTAL	10-20-10	11:27	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:23	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:13	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:21	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:19	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:10	2	WET CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:10	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:09	2	DRIED CLEAR MATERIAL AROUND MOUTH
81955	F	900 MG/KG	NORMAL	09-23-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:50	P	HYPOACTIVITY
				09-24-10	11:50	3	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-25-10	11:48	P	WALKS ON TIPTOES
				09-25-10	11:48	P	HUNCHED POSTURE
				09-26-10	11:30	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-26-10	11:30	P	HUNCHED POSTURE
				09-28-10	11:30	P	HUNCHED POSTURE
				09-29-10	11:31	P	HUNCHED POSTURE
				10-03-10	11:17	P	WALKS ON TIPTOES
				10-03-10	11:17	P	HUNCHED POSTURE
				10-08-10	11:33	P	HUNCHED POSTURE
				10-08-10	11:33	P	WALKS ON TIPTOES
				10-11-10	11:20	P	HUNCHED POSTURE
				10-13-10	11:20	P	HUNCHED POSTURE
				10-18-10	11:32	P	HUNCHED POSTURE
				10-20-10	11:28	P	HUNCHED POSTURE
				10-22-10	11:16	P	HUNCHED POSTURE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81955	F	900 MG/KG	BEHAVIOR/CNS	10-24-10	11:13	P	HUNCHED POSTURE
				10-26-10	11:20	P	HUNCHED POSTURE
				10-27-10	11:12	P	HUNCHED POSTURE
				10-28-10	11:11	P	HUNCHED POSTURE
				10-29-10	11:10	P	HUNCHED POSTURE
				11-01-10	11:21	P	HUNCHED POSTURE
81955	F	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:45	3	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-25-10	11:45	3	WET YELLOW MATERIAL UROGENITAL AREA
				09-25-10	11:45	2	WET BROWN MATERIAL ANOGENITAL AREA
				09-29-10	11:31	2	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:32	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:32	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-03-10	11:17	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:17	1	WET CLEAR MATERIAL LEFT FORELIMB
81955	F	900 MG/KG	CARDIO-PULMONARY	10-03-10	11:17	P	SHALLOW RESPIRATION
81955	F	900 MG/KG	EYES/EARS/NOSE	09-29-10	11:31	1	WET CLEAR MATERIAL AROUND NOSE
81955	F	900 MG/KG	EXCRETA	09-25-10	11:45	P	DIARRHEA
81955	F	900 MG/KG	ORAL/DENTAL	09-27-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:31	3	WET CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:17	2	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:24	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-09-10	11:54	1	WET CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:19	2	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81955	F	900 MG/KG	ORAL/DENTAL	10-12-10	11:29	2	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:19	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:27	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:27	1	WET CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:25	1	DRIED RED MATERIAL AROUND MOUTH
				10-18-10	11:32	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:32	2	DRIED RED MATERIAL AROUND MOUTH
				10-19-10	11:32	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:32	2	DRIED RED MATERIAL AROUND MOUTH
				10-20-10	11:28	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:24	2	DRIED RED MATERIAL AROUND MOUTH
				10-22-10	11:16	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:16	2	DRIED RED MATERIAL AROUND MOUTH
				10-23-10	11:10	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:10	2	DRIED RED MATERIAL AROUND MOUTH
				10-24-10	11:13	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:22	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:11	3	DRIED RED MATERIAL AROUND MOUTH
				10-28-10	11:11	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:11	1	DRIED RED MATERIAL AROUND MOUTH
				10-29-10	11:10	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:10	2	DRIED RED MATERIAL AROUND MOUTH
				10-30-10	11:13	1	DRIED RED MATERIAL AROUND MOUTH
				10-31-10	11:13	1	DRIED CLEAR MATERIAL AROUND MOUTH
81964	F	900 MG/KG	NORMAL	09-23-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-28-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81964	F	900 MG/KG	NORMAL	10-02-10	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-06-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-11-10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-15-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-20-10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-23-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81964	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:52	2	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-24-10	11:52	P	WALKS ON TIPTOES
				09-25-10	11:49	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-25-10	11:49	P	HUNCHED POSTURE
				09-29-10	11:32	P	HUNCHED POSTURE
				11-02-10	11:29	P	HUNCHED POSTURE
				11-02-10	11:29	2	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-10	11:30	P	HYPOACTIVITY
81964	F	900 MG/KG	BODY/INTEGUMENT	09-26-10	11:31	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:32	2	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-29-10	11:32	2	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:32	2	WET CLEAR MATERIAL LEFT FORELIMB
				10-07-10	11:35	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-19-10	11:33	1	WET YELLOW MATERIAL UROGENITAL AREA
81964	F	900 MG/KG	EYES/EARS/NOSE	09-29-10	11:32	2	WET CLEAR MATERIAL AROUND NOSE
				11-02-10	11:29	P	EYELIDS SLIGHTLY DROOPING
81964	F	900 MG/KG	EXCRETA	09-27-10	11:30	P	SOFT STOOL
81964	F	900 MG/KG	ORAL/DENTAL	09-25-10	11:49	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81964	F	900 MG/KG	ORAL/DENTAL	09-29-10	11:32	3	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:18	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:35	1	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:29	1	DRIED RED MATERIAL AROUND MOUTH
				10-13-10	11:20	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:27	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:25	1	DRIED RED MATERIAL AROUND MOUTH
				10-17-10	12:26	1	DRIED RED MATERIAL AROUND MOUTH
				10-18-10	11:32	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:32	2	DRIED RED MATERIAL AROUND MOUTH
				10-19-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:24	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:24	1	DRIED RED MATERIAL AROUND MOUTH
				10-22-10	11:16	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:16	2	DRIED RED MATERIAL AROUND MOUTH
				10-24-10	11:14	1	WET CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:14	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:20	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:12	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:10	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:13	1	WET CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:21	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:28	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:28	2	DRIED RED MATERIAL AROUND MOUTH
81968	F	900 MG/KG	NORMAL	09-23-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81968	F	900 MG/KG	NORMAL	10-09-10	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81968	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:52	2	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-24-10	11:53	P	WALKS ON TIPTOES
				09-26-10	11:32	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-26-10	11:32	P	HUNCHED POSTURE
				09-27-10	11:31	P	HUNCHED POSTURE
				09-27-10	11:31	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-29-10	11:33	P	HUNCHED POSTURE
				09-29-10	11:34	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-30-10	11:42	P	HUNCHED POSTURE
				10-03-10	11:19	P	WALKS ON TIPTOES
				10-04-10	11:32	P	HUNCHED POSTURE
				10-05-10	11:24	P	HUNCHED POSTURE
81968	F	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:50	2	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				09-25-10	11:50	3	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:34	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:34	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-01-10	11:35	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-02-10	11:42	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-02-10	11:42	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-02-10	11:42	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-03-10	11:18	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:18	2	WET CLEAR MATERIAL LEFT FORELIMB
				10-03-10	11:18	2	DRIED YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-03-10	11:18	2	WET YELLOW MATERIAL ANOGENITAL AREA
				10-03-10	11:19	2	DRIED YELLOW MATERIAL LEFT HINDLIMB
				10-04-10	11:32	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-04-10	11:32	1	WET CLEAR MATERIAL LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81968	F	900 MG/KG	BODY/INTEGUMENT	10-06-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:42	2	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-11-10	11:21	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:30	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-31-10	11:14	1	WET CLEAR MATERIAL VENTRAL THORACIC AREA
81968	F	900 MG/KG	CARDIO-PULMONARY	10-03-10	11:19	P	SHALLOW RESPIRATION
81968	F	900 MG/KG	EYES/EARS/NOSE	09-26-10	11:31	2	WET CLEAR MATERIAL AROUND NOSE
				09-29-10	11:34	2	WET CLEAR MATERIAL AROUND NOSE
				10-03-10	11:18	1	LACRIMATION RIGHT EYE
				10-03-10	11:18	1	LACRIMATION LEFT EYE
				10-31-10	11:14	2	WET CLEAR MATERIAL AROUND NOSE
81968	F	900 MG/KG	EXCRETA	09-25-10	11:50	P	DIARRHEA
81968	F	900 MG/KG	ORAL/DENTAL	09-24-10	11:52	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-26-10	11:31	2	WET CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:31	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:34	3	WET CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:41	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:35	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:42	2	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:18	3	WET CLEAR MATERIAL AROUND MOUTH
				10-04-10	11:32	3	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-07-10	11:35	2	WET CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:42	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:30	2	WET CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:20	3	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:28	2	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81968	F	900 MG/KG	ORAL/DENTAL	10-15-10	11:31	2	WET CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:25	1	DRIED RED MATERIAL AROUND MOUTH
				10-17-10	12:26	2	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:33	2	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:33	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:29	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:24	2	WET CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:17	3	WET CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:11	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:14	2	WET CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:22	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:20	3	WET CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:13	3	WET CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:12	1	WET CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:12	1	DRIED RED MATERIAL AROUND MOUTH
				10-29-10	11:10	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-30-10	11:14	1	WET CLEAR MATERIAL AROUND MOUTH
				10-31-10	11:14	3	WET CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:22	3	DRIED CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:47	1	DRIED CLEAR MATERIAL AROUND MOUTH
81969	F	900 MG/KG	NORMAL	09-23-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-25-10	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-09-10	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-17-10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81969	F	900 MG/KG	NORMAL	10-24-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-28-10	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-29-10	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-31-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:53	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-26-10	11:33	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-29-10	11:35	P	HUNCHED POSTURE
				10-03-10	11:20	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-07-10	11:36	P	HUNCHED POSTURE
81969	F	900 MG/KG	BODY/INTEGUMENT	09-28-10	11:31	1	WET CLEAR MATERIAL RIGHT FORELIMB
				09-28-10	11:31	1	WET CLEAR MATERIAL LEFT FORELIMB
				09-29-10	11:35	2	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:35	2	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:35	2	WET CLEAR MATERIAL LEFT FORELIMB
				10-03-10	11:19	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:20	2	WET CLEAR MATERIAL LEFT FORELIMB
				10-05-10	11:25	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-06-10	11:29	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-07-10	11:36	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-07-10	11:36	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-11-10	11:22	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-12-10	11:31	1	WET YELLOW MATERIAL UROGENITAL AREA
81969	F	900 MG/KG	CARDIO-PULMONARY	10-10-10	11:40	P	RALES
81969	F	900 MG/KG	EYES/EARS/NOSE	09-29-10	11:35	2	WET CLEAR MATERIAL AROUND NOSE
81969	F	900 MG/KG	ORAL/DENTAL	09-26-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81969	F	900 MG/KG	ORAL/DENTAL	09-28-10	11:31	2	WET CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:35	3	WET CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:35	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-02-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:19	2	DRIED RED MATERIAL AROUND MOUTH
				10-04-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:25	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:25	1	DRIED RED MATERIAL AROUND MOUTH
				10-07-10	11:36	3	WET CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:40	2	WET CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:21	1	DRIED RED MATERIAL AROUND MOUTH
				10-14-10	11:28	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:33	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:17	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:12	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:23	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:21	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:14	1	DRIED CLEAR MATERIAL AROUND MOUTH
81973	F	900 MG/KG	NORMAL	09-23-10	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-07-10	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-08-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81973	F	900 MG/KG	NORMAL	10-31-10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-02-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973	F	900 MG/KG	BEHAVIOR/CNS	09-24-10	11:54	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-26-10	11:34	P	HUNCHED POSTURE
				09-26-10	11:34	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-27-10	11:33	P	HUNCHED POSTURE
				09-27-10	11:33	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-30-10	11:43	P	HUNCHED POSTURE
				10-01-10	11:36	P	HUNCHED POSTURE
				10-03-10	11:20	P	HUNCHED POSTURE
				10-03-10	11:21	P	WALKS ON TIPTOES
				10-21-10	11:26	P	HUNCHED POSTURE
				10-24-10	11:16	P	HUNCHED POSTURE
				10-29-10	11:11	P	HUNCHED POSTURE
81973	F	900 MG/KG	BODY/INTEGUMENT	09-25-10	11:52	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-01-10	11:36	1	WET CLEAR MATERIAL RIGHT FORELIMB
				10-01-10	11:36	1	WET CLEAR MATERIAL LEFT FORELIMB
				10-03-10	11:20	2	WET CLEAR MATERIAL RIGHT FORELIMB
				10-03-10	11:20	2	WET CLEAR MATERIAL LEFT FORELIMB
81973	F	900 MG/KG	CARDIO-PULMONARY	10-03-10	11:21	P	SHALLOW RESPIRATION
81973	F	900 MG/KG	ORAL/DENTAL	09-26-10	11:33	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-27-10	11:32	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-28-10	11:31	1	DRIED CLEAR MATERIAL AROUND MOUTH
				09-29-10	11:36	2	DRIED CLEAR MATERIAL AROUND MOUTH
				09-30-10	11:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:36	2	WET CLEAR MATERIAL AROUND MOUTH
				10-03-10	11:20	2	WET CLEAR MATERIAL AROUND MOUTH
				10-05-10	11:25	2	WET CLEAR MATERIAL AROUND MOUTH
				10-06-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A6 (F0 FEMALES - 1 HOUR POST-DOSING)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81973	F	900 MG/KG	ORAL/DENTAL	10-09-10	11:55	1	WET CLEAR MATERIAL AROUND MOUTH
				10-10-10	11:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:23	2	WET CLEAR MATERIAL AROUND MOUTH
				10-12-10	11:31	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-13-10	11:21	2	WET CLEAR MATERIAL AROUND MOUTH
				10-14-10	11:29	2	WET CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:32	2	WET CLEAR MATERIAL AROUND MOUTH
				10-16-10	12:26	2	DRIED RED MATERIAL AROUND MOUTH
				10-16-10	12:26	2	WET CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:27	2	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:34	2	WET CLEAR MATERIAL AROUND MOUTH
				10-19-10	11:34	2	WET CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:29	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-21-10	11:25	2	WET CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:18	2	WET CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:12	2	WET CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:15	2	WET CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:23	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:22	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:14	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:13	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:11	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-01-10	11:22	2	WET CLEAR MATERIAL AROUND MOUTH
81980	F	900 MG/KG	NORMAL	09-23-10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-24-10	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				09-30-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-02-10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-04-10	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-05-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81980	F	900 MG/KG	NORMAL	10-06-10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-10-10	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-12-10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-13-10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-14-10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-16-10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-19-10	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-21-10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10-30-10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-01-10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11-04-10	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980	F	900 MG/KG	BEHAVIOR/CNS	09-25-10	11:53	P	HUNCHED POSTURE
				09-26-10	11:34	P	HUNCHED POSTURE
				09-26-10	11:35	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				09-28-10	11:32	P	HUNCHED POSTURE
				10-03-10	11:21	1	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-08-10	11:43	P	HUNCHED POSTURE
				11-03-10	11:48	P	HUNCHED POSTURE
				11-05-10	11:03	P	HUNCHED POSTURE
81980	F	900 MG/KG	BODY/INTEGUMENT	09-26-10	11:34	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-27-10	11:33	1	WET YELLOW MATERIAL UROGENITAL AREA
				09-29-10	11:36	2	WET CLEAR MATERIAL RIGHT FORELIMB
				09-29-10	11:36	2	WET CLEAR MATERIAL LEFT FORELIMB
				10-07-10	11:37	2	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:43	3	WET YELLOW MATERIAL UROGENITAL AREA
				10-08-10	11:43	3	WET YELLOW MATERIAL VENTRAL ABDOMINAL AREA
				10-09-10	11:51	3	WET YELLOW MATERIAL UROGENITAL AREA
				10-09-10	11:51	3	WET YELLOW MATERIAL ANOGENITAL AREA
				10-29-10	11:12	2	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 09-23-10 TO 11-14-10

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
				POST-DOSING OBSERVATIONS			
81980	F	900 MG/KG	EYES/EARS/NOSE	09-29-10	11:36	2	WET CLEAR MATERIAL AROUND NOSE
81980	F	900 MG/KG	ORAL/DENTAL	09-29-10	11:36	3	WET CLEAR MATERIAL AROUND MOUTH
				10-01-10	11:36	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-08-10	11:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-11-10	11:23	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-15-10	11:32	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-17-10	12:27	1	WET CLEAR MATERIAL AROUND MOUTH
				10-18-10	11:34	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-20-10	11:30	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-22-10	11:18	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-23-10	11:13	2	DRIED CLEAR MATERIAL AROUND MOUTH
				10-24-10	11:16	3	DRIED CLEAR MATERIAL AROUND MOUTH
				10-25-10	11:24	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-26-10	11:22	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-27-10	11:15	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-28-10	11:13	2	WET CLEAR MATERIAL AROUND MOUTH
				10-29-10	11:12	1	DRIED CLEAR MATERIAL AROUND MOUTH
				10-31-10	11:15	2	WET CLEAR MATERIAL AROUND MOUTH
				11-02-10	11:31	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-03-10	11:48	2	DRIED CLEAR MATERIAL AROUND MOUTH
				11-05-10	11:03	1	DRIED CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

	MALES						
DAY	-7	0	7	13	20	27	28
ANIMALS FROM GROUP 1: SHAM CONTROL							
81983	362.	393.	410.	424.	441.	468.	NA
81990	385.	420.	435.	454.	464.	485.	NA
82004	364.	396.	417.	438.	451.	476.	NA
82012	366.	395.	411.	442.	464.	498.	490.
82017	357.	374.	394.	406.	419.	432.	419.
MEAN	367.	395.	413.	433.	448.	472.	455.
S.D.	10.7	16.2	14.5	18.3	18.9	25.0	49.9
S.E.	4.8	7.2	6.5	8.2	8.4	11.2	35.3
N	5	5	5	5	5	5	2

NA = NOT APPLICABLE

	MALES						
DAY	-7	0	7	13	20	27	28
ANIMALS FROM GROUP 2:	0 MG/KG						
81988	360.	373.	393.	419.	445.	466.	467.
81989	338.	354.	364.	388.	406.	413.	413.
81991	390.	424.	441.	471.	490.	516.	520.
81996	331.	335.	342.	372.	392.	418.	NA
81997	378.	406.	432.	448.	472.	494.	NA
81998	377.	402.	428.	463.	484.	510.	NA
82014	394.	448.	480.	517.	549.	587.	590.
82020	363.	398.	418.	432.	457.	484.	NA
82021	366.	376.	401.	422.	440.	467.	470.
82025	385.	402.	425.	445.	466.	485.	NA
82038	369.	404.	432.	462.	482.	513.	NA
82041	375.	398.	418.	437.	457.	477.	473.
MEAN	369.	393.	414.	440.	462.	486.	489.
S.D.	19.3	30.3	36.1	38.2	40.8	46.0	60.2
S.E.	5.6	8.7	10.4	11.0	11.8	13.3	24.6
N	12	12	12	12	12	12	6

NA = NOT APPLICABLE

	MALES						
DAY	-7	0	7	13	20	27	28
ANIMALS FROM GROUP 3: 100 MG/KG							
81982	400.	413.	406.	430.	461.	483.	487.
81987	344.	351.	369.	378.	389.	404.	407.
81994	358.	381.	403.	425.	446.	472.	NA
82001	382.	415.	439.	462.	482.	497.	NA
82003	382.	412.	461.	488.	520.	548.	NA
82007	387.	406.	419.	457.	496.	522.	524.
82011	374.	384.	406.	423.	447.	469.	NA
82016	389.	437.	461.	490.	512.	540.	546.
82022	368.	395.	410.	423.	439.	452.	NA
82024	351.	371.	384.	398.	414.	430.	437.
82034	346.	341.	366.	392.	408.	418.	422.
82046	378.	402.	426.	446.	475.	496.	NA
MEAN	372.	392.	413.	434.	457.	478.	470.
S.D.	18.2	27.9	31.3	35.6	41.5	46.1	57.1
S.E.	5.3	8.0	9.0	10.3	12.0	13.3	23.3
N	12	12	12	12	12	12	6

NA = NOT APPLICABLE

TABLE A7 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

	MALES						
DAY	-7	0	7	13	20	27	28
ANIMALS FROM GROUP 4: 300 MG/KG							
81993	332.	355.	350.	358.	377.	396.	NA
81995	344.	366.	383.	405.	424.	433.	NA
82000	358.	384.	417.	439.	465.	482.	487.
82002	383.	413.	426.	449.	466.	488.	487.
82005	376.	397.	433.	460.	472.	486.	488.
82013	362.	378.	394.	412.	425.	444.	NA
82015	356.	381.	405.	431.	443.	455.	455.
82023	373.	403.	429.	452.	460.	485.	NA
82031	375.	402.	428.	451.	461.	485.	NA
82036	382.	422.	448.	483.	497.	529.	530.
82039	371.	382.	399.	425.	440.	454.	457.
82044	383.	407.	427.	449.	458.	481.	NA
MEAN	366.	391.	411.	434.	449.	468.	484.
S.D.	16.3	19.8	26.8	32.2	30.6	34.1	27.2
S.E.	4.7	5.7	7.7	9.3	8.8	9.8	11.1
N	12	12	12	12	12	12	6

NA = NOT APPLICABLE

TABLE A7 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

	MALES						
DAY	-7	0	7	13	20	27	28
ANIMALS FROM GROUP 5:	900 MG/KG						
82006	386.	416.	437.	450.	470.	496.	NA
82009	387.	417.	411.	432.	449.	483.	477.
82010	366.	372.	377.	403.	426.	447.	NA
82018	368.	391.	398.	418.	432.	446.	NA
82028	373.	388.	398.	420.	435.	458.	450.
82029	357.	376.	380.	398.	427.	441.	NA
82030	358.	367.	373.	384.	402.	422.	NA
82035	375.	396.	398.	425.	434.	453.	NA
82037	345.	375.	370.	391.	416.	438.	432.
82040	389.	409.	415.	425.	443.	455.	454.
82042	365.	382.	362.	372.	387.	399.	396.
82043	337.	349.	355.	378.	394.	408.	404.
MEAN	367.	386.	389.	408.	426.	446.	435.
S.D.	16.3	20.7	24.1	24.0	23.8	27.6	31.2
S.E.	4.7	6.0	7.0	6.9	6.9	8.0	12.7
N	12	12	12	12	12	12	6

NA = NOT APPLICABLE

	MALES						
DAY	-7	0	7	13	20	27	28
ANIMALS FROM GROUP 6: 60 MG/KG CYC							
81985	369.	396.	411.	438.	445.	474.	NA
81992	354.	391.	416.	446.	466.	503.	NA
82008	351.	394.	429.	455.	476.	480.	473.
82026	388.	439.	460.	464.	483.	509.	510.
82033	368.	380.	401.	421.	437.	459.	466.
MEAN	366.	400.	424.	445.	461.	485.	483.
S.D.	15.1	22.6	23.0	16.6	19.8	20.8	23.2
S.E.	6.7	10.1	10.3	7.4	8.9	9.3	13.4
N	5	5	5	5	5	5	3

NA = NOT APPLICABLE

TABLE A8 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

	MALES							
DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 28	0- 13	0- 27
ANIMALS FROM GROUP 1: SHAM CONTROL								
81983	31.	17.	14.	17.	27.	NA	31.	75.
81990	35.	15.	19.	10.	21.	NA	35.	65.
82004	32.	21.	21.	13.	25.	NA	42.	80.
82012	29.	16.	31.	22.	34.	-8.	47.	103.
82017	17.	20.	12.	13.	13.	-12.	32.	58.
MEAN	29.	18.	19.	15.	24.	-10.	37.	76.
S.D.	6.7	2.6	7.3	4.8	7.9	2.9	6.8	17.4
S.E.	3.0	1.2	3.2	2.2	3.5	2.1	3.0	7.8
N	5	5	5	5	5	2	5	5

NA = NOT APPLICABLE

MALES

DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 28	0- 13	0- 27
ANIMALS FROM GROUP 2: 0 MG/KG								
81988	13.	20.	26.	26.	21.	2.	46.	93.
81989	16.	10.	24.	18.	7.	0.	34.	59.
81991	34.	17.	30.	20.	26.	3.	47.	93.
81996	4.	8.	30.	20.	26.	NA	37.	83.
81997	29.	25.	16.	24.	22.	NA	41.	87.
81998	26.	25.	35.	21.	26.	NA	61.	108.
82014	54.	32.	37.	33.	37.	4.	68.	139.
82020	35.	20.	14.	24.	27.	NA	34.	86.
82021	10.	25.	21.	18.	27.	3.	46.	91.
82025	17.	23.	20.	21.	19.	NA	43.	83.
82038	35.	28.	30.	20.	31.	NA	58.	109.
82041	22.	20.	19.	19.	21.	-4.	40.	80.
MEAN	25.	21.	25.	22.	24.	1.	46.	92.
S.D.	13.7	7.0	7.3	4.3	7.4	3.0	10.9	19.5
S.E.	3.9	2.0	2.1	1.2	2.2	1.2	3.1	5.6
N	12	12	12	12	12	6	12	12

NA = NOT APPLICABLE

TABLE A8 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 28	0- 13	0- 27
ANIMALS FROM GROUP 3: 100 MG/KG								
81982	14.	-8.	24.	31.	22.	4.	16.	70.
81987	8.	17.	10.	11.	15.	3.	27.	53.
81994	23.	22.	22.	21.	26.	NA	44.	91.
82001	33.	24.	23.	21.	15.	NA	47.	82.
82003	30.	50.	26.	33.	27.	NA	76.	136.
82007	19.	13.	38.	40.	26.	2.	50.	116.
82011	11.	22.	17.	24.	22.	NA	38.	84.
82016	48.	25.	28.	22.	28.	6.	53.	103.
82022	27.	15.	14.	16.	13.	NA	29.	58.
82024	20.	14.	13.	16.	17.	7.	27.	60.
82034	-5.	25.	26.	16.	10.	4.	51.	77.
82046	24.	24.	19.	29.	21.	NA	43.	94.
MEAN	21.	20.	22.	23.	20.	4.	42.	85.
S.D.	13.4	13.0	7.7	8.4	6.0	1.9	15.8	24.7
S.E.	3.9	3.8	2.2	2.4	1.7	0.8	4.6	7.1
N	12	12	12	12	12	6	12	12

NA = NOT APPLICABLE

TABLE A8 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

	MALES							
DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 28	0- 13	0- 27
ANIMALS FROM GROUP 4: 300 MG/KG								
81993	24.	-5.	7.	19.	19.	NA	2.	40.
81995	22.	17.	22.	19.	8.	NA	39.	66.
82000	27.	33.	22.	26.	17.	5.	55.	98.
82002	30.	12.	24.	17.	22.	-2.	36.	75.
82005	22.	36.	26.	12.	14.	2.	62.	89.
82013	17.	15.	18.	13.	20.	NA	33.	66.
82015	25.	24.	26.	12.	11.	0.	50.	74.
82023	31.	26.	22.	9.	25.	NA	48.	82.
82031	27.	26.	23.	11.	24.	NA	49.	83.
82036	40.	26.	35.	14.	32.	1.	61.	106.
82039	12.	16.	27.	15.	14.	3.	43.	72.
82044	24.	20.	23.	9.	23.	NA	42.	74.
MEAN	25.	21.	23.	15.	19.	2.	43.	77.
S.D.	7.1	10.7	6.5	5.0	6.6	2.5	15.8	16.9
S.E.	2.1	3.1	1.9	1.4	1.9	1.0	4.6	4.9
N	12	12	12	12	12	6	12	12

NA = NOT APPLICABLE

TABLE A8 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 28	0- 13	0- 27
ANIMALS FROM GROUP 5: 900 MG/KG								
82006	30.	21.	13.	21.	26.	NA	34.	80.
82009	30.	-6.	21.	17.	34.	-6.	15.	66.
82010	6.	4.	27.	23.	21.	NA	31.	75.
82018	22.	8.	20.	13.	15.	NA	28.	56.
82028	15.	9.	22.	15.	23.	-8.	32.	70.
82029	19.	5.	18.	28.	14.	NA	22.	65.
82030	9.	6.	11.	18.	21.	NA	17.	56.
82035	21.	2.	26.	9.	20.	NA	28.	57.
82037	30.	-6.	21.	25.	23.	-6.	16.	63.
82040	20.	5.	10.	19.	11.	-1.	16.	45.
82042	17.	-20.	10.	15.	13.	-4.	-10.	17.
82043	12.	7.	23.	16.	14.	-5.	29.	60.
MEAN	19.	3.	19.	18.	19.	-5.	21.	59.
S.D.	8.2	10.1	6.1	5.3	6.5	2.4	12.2	16.2
S.E.	2.4	2.9	1.8	1.5	1.9	1.0	3.5	4.7
N	12	12	12	12	12	6	12	12

NA = NOT APPLICABLE

TABLE A8 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

	MALES							
DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 28	0- 13	0- 27
ANIMALS FROM GROUP 6: 60 MG/KG CYC								
81985	27.	15.	27.	6.	30.	NA	42.	78.
81992	37.	25.	30.	20.	37.	NA	55.	112.
82008	44.	35.	26.	21.	5.	-8.	61.	86.
82026	51.	22.	4.	19.	26.	0.	26.	70.
82033	12.	21.	20.	16.	22.	8.	41.	79.
MEAN	34.	24.	21.	16.	24.	0.	45.	85.
S.D.	15.1	7.5	10.3	6.0	12.1	7.5	13.9	16.1
S.E.	6.7	3.4	4.6	2.7	5.4	4.3	6.2	7.2
N	5	5	5	5	5	3	5	5

NA = NOT APPLICABLE

PJTBWv4.25
01/07/2011

TABLE A9 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

	FEMALES							
DAY	-7	0	7	13	20	27	34	41	48
ANIMALS FROM GROUP 1: SHAM CONTROL									
81924	231.	242.	241.	259.	NA	NA	NA		
81940	249.	266.	287.	300.	NA	NA	NA	NA	
81944	231.	246.	258.	259.	NA	NA	NA	NA	
81952	232.	248.	249.	270.	NA	NA	NA		
81963	220.	226.	240.	247.	NA	NA	NA	NA	
MEAN	233.	246.	255.	267.	NA	NA	NA	NA	
S.D.	10.5	14.4	19.4	20.0					
S.E.	4.7	6.5	8.7	9.0					
N	5	5	5	5					

NA = NOT APPLICABLE

	FEMALES							
DAY -7	0	7	13	20	27	34	41	48
ANIMALS FROM GROUP 2:	0 MG/KG							
81920	233.	241.	247.	263.	NA	NA	NA	NA
81932	220.	235.	239.	237.	NA	NA	NA	
81938	227.	240.	242.	244.	NA	NA	NA	NA
81939	221.	243.	241.	242.	NA	NA	NA	
81942	239.	248.	255.	259.	NA	NA	NA	
81950	219.	219.	233.	234.	NA	NA	NA	NA
81958	232.	251.	266.	278.	NA	NA	NA	
81966	239.	257.	268.	268.	NA	NA	NA	
81967	257.	267.	287.	294.	NA	NA	NA	NA
81971	221.	236.	244.	249.	NA	NA	NA	
81975	238.	255.	254.	266.	NA	NA	NA	
81979	241.	249.	255.	265.	NA	NA	NA	
MEAN	232.	245.	252.	258.	NA	NA	NA	NA
S.D.	11.3	12.4	15.2	18.0				
S.E.	3.3	3.6	4.4	5.2				
N	12	12	12	12				

NA = NOT APPLICABLE

	FEMALES							
DAY	-7	0	7	13	20	27	34	41	48
ANIMALS FROM GROUP 3: 100 MG/KG								
81915	255.	273.	288.	300.	NA	NA	NA	NA	
81916	213.	223.	229.	243.	NA	NA	NA	NA	
81917	237.	245.	234.	236.	NA	NA	NA	NA	
81921	230.	235.	231.	242.	NA	NA	NA	NA	
81926	214.	229.	230.	231.	NA	NA	NA	NA	
81930	235.	231.	237.	236.	NA	NA	NA		
81941	228.	238.	238.	242.	NA	NA	NA		
81960	244.	247.	244.	248.	NA	NA	NA		
81961	252.	261.	265.	276.	NA	NA	NA	NA	
81962	236.	245.	251.	251.	NA	NA	NA	NA	
81972	227.	237.	236.	247.	NA	NA	NA	NA	
81978	241.	264.	274.	279.	NA	NA	NA		
MEAN	234.	244.	246.	252.	NA	NA	NA	NA	
S.D.	13.2	15.1	19.3	21.1					
S.E.	3.8	4.4	5.6	6.1					
N	12	12	12	12					

NA = NOT APPLICABLE

TABLE A9 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

	FEMALES								
DAY	-7	0	7	13	20	27	34	41	48
ANIMALS FROM GROUP 4: 300 MG/KG									
81914	242.	255.	255.	264.	284.	NA	NA	NA	NA
81931	214.	212.	221.	229.	NA	NA	NA	NA	
81934	241.	252.	259.	266.	NA	NA	NA	NA	
81943	240.	250.	244.	253.	NA	NA	NA	NA	
81945	217.	227.	216.	213.	262.	287.	253.	263.	260.
81946	233.	233.	235.	242.	NA	NA	NA	NA	
81947	234.	243.	251.	257.	286.	311.	288.	298.	308.
81957	224.	226.	228.	233.	NA	NA	NA	NA	
81959	244.	261.	259.	269.	NA	NA	NA	NA	
81974	228.	234.	223.	232.	NA	NA	NA	NA	
81976	235.	256.	237.	250.	NA	NA	NA	NA	
81977	245.	253.	254.	253.	NA	NA	NA	NA	
MEAN	233.	242.	240.	247.	278.	299.	271.	280.	284.
S.D.	10.3	15.2	15.7	17.1	13.2	16.7	24.3	24.3	33.7
S.E.	3.0	4.4	4.5	4.9	7.6	11.8	17.2	17.2	23.9
N	12	12	12	12	3	2	2	2	2

NA = NOT APPLICABLE

	FEMALES								
DAY	-7	0	7	13	20	27	34	41	48
ANIMALS FROM GROUP 5: 900 MG/KG									
81918	259.	260.	255.	275.	NA	NA	NA	NA	
81919	231.	248.	239.	240.	NA	NA	NA	NA	
81927	221.	241.	228.	235.	262.	NA	NA	NA	NA
81936	212.	225.	233.	253.	NA	NA	NA	NA	
81937	236.	236.	244.	249.	NA	NA	NA	NA	
81951	223.	244.	255.	259.	NA	NA	NA		
81955	227.	241.	241.	230.	NA	NA	NA		
81964	229.	224.	244.	244.	NA	NA	NA	NA	
81968	242.	254.	248.	258.	NA	NA	NA	NA	
81969	231.	241.	245.	256.	NA	NA	NA	NA	
81973	211.	216.	218.	230.	NA	NA	NA	NA	
81980	232.	259.	248.	247.	NA	NA	NA	NA	
MEAN	230.	241.	241.	248.	262.	NA	NA	NA	NA
S.D.	12.9	13.9	10.9	13.2	0.0				
S.E.	3.7	4.0	3.1	3.8	0.0				
N	12	12	12	12	1				

NA = NOT APPLICABLE

TABLE A9 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

	FEMALES							
DAY -7	0	7	13	20	27	34	41	48
ANIMALS FROM GROUP 6: 60 MG/KG CYC								
81928	219.	233.	243.	241.	NA	NA	NA	
81935	239.	263.	266.	281.	NA	NA	NA	NA
81949	241.	251.	261.	268.	NA	NA	NA	NA
81953	235.	256.	258.	269.	NA	NA	NA	
81970	223.	229.	230.	240.	NA	NA	NA	
MEAN	231.	246.	252.	260.	NA	NA	NA	NA
S.D.	10.2	15.0	14.7	18.5				
S.E.	4.5	6.7	6.6	8.3				
N	5	5	5	5				

NA = NOT APPLICABLE

TABLE A10 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

	FEMALES							
DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 34	34- 41	41- 48	0- 13
ANIMALS FROM GROUP 1: SHAM CONTROL									
81924	11.	-1.	18.	NA	NA	NA			17.
81940	17.	21.	12.	NA	NA	NA	NA		33.
81944	15.	12.	1.	NA	NA	NA	NA		13.
81952	17.	1.	20.	NA	NA	NA			21.
81963	6.	14.	7.	NA	NA	NA	NA		21.
MEAN	13.	9.	12.	NA	NA	NA	NA		21.
S.D.	4.7	9.1	7.8						7.6
S.E.	2.1	4.1	3.5						3.4
N	5	5	5						5

NA = NOT APPLICABLE

TABLE A10 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

	FEMALES								
DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 34	34- 41	41- 48	0- 13
ANIMALS FROM GROUP 2: 0 MG/KG									
81920	8.	6.	16.	NA	NA	NA	NA		22.
81932	15.	4.	-2.	NA	NA	NA			2.
81938	13.	2.	1.	NA	NA	NA	NA		3.
81939	22.	-2.	0.	NA	NA	NA			-2.
81942	9.	7.	5.	NA	NA	NA			11.
81950	0.	15.	1.	NA	NA	NA	NA		15.
81958	19.	15.	12.	NA	NA	NA			27.
81966	18.	11.	0.	NA	NA	NA			11.
81967	10.	21.	7.	NA	NA	NA	NA		28.
81971	16.	7.	6.	NA	NA	NA			13.
81975	17.	-1.	12.	NA	NA	NA			11.
81979	8.	6.	10.	NA	NA	NA			16.
MEAN	13.	7.	6.	NA	NA	NA	NA		13.
S.D.	6.1	6.7	5.9						9.3
S.E.	1.8	1.9	1.7						2.7
N	12	12	12						12

NA = NOT APPLICABLE

FEMALES

DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 34	34- 41	41- 48	0- 13
ANIMALS FROM GROUP 3: 100 MG/KG									
81915	18.	15.	12.	NA	NA	NA	NA		27.
81916	11.	6.	14.	NA	NA	NA	NA		20.
81917	7.	-11.	2.	NA	NA	NA	NA		-9.
81921	5.	-4.	11.	NA	NA	NA	NA		7.
81926	15.	1.	1.	NA	NA	NA	NA		2.
81930	-3.	5.	-1.	NA	NA	NA			4.
81941	11.	0.	4.	NA	NA	NA			4.
81960	3.	-3.	4.	NA	NA	NA			1.
81961	9.	4.	11.	NA	NA	NA	NA		14.
81962	9.	6.	0.	NA	NA	NA	NA		6.
81972	11.	-2.	11.	NA	NA	NA	NA		9.
81978	23.	11.	5.	NA	NA	NA			15.
MEAN	10.	2.	6.	NA	NA	NA	NA		8.
S.D.	6.8	6.9	5.3						9.6
S.E.	2.0	2.0	1.5						2.8
N	12	12	12						12

NA = NOT APPLICABLE

FEMALES

DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 34	34- 41	41- 48	0- 13
ANIMALS FROM GROUP 4: 300 MG/KG									
81914	13.	0.	9.	21.	NA	NA	NA	NA	9.
81931	-2.	9.	8.	NA	NA	NA	NA		17.
81934	11.	6.	7.	NA	NA	NA	NA		14.
81943	10.	-6.	9.	NA	NA	NA	NA		3.
81945	9.	-11.	-3.	49.	25.	-34.	10.	-3.	-13.
81946	0.	2.	7.	NA	NA	NA	NA		9.
81947	10.	8.	6.	29.	25.	-23.	10.	10.	14.
81957	2.	2.	5.	NA	NA	NA	NA		7.
81959	17.	-3.	11.	NA	NA	NA	NA		8.
81974	6.	-12.	10.	NA	NA	NA	NA		-2.
81976	21.	-19.	13.	NA	NA	NA	NA		-6.
81977	8.	1.	-1.	NA	NA	NA	NA		0.
MEAN	9.	-2.	7.	33.	25.	-29.	10.	4.	5.
S.D.	6.7	8.6	4.5	14.7	0.1	7.6	0.0	9.4	8.9
S.E.	1.9	2.5	1.3	8.5	0.1	5.4	0.0	6.7	2.6
N	12	12	12	3	2	2	2	2	12

NA = NOT APPLICABLE

	FEMALES								
DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 34	34- 41	41- 48	0- 13
ANIMALS FROM GROUP 5:	900 MG/KG								
81918	2.	-5.	20.	NA	NA	NA	NA		15.
81919	17.	-9.	1.	NA	NA	NA	NA		-8.
81927	21.	-14.	7.	27.	NA	NA	NA	NA	-6.
81936	13.	9.	20.	NA	NA	NA	NA		28.
81937	0.	8.	5.	NA	NA	NA	NA		13.
81951	21.	11.	4.	NA	NA	NA			15.
81955	14.	0.	-11.	NA	NA	NA			-11.
81964	-5.	20.	0.	NA	NA	NA	NA		20.
81968	12.	-6.	10.	NA	NA	NA	NA		4.
81969	10.	5.	11.	NA	NA	NA	NA		16.
81973	6.	1.	13.	NA	NA	NA	NA		14.
81980	28.	-11.	-2.	NA	NA	NA	NA		-13.
MEAN	11.	1.	7.	27.	NA	NA	NA	NA	7.
S.D.	9.6	10.1	8.9	0.0					13.6
S.E.	2.8	2.9	2.6	0.0					3.9
N	12	12	12	1					12

NA = NOT APPLICABLE

FEMALES

DAY	-7- 0	0- 7	7- 13	13- 20	20- 27	27- 34	34- 41	41- 48	0- 13
ANIMALS FROM GROUP 6: 60 MG/KG CYC									
81928	14.	10.	-2.	NA	NA	NA			8.
81935	24.	3.	16.	NA	NA	NA	NA		18.
81949	10.	9.	7.	NA	NA	NA	NA		17.
81953	21.	2.	11.	NA	NA	NA			13.
81970	6.	1.	10.	NA	NA	NA			11.
MEAN	15.	5.	8.	NA	NA	NA	NA		14.
S.D.	7.5	4.3	6.6						4.0
S.E.	3.4	1.9	2.9						1.8
N	5	5	5						5

NA = NOT APPLICABLE

TABLE A11 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS DURING GESTATION [G]

	PREGNANCY STATUS	DAY 0	4	7	11	14	17	20
DAMS FROM GROUP 1: SHAM CONTROL								
81924	G	259.	269.	296.	311.	324.	357.	403.
81940	G	312.	332.	355.	377.	382.	430.	478.
81944	G	266.	275.	289.	294.	311.	349.	399.
81952	G	261.	278.	299.	321.	342.	370.	422.
81963	G	248.	275.	276.	305.	319.	357.	400.
MEAN		269.	286.	303.	322.	336.	373.	420.
S.D.		24.8	26.0	30.4	32.5	28.3	33.0	33.5
S.E.		11.1	11.6	13.6	14.5	12.7	14.7	15.0
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A11 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS DURING GESTATION [G]

	PREGNANCY STATUS	DAY 0	4	7	11	14	17	20
DAMS FROM GROUP 2: 0 MG/KG								
81920	G	261.	270.	276.	297.	295.	338.	384.
81932	NG	238.	253.	255.	261.	269.	264.	274.
81938	G	248.	262.	277.	308.	320.	354.	404.
81939	G	244.	262.	265.	272.	306.	341.	385.
81942	G	256.	258.	267.	279.	304.	346.	379.
81950	G	229.	228.	238.	262.	273.	295.	334.
81958	G	279.	273.	288.	316.	337.	379.	421.
81966	NG	273.	279.	289.	306.	304.	310.	312.
81967	G	302.	308.	325.	345.	362.	392.	447.
81971	NG	251.	259.	277.	305.	285.	282.	291.
81975	G	276.	269.	290.	306.	316.	347.	394.
81979	G	269.	275.	273.	302.	313.	347.	391.
MEAN		263.	267.	278.	299.	314.	349.	393.
S.D.		21.7	20.8	23.4	25.1	25.2	27.1	30.9
S.E.		7.2	6.9	7.8	8.4	8.4	9.0	10.3
N		9	9	9	9	9	9	9

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

	PREGNANCY STATUS	DAY 0	4	7	11	14	17	20
DAMS FROM GROUP 3: 100 MG/KG								
81915	G	291.	306.	319.	341.	356.	392.	431.
81916	G	241.	250.	265.	278.	278.	308.	343.
81917	G	235.	258.	265.	283.	297.	332.	364.
81921	G	256.	269.	281.	288.	307.	332.	376.
81926	G	233.	244.	259.	270.	280.	309.	347.
81930	G	242.	250.	261.	282.	289.	317.	357.
81941	G	232.	238.	249.	278.	285.	315.	348.
81960	G	252.	262.	262.	296.	314.	344.	367.
81961	G	275.	295.	306.	325.	325.	370.	417.
81962	G	251.	264.	267.	295.	304.	341.	380.
81972	G	242.	246.	265.	283.	294.	321.	373.
81978	G	271.	295.	307.	329.	336.	365.	411.
MEAN		252.	265.	276.	296.	305.	337.	376.
S.D.		18.6	22.4	22.6	23.1	23.8	26.6	29.0
S.E.		5.4	6.5	6.5	6.7	6.9	7.7	8.4
N		12	12	12	12	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

	PREGNANCY STATUS	DAY 0	4	7	11	14	17	20
DAMS FROM GROUP 4: 300 MG/KG								
81914	G	284.	290.	307.	326.	342.	376.	415.
81931	G	237.	240.	250.	266.	270.	303.	336.
81934	G	260.	281.	289.	311.	316.	342.	381.
81943	G	241.	263.	276.	296.	312.	347.	382.
81946	G	242.	256.	260.	277.	285.	306.	341.
81957	G	232.	242.	260.	280.	289.	317.	339.
81959	G	263.	266.	276.	294.	313.	335.	381.
81974	G	224.	229.	249.	269.	277.	304.	336.
81976	G	255.	259.	268.	287.	298.	326.	367.
81977	G	272.	293.	300.	313.	333.	360.	394.
MEAN		251.	262.	274.	292.	304.	332.	367.
S.D.		19.0	21.4	20.1	19.9	23.8	25.0	28.0
S.E.		6.0	6.8	6.3	6.3	7.5	7.9	8.8
N		10	10	10	10	10	10	10

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

	PREGNANCY STATUS	DAY 0	4	7	11	14	17	20
DAMS FROM GROUP 5: 900 MG/KG								
81918	G	286.	307.	321.	337.	357.	385.	417.
81919	G	240.	244.	264.	276.	286.	297.	321.
81927	G	254.	266.	269.	284.	294.	316.	338.
81936	G	244.	261.	273.	284.	296.	314.	355.
81937	G	243.	249.	264.	297.	317.	325.	341.
81951	G	255.	258.	298.	310.	328.	349.	394.
81955	G	226.	245.	241.	259.	262.	294.	320.
81964	G	251.	275.	296.	302.	322.	351.	401.
81968	G	256.	267.	284.	301.	305.	328.	360.
81969	G	250.	266.	274.	292.	306.	326.	361.
81973	G	237.	246.	254.	271.	280.	301.	326.
81980	G	246.	280.	289.	311.	327.	350.	386.
MEAN		249.	264.	277.	294.	307.	328.	360.
S.D.		14.5	18.1	21.7	20.9	25.5	26.8	32.9
S.E.		4.2	5.2	6.3	6.0	7.4	7.7	9.5
N		12	12	12	12	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

	PREGNANCY STATUS	DAY 0	4	7	11	14	17	20
DAMS FROM GROUP 6: 60 MG/KG CYC								
81928	G	236.	242.	261.	273.	293.	315.	352.
81935	G	284.	300.	321.	332.	348.	370.	412.
81949	G	270.	285.	282.	300.	314.	345.	373.
81953	G	263.	282.	287.	308.	311.	340.	380.
81970	G	236.	267.	261.	297.	311.	330.	380.
MEAN		258.	275.	282.	302.	315.	340.	379.
S.D.		21.3	21.9	24.6	21.2	20.0	20.3	21.5
S.E.		9.5	9.8	11.0	9.5	9.0	9.1	9.6
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A12 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES DURING GESTATION [G]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7- 11	11- 14	14- 17	17- 20	0- 20
DAMS FROM GROUP 1: SHAM CONTROL								
81924	G	10.	27.	15.	13.	33.	46.	144.
81940	G	20.	23.	22.	5.	48.	48.	166.
81944	G	9.	14.	5.	17.	38.	50.	133.
81952	G	17.	21.	22.	21.	28.	52.	161.
81963	G	27.	1.	29.	14.	38.	43.	152.
MEAN		17.	17.	19.	14.	37.	48.	151.
S.D.		7.4	10.2	9.1	5.9	7.4	3.5	13.2
S.E.		3.3	4.6	4.1	2.6	3.3	1.6	5.9
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A12 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES DURING GESTATION [G]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7- 11	11- 14	14- 17	17- 20	0- 20
DAMS FROM GROUP 2: 0 MG/KG								
81920	G	9.	6.	21.	-2.	43.	46.	123.
81932	NG	15.	2.	6.	8.	-5.	10.	36.
81938	G	14.	15.	31.	12.	34.	50.	156.
81939	G	18.	3.	7.	34.	35.	44.	141.
81942	G	2.	9.	12.	25.	42.	33.	123.
81950	G	-1.	10.	24.	11.	22.	39.	105.
81958	G	-6.	15.	28.	21.	42.	42.	142.
81966	NG	6.	10.	17.	-2.	6.	2.	39.
81967	G	6.	17.	20.	17.	30.	55.	145.
81971	NG	8.	18.	28.	-20.	-3.	9.	40.
81975	G	-7.	21.	16.	10.	31.	47.	118.
81979	G	6.	-2.	29.	11.	34.	44.	122.
MEAN		5.	10.	21.	15.	35.	44.	131.
S.D.		8.5	7.3	8.1	10.3	6.8	6.3	16.2
S.E.		2.8	2.4	2.7	3.4	2.3	2.1	5.4
N		9	9	9	9	9	9	9

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

	PREGNANCY STATUS	DAY 0- 4	4- 7	7- 11	11- 14	14- 17	17- 20	0- 20
DAMS FROM GROUP 3: 100 MG/KG								
81915	G	15.	13.	22.	15.	36.	39.	140.
81916	G	9.	15.	13.	0.	30.	35.	102.
81917	G	23.	7.	18.	14.	35.	32.	129.
81921	G	13.	12.	7.	19.	25.	44.	120.
81926	G	11.	15.	11.	10.	29.	38.	114.
81930	G	8.	11.	21.	7.	28.	40.	115.
81941	G	6.	11.	29.	7.	30.	33.	116.
81960	G	10.	0.	34.	18.	30.	23.	115.
81961	G	20.	11.	19.	0.	45.	47.	142.
81962	G	13.	3.	28.	9.	37.	39.	129.
81972	G	4.	19.	18.	11.	27.	52.	131.
81978	G	24.	12.	22.	7.	29.	46.	140.
MEAN		13.	11.	20.	10.	32.	39.	124.
S.D.		6.5	5.2	7.7	6.1	5.5	7.8	12.6
S.E.		1.9	1.5	2.2	1.8	1.6	2.2	3.7
N		12	12	12	12	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

PREGNANCY STATUS	DAY	0- 4	4- 7	7- 11	11- 14	14- 17	17- 20	0- 20
DAMS FROM GROUP 4: 300 MG/KG								
81914	G	6.	17.	19.	16.	34.	39.	131.
81931	G	3.	10.	16.	4.	33.	33.	99.
81934	G	21.	8.	22.	5.	26.	39.	121.
81943	G	22.	13.	20.	16.	35.	35.	141.
81946	G	14.	4.	17.	8.	21.	35.	99.
81957	G	10.	18.	20.	9.	28.	22.	107.
81959	G	3.	10.	18.	19.	22.	46.	118.
81974	G	5.	20.	20.	8.	27.	32.	112.
81976	G	4.	9.	19.	11.	28.	41.	112.
81977	G	21.	7.	13.	20.	27.	34.	122.
MEAN		11.	12.	18.	12.	28.	36.	116.
S.D.		8.0	5.2	2.5	5.8	4.7	6.4	13.4
S.E.		2.5	1.7	0.8	1.8	1.5	2.0	4.2
N		10	10	10	10	10	10	10

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A12 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES DURING GESTATION [G]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7- 11	11- 14	14- 17	17- 20	0- 20
DAMS FROM GROUP 5: 900 MG/KG								
81918	G	21.	14.	16.	20.	28.	32.	131.
81919	G	4.	20.	12.	10.	11.	24.	81.
81927	G	12.	3.	15.	10.	22.	22.	84.
81936	G	17.	12.	11.	12.	18.	41.	111.
81937	G	6.	15.	33.	20.	8.	16.	98.
81951	G	3.	40.	12.	18.	21.	45.	139.
81955	G	19.	-4.	18.	3.	32.	26.	94.
81964	G	24.	21.	6.	20.	29.	50.	150.
81968	G	11.	17.	17.	4.	23.	32.	104.
81969	G	16.	8.	18.	14.	20.	35.	111.
81973	G	9.	8.	17.	9.	21.	25.	89.
81980	G	34.	9.	22.	16.	23.	36.	140.
MEAN		15.	14.	16.	13.	21.	32.	111.
S.D.		9.1	10.9	6.7	6.0	6.9	10.0	23.7
S.E.		2.6	3.2	1.9	1.7	2.0	2.9	6.8
N		12	12	12	12	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

PREGNANCY STATUS	DAY	0- 4	4- 7	7- 11	11- 14	14- 17	17- 20	0- 20
DAMS FROM GROUP 6: 60 MG/KG CYC								
81928	G	6.	19.	12.	20.	22.	37.	116.
81935	G	16.	21.	11.	16.	22.	42.	128.
81949	G	15.	-3.	18.	14.	31.	28.	103.
81953	G	19.	5.	21.	3.	29.	40.	117.
81970	G	31.	-6.	36.	14.	19.	50.	144.
MEAN		17.	7.	20.	13.	25.	39.	122.
S.D.		9.0	12.4	10.1	6.3	5.1	8.0	15.3
S.E.		4.0	5.5	4.5	2.8	2.3	3.6	6.9
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A13 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS DURING LACTATION [G]

DAY	0	1	4
DAMS FROM GROUP 1: SHAM CONTROL			
81924	NA	288.	310.
81940	NA	383.	377.
81944	287.	300.	332.
81952	NA	329.	333.
81963	NA	305.	323.
MEAN	287.	321.	335.
S.D.	0.0	37.7	25.2
S.E.	0.0	16.9	11.3
N	1	5	5

NA = NOT APPLICABLE

DAY	0	1	4
DAMS FROM GROUP 2:	0 MG/KG		
81920	NA	300.	305.
81938	NA	319.	327.
81939	296.	298.	315.
81942	283.	287.	319.
81950	270.	270.	264.
81958	315.	320.	338.
81967	NA	336.	340.
81975	NA	311.	313.
81979	NA	293.	297.
MEAN	291.	304.	313.
S.D.	19.2	19.9	23.2
S.E.	9.6	6.6	7.7
N	4	9	9

NA = NOT APPLICABLE

DAY	0	1	4
DAMS FROM GROUP 3:	100 MG/KG		
81915	NA	344.	358.
81916	263.	267.	282.
81917	NA	263.	280.
81921	286.	279.	305.
81926	287.	277.	290.
81930	NA	272.	277.
81941	276.	261.	271.
81960	NA	267.	268.
81961	327.	330.	348.
81962	285.	282.	297.
81972	290.	288.	297.
81978	325.	320.	333.
MEAN	292.	288.	301.
S.D.	22.4	28.0	30.2
S.E.	7.9	8.1	8.7
N	8	12	12

NA = NOT APPLICABLE

DAY	0	1	4
DAMS FROM GROUP 4:	300 MG/KG		
81914	333.	316.	302.
81931	261.	266.	262.
81934	298.	308.	316.
81943	NA	302.	297.
81946	NA	257.	257.
81957	NA	261.	275.
81959	309.	314.	309.
81974	265.	268.	277.
81976	283.	294.	305.
81977	326.	329.	327.
MEAN	296.	292.	293.
S.D.	28.3	26.3	23.6
S.E.	10.7	8.3	7.5
N	7	10	10

NA = NOT APPLICABLE

DAY	0	1	4
DAMS FROM GROUP 5:	900 MG/KG		
81918	330.	329.	329.
81919	NA	256.	270.
81927	261.	257.	272.
81936	264.	269.	266.
81937	NA	317.	310.
81951	306.	292.	NA
81955	NA	248.	267.
81964	NA	272.	NA
81968	NA	270.	287.
81969	NA	288.	304.
81973	260.	272.	268.
81980	NA	299.	318.
MEAN	284.	281.	289.
S.D.	32.0	24.9	24.1
S.E.	14.3	7.2	7.6
N	5	12	10

NA = NOT APPLICABLE

DAY	0	1	4
DAMS FROM GROUP 6:	60 MG/KG CYC		
81928	NA	273.	275.
81935	327.	335.	347.
81949	NA	299.	298.
81953	NA	284.	284.
81970	NA	284.	269.
MEAN	327.	295.	295.
S.D.	0.0	24.2	31.3
S.E.	0.0	10.8	14.0
N	1	5	5

NA = NOT APPLICABLE

DAY	0- 1	1- 4
DAMS FROM GROUP 1:	SHAM CONTROL	
81924	NA	22.
81940	NA	-6.
81944	13.	32.
81952	NA	4.
81963	NA	18.
MEAN	13.	14.
S.D.	0.0	15.0
S.E.	0.0	6.7
N	1	5

NA = NOT APPLICABLE

DAY	0- 1	1- 4
DAMS FROM GROUP 2:	0 MG/KG	
81920	NA	5.
81938	NA	8.
81939	2.	17.
81942	4.	32.
81950	0.	-6.
81958	5.	18.
81967	NA	4.
81975	NA	2.
81979	NA	4.
MEAN	3.	9.
S.D.	2.2	11.3
S.E.	1.1	3.8
N	4	9

NA = NOT APPLICABLE

DAY	0- 1	1- 4
DAMS FROM GROUP 3:	100 MG/KG	
81915	NA	14.
81916	4.	15.
81917	NA	17.
81921	-7.	26.
81926	-10.	13.
81930	NA	5.
81941	-15.	10.
81960	NA	1.
81961	3.	18.
81962	-3.	15.
81972	-2.	9.
81978	-5.	13.
MEAN	-4.	13.
S.D.	6.4	6.4
S.E.	2.3	1.9
N	8	12

NA = NOT APPLICABLE

DAY	0- 1	1- 4
DAMS FROM GROUP 4:	300 MG/KG	
81914	-17.	-14.
81931	5.	-4.
81934	10.	8.
81943	NA	-5.
81946	NA	0.
81957	NA	14.
81959	5.	-5.
81974	3.	9.
81976	11.	11.
81977	3.	-2.
MEAN	3.	1.
S.D.	9.3	8.9
S.E.	3.5	2.8
N	7	10

NA = NOT APPLICABLE

DAY	0- 1	1- 4
DAMS FROM GROUP 5:	900 MG/KG	
81918	-1.	0.
81919	NA	14.
81927	-4.	15.
81936	5.	-3.
81937	NA	-7.
81951	-14.	NA
81955	NA	19.
81968	NA	17.
81969	NA	16.
81973	12.	-4.
81980	NA	19.
MEAN	0.	9.
S.D.	9.8	10.7
S.E.	4.4	3.4
N	5	10

NA = NOT APPLICABLE

DAY	0- 1	1- 4
DAMS FROM GROUP 6:	60 MG/KG CYC	
81928	NA	2.
81935	8.	12.
81949	NA	-1.
81953	NA	0.
81970	NA	-15.
MEAN	8.	0.
S.D.	0.0	9.7
S.E.	0.0	4.3
N	1	5

NA = NOT APPLICABLE

TABLE A15 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

	MALES		
DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 1: SHAM CONTROL			
81983	25.	28.	26.
81990	28.	25.	37.
82004	27.	32.	28.
82012	27.	31.	30.
82017	24.	25.	24.
MEAN	26.	28.	29.
S.D.	1.7	3.3	4.9
S.E.	0.8	1.5	2.2
N	5	5	5

TABLE A15 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALES

DAY -7- 0	0- 7	7- 13
ANIMALS FROM GROUP 2: 0 MG/KG		
81988	23.	20.	17.
81989	21.	16.	16.
81991	28.	21.	17.
81996	21.	16.	15.
81997	27.	18.	17.
81998	26.	21.	29.
82014	33.	22.	22.
82020	27.	22.	21.
82021	24.	16.	16.
82025	26.	23.	18.
82038	29.	22.	18.
82041	25.	22.	17.
MEAN	26.	20.	19.
S.D.	3.5	2.7	4.0
S.E.	1.0	0.8	1.1
N	12	12	12

TABLE A15 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALES

DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 3:	100 MG/KG		
81982	27.	18.	17.
81987	23.	20.	12.
81994	29.	21.	16.
82001	30.	22.	17.
82003	28.	23.	16.
82007	29.	20.	21.
82011	21.	20.	16.
82016	29.	20.	14.
82022	23.	19.	15.
82024	24.	22.	15.
82034	21.	18.	14.
82046	27.	20.	17.
MEAN	26.	20.	16.
S.D.	3.3	1.6	2.2
S.E.	1.0	0.5	0.6
N	12	12	12

TABLE A15 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

	MALES		
DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 4:	300 MG/KG		
81993	21.	13.	15.
81995	25.	18.	14.
82000	25.	21.	16.
82002	27.	20.	13.
82005	26.	25.	19.
82013	24.	20.	15.
82015	25.	19.	16.
82023	28.	20.	15.
82031	25.	24.	14.
82036	28.	24.	16.
82039	24.	19.	14.
82044	27.	17.	13.
MEAN	26.	20.	15.
S.D.	2.0	3.4	1.8
S.E.	0.6	1.0	0.5
N	12	12	12

TABLE A15 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALES

DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 5:	900 MG/KG		
82006	28.	17.	15.
82009	27.	17.	12.
82010	21.	14.	12.
82018	25.	16.	10.
82028	27.	16.	10.
82029	24.	13.	12.
82030	23.	NA	14.
82035	28.	19.	16.
82037	26.	12.	17.
82040	28.	17.	13.
82042	25.	13.	14.
82043	25.	13.	11.
MEAN	26.	15.	13.
S.D.	2.1	2.3	2.2
S.E.	0.6	0.7	0.6
N	12	11	12

NA = NOT APPLICABLE

TABLE A15 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALES

DAY -7- 0	0- 7	7- 13
ANIMALS FROM GROUP 6: 60 MG/KG CYC		
81985 25.	27.	21.
81992 29.	32.	19.
82008 28.	35.	21.
82026 29.	31.	19.
82033 24.	26.	22.
MEAN 27.	30.	20.
S.D. 2.3	3.7	1.3
S.E. 1.0	1.6	0.6
N 5	5	5

PJTFWv4.23
12/09/2010

TABLE A16 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

	MALES		
DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 1: SHAM CONTROL			
81983	66.	69.	63.
81990	69.	60.	83.
82004	72.	79.	66.
82012	70.	78.	70.
82017	65.	65.	59.
MEAN	68.	70.	68.
S.D.	2.9	8.4	9.1
S.E.	1.3	3.8	4.0
N	5	5	5

TABLE A16 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

MALES

DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 2:	0 MG/KG		
81988	62.	52.	42.
81989	61.	44.	42.
81991	69.	48.	37.
81996	62.	48.	43.
81997	68.	44.	39.
81998	67.	51.	66.
82014	78.	47.	45.
82020	70.	54.	50.
82021	64.	41.	38.
82025	67.	56.	42.
82038	76.	53.	41.
82041	64.	55.	39.
MEAN	67.	49.	44.
S.D.	5.3	4.8	7.8
S.E.	1.5	1.4	2.2
N	12	12	12

MALES

DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 3:	100 MG/KG		
81982	67.	43.	41.
81987	65.	54.	32.
81994	77.	54.	39.
82001	75.	52.	38.
82003	70.	52.	34.
82007	72.	49.	47.
82011	55.	49.	38.
82016	71.	45.	29.
82022	60.	48.	37.
82024	67.	58.	39.
82034	60.	50.	36.
82046	69.	49.	39.
MEAN	67.	50.	37.
S.D.	6.4	4.1	4.7
S.E.	1.9	1.2	1.4
N	12	12	12

MALES

DAY -7- 0	0- 7	7- 13
ANIMALS FROM GROUP 4: 300 MG/KG		
81993	62.	37.	44.
81995	71.	48.	35.
82000	69.	53.	36.
82002	68.	47.	29.
82005	67.	61.	43.
82013	65.	51.	38.
82015	68.	48.	39.
82023	72.	48.	34.
82031	64.	57.	32.
82036	70.	55.	34.
82039	63.	47.	34.
82044	69.	40.	29.
MEAN	67.	49.	36.
S.D.	3.2	6.7	4.7
S.E.	0.9	1.9	1.4
N	12	12	12

TABLE A16 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

	MALES		
DAY	-7- 0	0- 7	7- 13
ANIMALS FROM GROUP 5:	900 MG/KG		
82006	69.	40.	34.
82009	68.	42.	27.
82010	58.	37.	31.
82018	66.	41.	23.
82028	72.	40.	24.
82029	65.	35.	32.
82030	64.	NA	37.
82035	72.	49.	38.
82037	73.	32.	43.
82040	70.	41.	30.
82042	66.	34.	37.
82043	72.	38.	31.
MEAN	68.	39.	32.
S.D.	4.4	4.5	6.0
S.E.	1.3	1.3	1.7
N	12	11	12

NA = NOT APPLICABLE

MALES

DAY -7- 0	0- 7	7- 13
ANIMALS FROM GROUP 6: 60 MG/KG CYC		
81985 65.	66.	49.
81992 77.	79.	43.
82008 74.	85.	48.
82026 69.	69.	42.
82033 63.	67.	53.
MEAN 70.	73.	47.
S.D. 5.9	8.3	4.3
S.E. 2.7	3.7	1.9
N 5	5	5

TABLE A17 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 1: SHAM CONTROL							
81924	19.	23.	19.	NA	NA		
81940	22.	24.	22.	NA	NA	NA	
81944	20.	20.	20.	NA	NA	NA	
81952	23.	24.	21.	NA	NA		
81963	18.	22.	17.	NA	NA	NA	
MEAN	20.	23.	20.	NA	NA	NA	
S.D.	2.3	1.8	1.9				
S.E.	1.0	0.8	0.8				
N	5	5	5				

NA = NOT APPLICABLE

TABLE A17 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 2: 0 MG/KG							
81920	18.	22.	14.	NA	NA	NA	
81932	17.	20.	11.	NA	NA		
81938	17.	16.	11.	NA	NA	NA	
81939	19.	17.	12.	NA	NA		
81942	19.	16.	16.	NA	NA		
81950	16.	19.	11.	NA	NA	NA	
81958	20.	16.	17.	NA	NA		
81966	22.	17.	14.	NA	NA		
81967	23.	20.	16.	NA	NA	NA	
81971	19.	15.	16.	NA	NA		
81975	20.	16.	16.	NA	NA		
81979	22.	14.	13.	NA	NA		
MEAN	19.	17.	14.	NA	NA	NA	
S.D.	2.2	2.5	2.3				
S.E.	0.6	0.7	0.7				
N	12	12	12				

NA = NOT APPLICABLE

TABLE A17 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 3:	100 MG/KG						
81915	20.	19.	6.	NA	NA	NA	
81916	18.	16.	11.	NA	NA	NA	
81917	17.	14.	7.	NA	NA	NA	
81921	17.	13.	6.	NA	NA	NA	
81926	18.	13.	8.	NA	NA	NA	
81930	16.	12.	5.	NA	NA		
81941	17.	11.	11.	NA	NA		
81960	17.	15.	7.	NA	NA		
81961	21.	14.	13.	NA	NA	NA	
81962	19.	17.	10.	NA	NA	NA	
81972	18.	11.	6.	NA	NA	NA	
81978	22.	22.	13.	NA	NA		
MEAN	18.	15.	9.	NA	NA	NA	
S.D.	1.8	3.3	3.0				
S.E.	0.5	0.9	0.9				
N	12	12	12				

NA = NOT APPLICABLE

TABLE A17 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 4: 300 MG/KG							
81914	19.	15.	3.	NA	NA	NA	NA
81931	15.	15.	8.	NA	NA	NA	
81934	25.	14.	9.	NA	NA	NA	
81943	19.	12.	5.	NA	NA	NA	
81945	14.	12.	3.	NA	8.	11.	10.
81946	16.	14.	7.	NA	NA	NA	
81947	24.	14.	9.	NA	6.	14.	13.
81957	17.	15.	6.	NA	NA	NA	
81959	19.	15.	8.	NA	NA	NA	
81974	17.	10.	13.	NA	NA	NA	
81976	20.	11.	11.	NA	NA	NA	
81977	19.	11.	9.	NA	NA	NA	
MEAN	19.	13.	8.	NA	7.	12.	11.
S.D.	3.2	1.7	2.9		0.9	2.2	2.3
S.E.	0.9	0.5	0.8		0.6	1.6	1.7
N	12	12	12		2	2	2

NA = NOT APPLICABLE

TABLE A17 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 5: 900 MG/KG							
81918	20.	12.	18.	NA	NA	NA	
81919	19.	10.	8.	NA	NA	NA	
81927	20.	11.	3.	NA	NA	NA	NA
81936	17.	14.	10.	NA	NA	NA	
81937	16.	12.	5.	NA	NA	NA	
81951	24.	16.	14.	NA	NA		
81955	22.	5.	6.	NA	NA		
81964	18.	15.	9.	NA	NA	NA	
81968	20.	8.	8.	NA	NA	NA	
81969	18.	13.	1.	NA	NA	NA	
81973	15.	15.	13.	NA	NA	NA	
81980	23.	20.	12.	NA	NA	NA	
MEAN	19.	12.	9.	NA	NA	NA	NA
S.D.	2.8	4.0	4.8				
S.E.	0.8	1.1	1.4				
N	12	12	12				

NA = NOT APPLICABLE

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 6: 60 MG/KG CYC							
81928	18.	21.	11.	NA	NA		
81935	21.	25.	15.	NA	NA	NA	
81949	19.	21.	13.	NA	NA	NA	
81953	20.	21.	13.	NA	NA		
81970	18.	22.	15.	NA	NA		
MEAN	19.	22.	13.	NA	NA	NA	
S.D.	1.5	2.0	1.8				
S.E.	0.7	0.9	0.8				
N	5	5	5				

NA = NOT APPLICABLE

TABLE A18 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 1: SHAM CONTROL							
81924	80.	94.	74.	NA	NA		
81940	85.	85.	76.	NA	NA	NA	
81944	83.	79.	76.	NA	NA	NA	
81952	98.	98.	79.	NA	NA		
81963	79.	95.	72.	NA	NA	NA	
MEAN	85.	90.	75.	NA	NA	NA	
S.D.	7.5	7.9	2.9				
S.E.	3.4	3.5	1.3				
N	5	5	5				

NA = NOT APPLICABLE

TABLE A18 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 2:	0 MG/KG						
81920	78.	88.	55.	NA	NA	NA	
81932	73.	85.	45.	NA	NA		
81938	72.	65.	44.	NA	NA	NA	
81939	81.	71.	49.	NA	NA		
81942	79.	63.	60.	NA	NA		
81950	73.	85.	48.	NA	NA	NA	
81958	84.	64.	61.	NA	NA		
81966	87.	65.	52.	NA	NA		
81967	88.	73.	56.	NA	NA	NA	
81971	83.	63.	66.	NA	NA		
81975	83.	61.	62.	NA	NA		
81979	91.	54.	49.	NA	NA		
MEAN	81.	70.	54.	NA	NA	NA	
S.D.	6.1	11.0	7.3				
S.E.	1.8	3.2	2.1				
N	12	12	12				

NA = NOT APPLICABLE

TABLE A18 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

	FEMALES					
DAY -7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 3: 100 MG/KG						
81915	75.	69.	19.	NA	NA	NA
81916	81.	69.	47.	NA	NA	NA
81917	71.	56.	29.	NA	NA	NA
81921	74.	57.	24.	NA	NA	NA
81926	80.	55.	34.	NA	NA	NA
81930	70.	53.	21.	NA	NA	
81941	71.	48.	47.	NA	NA	
81960	70.	59.	30.	NA	NA	
81961	83.	52.	50.	NA	NA	NA
81962	78.	68.	41.	NA	NA	NA
81972	76.	47.	25.	NA	NA	NA
81978	87.	81.	47.	NA	NA	
MEAN	76.	60.	34.	NA	NA	NA
S.D.	5.6	10.3	11.4			
S.E.	1.6	3.0	3.3			
N	12	12	12			

NA = NOT APPLICABLE

TABLE A18 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 4:	300 MG/KG						
81914	76.	59.	13.	NA	NA	NA	NA
81931	71.	68.	33.	NA	NA	NA	
81934	100.	53.	34.	NA	NA	NA	
81943	78.	50.	21.	NA	NA	NA	
81945	64.	55.	16.	NA	28.	41.	37.
81946	69.	59.	28.	NA	NA	NA	
81947	102.	55.	34.	NA	21.	47.	43.
81957	77.	65.	24.	NA	NA	NA	
81959	75.	57.	30.	NA	NA	NA	
81974	71.	44.	56.	NA	NA	NA	
81976	81.	46.	46.	NA	NA	NA	
81977	74.	43.	37.	NA	NA	NA	
MEAN	78.	55.	31.	NA	25.	44.	40.
S.D.	11.4	7.9	12.0		5.0	4.0	4.1
S.E.	3.3	2.3	3.5		3.6	2.8	2.9
N	12	12	12		2	2	2

NA = NOT APPLICABLE

TABLE A18 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION [G/KG/DAY]

	FEMALES						
DAY	-7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 5:	900 MG/KG						
81918	78.	45.	67.	NA	NA	NA	
81919	78.	42.	34.	NA	NA	NA	
81927	85.	46.	15.	NA	NA	NA	NA
81936	78.	59.	40.	NA	NA	NA	
81937	69.	48.	22.	NA	NA	NA	
81951	102.	63.	54.	NA	NA		
81955	95.	20.	26.	NA	NA		
81964	79.	62.	36.	NA	NA	NA	
81968	82.	31.	30.	NA	NA	NA	
81969	76.	55.	3.	NA	NA	NA	
81973	70.	67.	59.	NA	NA	NA	
81980	95.	80.	47.	NA	NA	NA	
MEAN	82.	52.	36.	NA	NA	NA	NA
S.D.	10.2	16.4	18.7				
S.E.	3.0	4.7	5.4				
N	12	12	12				

NA = NOT APPLICABLE

FEMALES

DAY -7- 0	0- 7	7- 13	13- 27	27- 34	34- 41	41- 48
ANIMALS FROM GROUP 6: 60 MG/KG CYC						
81928	80.	86.	43.	NA	NA	
81935	85.	96.	55.	NA	NA	NA
81949	77.	81.	48.	NA	NA	NA
81953	81.	82.	50.	NA	NA	
81970	78.	96.	62.	NA	NA	
MEAN	80.	88.	52.	NA	NA	NA
S.D.	3.1	7.3	7.0			
S.E.	1.4	3.2	3.1			
N	5	5	5			

NA = NOT APPLICABLE

TABLE A19 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/ANIMAL/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 1: SHAM CONTROL								
81924	G	18.	20.	20.	22.	21.	22.	20.
81940	G	23.	28.	28.	27.	29.	30.	27.
81944	G	18.	20.	21.	21.	23.	23.	21.
81952	G	20.	26.	24.	26.	23.	25.	24.
81963	G	19.	18.	22.	24.	25.	24.	22.
MEAN		20.	22.	23.	24.	24.	25.	23.
S.D.		2.1	4.3	3.2	2.5	3.0	3.1	2.8
S.E.		0.9	1.9	1.4	1.1	1.4	1.4	1.2
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

	PREGNANCY STATUS	DAY	0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 2: 0 MG/KG									
81920	G		4.	13.	13.	15.	15.	18.	12.
81932	NG		14.	12.	12.	8.	8.	9.	11.
81938	G		13.	14.	15.	16.	17.	20.	16.
81939	G		12.	13.	15.	15.	20.	17.	15.
81942	G		10.	11.	11.	14.	17.	14.	13.
81950	G		8.	11.	11.	11.	13.	15.	11.
81958	G		1.	15.	13.	15.	18.	15.	12.
81966	NG		8.	14.	14.	11.	10.	9.	11.
81967	G		12.	15.	15.	16.	19.	21.	16.
81971	NG		9.	16.	17.	7.	12.	12.	12.
81975	G		10.	12.	10.	15.	18.	17.	13.
81979	G		0.	12.	12.	13.	14.	15.	10.
MEAN			8.	13.	13.	14.	17.	17.	13.
S.D.			4.9	1.5	1.9	1.6	2.3	2.4	2.1
S.E.			1.6	0.5	0.6	0.5	0.8	0.8	0.7
N			9	9	9	9	9	9	9

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A19 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/ANIMAL/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 3: 100 MG/KG								
81915	G	10.	13.	17.	15.	19.	20.	15.
81916	G	12.	13.	13.	13.	15.	13.	13.
81917	G	11.	12.	13.	13.	14.	16.	13.
81921	G	10.	14.	14.	15.	15.	16.	14.
81926	G	10.	13.	12.	12.	15.	15.	13.
81930	G	5.	13.	14.	13.	13.	14.	12.
81941	G	8.	10.	11.	12.	14.	12.	11.
81960	G	12.	15.	13.	16.	18.	11.	14.
81961	G	12.	14.	15.	15.	16.	19.	15.
81962	G	14.	16.	12.	15.	17.	15.	15.
81972	G	10.	13.	12.	11.	15.	16.	12.
81978	G	15.	15.	17.	15.	18.	18.	16.
MEAN		11.	13.	14.	14.	16.	15.	14.
S.D.		2.6	1.6	1.9	1.6	1.9	2.7	1.5
S.E.		0.8	0.5	0.6	0.5	0.5	0.8	0.4
N		12	12	12	12	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A19 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/ANIMAL/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 4: 300 MG/KG								
81914	G	10.	14.	14.	16.	18.	19.	15.
81931	G	9.	12.	13.	12.	13.	11.	12.
81934	G	10.	12.	15.	14.	17.	18.	14.
81943	G	8.	14.	13.	14.	17.	15.	13.
81946	G	11.	12.	13.	12.	13.	12.	12.
81957	G	8.	14.	12.	13.	12.	11.	11.
81959	G	11.	13.	13.	15.	13.	16.	13.
81974	G	10.	12.	14.	13.	14.	14.	13.
81976	G	7.	13.	13.	13.	14.	14.	12.
81977	G	13.	16.	15.	21.	19.	16.	17.
MEAN		10.	13.	14.	14.	15.	15.	13.
S.D.		1.8	1.3	1.0	2.7	2.5	2.8	1.8
S.E.		0.6	0.4	0.3	0.8	0.8	0.9	0.6
N		10	10	10	10	10	10	10

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A19 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/ANIMAL/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 5: 900 MG/KG								
81918	G	13.	17.	18.	21.	18.	18.	18.
81919	G	13.	16.	14.	15.	13.	13.	14.
81927	G	9.	13.	13.	14.	15.	12.	12.
81936	G	11.	NA	13.	NA	14.	15.	13.
81937	G	13.	14.	15.	17.	18.	17.	15.
81951	G	4.	17.	15.	20.	18.	18.	15.
81955	G	7.	12.	14.	7.	18.	11.	11.
81964	G	15.	16.	14.	21.	22.	23.	18.
81968	G	11.	15.	15.	16.	13.	14.	14.
81969	G	13.	14.	14.	17.	17.	17.	15.
81973	G	11.	23.	NA	17.	39.	16.	21.
81980	G	17.	19.	18.	21.	20.	21.	19.
MEAN		11.	16.	15.	17.	19.	16.	15.
S.D.		3.5	3.1	1.7	4.1	6.9	3.5	3.0
S.E.		1.0	0.9	0.5	1.2	2.0	1.0	0.9
N		12	11	11	11	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN
NA = NOT APPLICABLE

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 6: 60 MG/KG CYC								
81928	G	17.	21.	19.	22.	24.	22.	20.
81935	G	20.	24.	23.	24.	23.	24.	23.
81949	G	18.	16.	19.	19.	23.	20.	19.
81953	G	17.	22.	19.	20.	21.	21.	20.
81970	G	20.	22.	22.	23.	22.	24.	22.
MEAN		18.	21.	20.	22.	23.	22.	21.
S.D.		1.5	3.0	1.9	2.1	1.1	1.8	1.6
S.E.		0.7	1.3	0.9	0.9	0.5	0.8	0.7
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A20 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/KG/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 1: SHAM CONTROL								
81924	G	68.	71.	66.	69.	62.	58.	63.
81940	G	71.	81.	77.	71.	71.	66.	71.
81944	G	66.	71.	72.	69.	70.	61.	67.
81952	G	74.	90.	77.	78.	65.	63.	73.
81963	G	73.	65.	76.	77.	74.	63.	71.
MEAN		70.	76.	74.	73.	68.	62.	69.
S.D.		3.4	9.9	4.7	4.4	4.8	2.9	4.0
S.E.		1.5	4.4	2.1	2.0	2.2	1.3	1.8
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A20 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/KG/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 2: 0 MG/KG								
81920	G	15.	48.	45.	51.	47.	50.	40.
81932	NG	57.	47.	47.	30.	30.	33.	42.
81938	G	51.	52.	51.	51.	50.	53.	52.
81939	G	47.	49.	56.	52.	62.	47.	51.
81942	G	39.	42.	40.	48.	52.	39.	44.
81950	G	35.	47.	44.	41.	46.	48.	41.
81958	G	4.	53.	43.	46.	50.	38.	37.
81966	NG	29.	49.	47.	36.	33.	29.	37.
81967	G	39.	47.	45.	45.	50.	50.	45.
81971	NG	35.	60.	58.	24.	42.	42.	43.
81975	G	37.	43.	34.	48.	54.	46.	41.
81979	G	0.	44.	42.	42.	42.	41.	32.
MEAN		30.	47.	44.	47.	50.	46.	43.
S.D.		18.6	3.8	6.3	4.0	5.6	5.3	6.3
S.E.		6.2	1.3	2.1	1.3	1.9	1.8	2.1
N		9	9	9	9	9	9	9

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A20 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/KG/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 3: 100 MG/KG								
81915	G	33.	42.	52.	43.	51.	49.	43.
81916	G	49.	50.	48.	47.	51.	40.	46.
81917	G	45.	46.	47.	45.	44.	46.	45.
81921	G	38.	51.	49.	50.	47.	45.	47.
81926	G	42.	52.	45.	44.	51.	46.	47.
81930	G	20.	51.	51.	45.	43.	42.	42.
81941	G	34.	41.	42.	43.	47.	36.	40.
81960	G	47.	57.	47.	52.	55.	31.	47.
81961	G	42.	47.	47.	46.	46.	48.	45.
81962	G	54.	60.	43.	50.	53.	42.	50.
81972	G	41.	51.	44.	38.	49.	46.	42.
81978	G	53.	50.	53.	45.	51.	46.	48.
MEAN		42.	50.	47.	46.	49.	43.	45.
S.D.		9.5	5.4	3.5	3.8	3.6	5.3	2.9
S.E.		2.7	1.6	1.0	1.1	1.1	1.5	0.8
N		12	12	12	12	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A20 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/KG/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 4: 300 MG/KG								
81914	G	35.	47.	44.	48.	50.	48.	45.
81931	G	38.	49.	50.	45.	45.	34.	44.
81934	G	37.	42.	50.	45.	52.	50.	45.
81943	G	32.	52.	45.	46.	52.	41.	43.
81946	G	44.	47.	48.	43.	44.	37.	43.
81957	G	34.	56.	44.	46.	40.	34.	39.
81959	G	42.	48.	46.	49.	40.	45.	43.
81974	G	44.	50.	54.	48.	48.	44.	48.
81976	G	27.	49.	47.	44.	45.	40.	41.
81977	G	46.	54.	49.	65.	55.	42.	52.
MEAN		38.	49.	48.	48.	47.	42.	44.
S.D.		6.1	3.9	3.2	6.3	5.2	5.5	3.6
S.E.		1.9	1.2	1.0	2.0	1.6	1.7	1.1
N		10	10	10	10	10	10	10

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A20 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING GESTATION [G/KG/DAY]

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 5: 900 MG/KG								
81918	G	44.	54.	55.	61.	49.	45.	52.
81919	G	54.	63.	52.	53.	45.	42.	51.
81927	G	35.	49.	47.	48.	49.	37.	42.
81936	G	43.	NA	47.	NA	46.	45.	45.
81937	G	53.	54.	53.	55.	56.	51.	52.
81951	G	16.	61.	49.	63.	53.	48.	48.
81955	G	30.	49.	56.	27.	65.	36.	42.
81964	G	57.	56.	47.	67.	65.	61.	57.
81968	G	42.	54.	51.	53.	41.	41.	47.
81969	G	50.	52.	49.	57.	54.	49.	51.
81973	G	45.	92.	NA	62.	134.	51.	77.
81980	G	65.	67.	60.	66.	59.	57.	61.
MEAN		45.	59.	51.	56.	60.	47.	52.
S.D.		13.1	12.3	4.3	11.2	24.6	7.5	9.6
S.E.		3.8	3.7	1.3	3.4	7.1	2.2	2.8
N		12	11	11	11	12	12	12

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN
NA = NOT APPLICABLE

	PREGNANCY STATUS	DAY 0- 4	4- 7	7-11	11-14	14-17	17-20	0-20
DAMS FROM GROUP 6: 60 MG/KG CYC								
81928	G	71.	83.	71.	78.	79.	66.	71.
81935	G	68.	77.	70.	71.	64.	61.	68.
81949	G	65.	56.	65.	62.	70.	56.	61.
81953	G	62.	77.	64.	65.	64.	58.	65.
81970	G	79.	83.	79.	76.	69.	68.	74.
MEAN		69.	75.	70.	70.	69.	62.	68.
S.D.		6.5	11.1	6.0	6.9	6.1	5.1	5.1
S.E.		2.9	5.0	2.7	3.1	2.7	2.3	2.3
N		5	5	5	5	5	5	5

G = GRAVID NG = NONGRAVID - WEIGHT(S) NOT INCLUDED IN CALCULATION OF MEAN

TABLE A21 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING LACTATION [G/ANIMAL/DAY]

DAY 1- 4

DAMS FROM GROUP 1:	SHAM CONTROL
81924	30.
81940	32.
81944	38.
81952	28.
81963	26.
MEAN	31.
S.D.	4.6
S.E.	2.1
N	5

DAY 1- 4

DAMS FROM GROUP 2:	0 MG/KG
81920	23.
81938	NA
81939	30.
81942	NA
81950	20.
81958	32.
81967	25.
81975	23.
81979	25.
MEAN	25.
S.D.	4.2
S.E.	1.6
N	7

NA = NOT APPLICABLE

DAY 1- 4

DAMS FROM GROUP 3:	100 MG/KG
81915	25.
81916	36.
81917	26.
81921	30.
81926	31.
81930	19.
81941	21.
81960	19.
81961	NA
81962	32.
81972	24.
81978	26.
MEAN	26.
S.D.	5.5
S.E.	1.7
N	11

NA = NOT APPLICABLE

DAY 1- 4

DAMS FROM GROUP 4:	300 MG/KG
81914	17.
81931	NA
81934	32.
81943	22.
81946	33.
81957	19.
81959	24.
81974	16.
81976	25.
81977	30.
MEAN	24.
S.D.	6.4
S.E.	2.1
N	9

NA = NOT APPLICABLE

DAY 1- 4

DAMS FROM GROUP 5:	900 MG/KG
81918	27.
81919	NA
81927	18.
81936	NA
81937	10.
81951	NA
81955	19.
81964	NA
81968	13.
81969	NA
81973	NA
81980	NA
MEAN	17.
S.D.	6.5
S.E.	2.9
N	5

NA = NOT APPLICABLE

DAY 1- 4

DAMS FROM GROUP 6:	60 MG/KG CYC
81928	25.
81935	33.
81949	24.
81953	21.
81970	22.
MEAN	25.
S.D.	4.7
S.E.	2.1
N	5

TABLE A22 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING LACTATION [G/KG/DAY]

DAY 1- 4

DAMS FROM GROUP 1:	SHAM CONTROL
81924	100.
81940	84.
81944	120.
81952	85.
81963	83.
MEAN	94.
S.D.	15.9
S.E.	7.1
N	5

DAY 1- 4

DAMS FROM GROUP 2:	0 MG/KG
81920	76.
81938	NA
81939	98.
81942	NA
81950	75.
81958	97.
81967	74.
81975	74.
81979	85.
MEAN	83.
S.D.	10.8
S.E.	4.1
N	7

NA = NOT APPLICABLE

DAY 1- 4

DAMS FROM GROUP 3:	100 MG/KG
81915	71.
81916	131.
81917	96.
81921	103.
81926	109.
81930	69.
81941	79.
81960	71.
81961	NA
81962	110.
81972	82.
81978	80.
MEAN	91.
S.D.	20.2
S.E.	6.1
N	11

NA = NOT APPLICABLE

DAY 1- 4

DAMS FROM GROUP 4:	300 MG/KG
81914	55.
81931	NA
81934	103.
81943	73.
81946	128.
81957	71.
81959	77.
81974	59.
81976	83.
81977	91.
MEAN	82.
S.D.	22.7
S.E.	7.6
N	9

NA = NOT APPLICABLE

TABLE A22 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FOOD CONSUMPTION DURING LACTATION [G/KG/DAY]

DAY 1- 4

DAMS FROM GROUP 5:	900 MG/KG
81918	82.
81919	NA
81927	68.
81936	NA
81937	32.
81951	NA
81955	74.
81964	NA
81968	47.
81969	NA
81973	NA
81980	NA
MEAN	61.
S.D.	20.6
S.E.	9.2
N	5

NA = NOT APPLICABLE

DAY 1- 4

DAMS FROM GROUP 6:	60 MG/KG CYC
81928	91.
81935	97.
81949	80.
81953	74.
81970	79.
MEAN	84.
S.D.	9.5
S.E.	4.2
N	5

TABLE A23 (F0 MALES - HOME CAGE OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81988	1	1	1	1	1	1	1
81989	1	1	1	1	1	1	1
81991	1	1	1	1	1	1	1
81996	1	1	1	1	1	1	4
81997	2	1	1	1	1	4	4
81998	1	1	1	1	1	1	4
82014	1	1	1	1	1	1	1
82020	3	1	1	1	1	1	4
82021	1	1	1	1	1	3	4
82025	1	1	1	1	1	1	1
82038	1	1	1	1	1	1	4
82041	1	1	1	1	1	3	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81982	1	1	1	1	1	1	1
81987	1	1	1	1	1	2	4
81994	1	1	1	1	1	1	1
82001	1	1	1	1	1	1	4
82003	1	1	1	1	1	1	4
82007	2	1	1	1	1	4	4
82011	1	1	1	1	1	1	4
82016	1	1	1	1	1	1	1
82022	1	1	1	1	1	1	4
82024	1	1	1	1	1	1	1
82034	2	1	1	1	1	1	4
82046	2	1	1	1	1	4	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A23 (F0 MALES - HOME CAGE OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81993	3	1	1	1	1	1	4
81995	2	1	1	1	1	4	4
82000	2	1	1	1	1	4	1
82002	1	1	1	1	1	1	1
82005	1	1	1	1	1	3	1
82013	1	1	1	1	1	1	4
82015	1	1	1	1	1	1	4
82023	1	1	1	1	1	1	4
82031	3	1	1	1	1	4	4
82036	2	1	1	1	1	3	1
82039	1	1	1	1	1	1	4
82044	2	1	1	1	1	4	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
82006	1	1	1	1	1	1	1
82009	2	1	1	1	1	4	4
82010	2	1	1	1	1	4	4
82018	2	1	1	1	1	4	4
82028	1	1	1	1	1	3	1
82029	1	1	1	1	1	1	4
82030	1	1	1	1	1	1	4
82035	2	1	1	1	1	4	1
82037	1	1	1	1	1	1	1
82040	2	1	1	1	1	4	1
82042	2	1	1	1	1	2	1
82043	1	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A24 (F0 MALES - HOME CAGE OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81988	1	1	1	1	1	1	4
81989	1	1	1	1	1	1	4
81991	1	1	1	1	1	1	4
81996	1	1	1	1	1	1	4
81997	1	1	1	1	1	1	4
81998	1	1	1	1	1	1	4
82014	1	1	1	1	1	1	4
82020	2	1	1	1	1	4	4
82021	8	1	1	1	1	1	1
82025	1	1	1	1	1	1	4
82038	2	1	1	1	1	4	4
82041	1	1	1	1	1	1	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A24 (F0 MALES - HOME CAGE OBSERVATIONS - WEEK 4)

HOME CAGE OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81982	1	1	1	1	1	1	4
81987	2	1	1	1	1	4	4
81994	1	1	1	1	1	1	4
82001	2	1	1	1	1	4	4
82003	2	1	1	1	1	4	4
82007	2	1	1	1	1	4	1
82011	2	1	1	1	1	4	4
82016	1	1	1	1	1	1	4
82022	1	1	1	1	1	1	4
82024	1	1	1	1	1	1	4
82034	2	1	1	1	1	4	4
82046	2	1	1	1	1	4	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81993	1	1	1	1	1	1	4
81995	1	1	1	1	1	1	4
82000	2	1	1	1	1	4	4
82002	1	1	1	1	1	1	1
82005	3	1	1	1	1	1	4
82013	2	1	1	1	1	4	4
82015	1	1	1	1	1	1	4
82023	2	1	1	1	1	4	4
82031	1	1	1	1	1	1	4
82036	8	1	1	1	1	1	4
82039	2	1	1	1	1	4	4
82044	1	1	1	1	1	1	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
82006	1	1	1	1	1	1	1
82009	8	1	1	1	1	1	4
82010	3	1	1	1	1	1	4
82018	1	1	1	1	1	1	4
82028	2	1	1	1	1	4	4
82029	1	1	1	1	1	1	4
82030	2	1	1	1	1	3	4
82035	2	1	1	1	1	4	4
82037	1	1	1	1	1	1	4
82040	2	1	1	1	1	4	4
82042	2	1	1	1	1	4	4
82043	2	1	1	1	1	4	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A25 (F0 FEMALES - HOME CAGE OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81920	3	1	1	1	1	1	4
81932	2	1	1	1	1	4	1
81938	1	1	1	1	1	1	1
81939	1	1	1	1	1	1	4
81942	1	1	1	1	1	1	4
81950	3	1	1	1	1	1	1
81958	1	1	1	1	1	1	1
81966	1	1	1	1	1	1	4
81967	1	1	1	1	1	1	4
81971	1	1	1	1	1	1	4
81975	1	1	1	1	1	1	1
81979	1	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A25 (F0 FEMALES - HOME CAGE OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 2

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG — SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81915	1	1	1	1	1	1	1
81916	1	1	1	1	1	1	4
81917	1	1	1	1	1	1	1
81921	1	1	1	1	1	1	4
81926	2	1	1	1	1	3	4
81930	1	1	1	1	1	1	4
81941	1	1	1	1	1	1	1
81960	1	1	1	1	1	2	4
81961	1	1	1	1	1	1	4
81962	1	1	1	1	1	1	1
81972	2	1	1	1	1	4	4
81978	1	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A25 (F0 FEMALES - HOME CAGE OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 3

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG — SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81914	1	1	1	1	1	1	1
81931	1	1	1	1	1	1	1
81934	1	1	1	1	1	1	1
81943	1	1	1	1	1	1	1
81945	1	1	1	1	1	1	4
81946	1	1	1	1	1	1	1
81947	1	1	1	1	1	1	4
81957	1	1	1	1	1	1	4
81959	1	1	1	1	1	1	4
81974	3	1	1	1	1	1	1
81976	1	1	1	1	1	1	4
81977	3	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81918	1	1	1	1	1	1	1
81919	2	1	1	1	1	4	4
81927	1	1	1	1	1	1	1
81936	1	1	1	1	1	1	1
81937	2	1	1	1	1	4	4
81951	2	1	1	1	1	1	1
81955	3	1	1	1	1	1	1
81964	1	1	1	1	1	1	1
81968	2	1	1	1	1	4	4
81969	1	1	1	1	1	1	1
81973	2	1	1	1	1	4	4
81980	1	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A26 (F0 FEMALES - HOME CAGE OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81920	2	1	1	1	1	3	1
81938	1	1	1	1	1	1	4
81939	1	1	1	1	1	1	4
81942	1	1	1	1	1	1	1
81950	1	1	1	1	1	1	4
81958	1	1	1	1	1	1	4
81967	1	1	1	1	1	1	1
81975	1	1	1	1	1	1	1
81979	1	1	1	1	1	1	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81915	1	1	1	1	1	1	1
81916	1	1	1	1	1	2	4
81917	1	1	1	1	1	2	4
81921	1	1	1	1	1	1	1
81926	1	1	1	1	1	1	1
81930	1	1	1	1	1	1	4
81941	2	1	1	1	1	4	4
81960	2	1	1	1	1	4	4
81961	1	1	1	1	1	1	4
81962	1	1	1	1	1	1	4
81972	1	1	1	1	1	1	4
81978	3	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81914	1	1	1	1	1	1	1
81931	2	1	1	1	1	2	1
81934	1	1	1	1	1	1	1
81943	1	1	1	1	1	1	4
81946	1	1	1	1	1	1	1
81957	1	1	1	1	1	1	1
81959	3	1	1	1	1	1	1
81974	1	1	1	1	1	1	4
81976	3	1	1	1	1	1	1
81977	1	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HOME CAGE OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81918	1	1	1	1	1	1	4
81919	1	1	1	1	1	1	4
81927	1	1	1	1	1	1	1
81936	2	1	1	1	1	4	1
81937	2	1	1	1	1	4	1
81955	1	1	1	1	1	1	4
81968	1	1	1	1	1	1	4
81969	2	1	1	1	1	1	1
81973	1	1	1	1	1	1	4
81980	1	1	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A27 (F0 FEMALES - HOME CAGE OBSERVATIONS - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81932	1	1	1	1	1	1	4
81966	1	1	1	1	1	1	4
81971	1	1	1	1	1	1	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/07/2011

TABLE A28 (F0 FEMALES - HOME CAGE OBSERVATIONS - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG — SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81945	3	1	1	1	1	1	4
81947	1	1	1	1	1	1	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/07/2011

TABLE A29 (F0 FEMALES - HOME CAGE OBSERVATIONS - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HOME CAGE OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG — SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	POSTURE	CONVULSIONS		TREMORS	BITING	PALPEBRAL CLOSURE	FECES CONSISTENCY
		CLONIC	TONIC				
81951	1	1	1	1	1	1	4

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/07/2011

TABLE A30 (F0 MALES - HANDLING OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81988	1	1	1	1	1
81989	1	1	1	1	1
81991	1	1	1	1	1
81996	1	1	1	1	1
81997	1	1	1	1	1
81998	1	1	1	1	1
82014	1	1	1	1	1
82020	1	1	1	1	1
82021	1	1	1	1	1
82025	1	1	1	1	1
82038	1	1	1	1	1
82041	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81988	1	1	1	1	1	2	2	2
81989	1	1	1	1	1	2	2	2
81991	1	1	1	1	1	2	2	2
81996	1	1	1	1	1	2	2	2
81997	1	1	1	1	1	1	2	2
81998	1	1	1	1	1	2	2	2
82014	1	1	1	1	1	2	2	2
82020	1	1	1	1	1	2	2	2
82021	1	1	1	1	1	2	2	2
82025	1	1	1	1	1	2	2	2
82038	1	1	1	1	1	2	2	2
82041	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81988	2	2	2	1	1	1	1	1
81989	2	2	2	1	1	1	1	1
81991	2	2	2	1	1	1	1	1
81996	2	2	2	1	1	1	1	1
81997	2	2	2	1	1	1	1	1
81998	2	2	2	1	1	1	1	1
82014	2	2	2	1	1	1	1	1
82020	2	2	2	1	1	1	1	1
82021	2	2	2	1	1	1	1	1
82025	2	2	2	1	1	1	1	1
82038	2	2	2	1	1	1	1	1
82041	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81982	1	1	1	1	1
81987	1	1	1	1	1
81994	1	1	1	1	1
82001	1	1	1	1	1
82003	1	1	1	1	1
82007	1	1	1	1	1
82011	1	1	1	1	1
82016	1	1	1	1	1
82022	1	1	1	1	1
82024	1	1	1	1	1
82034	1	1	1	1	1
82046	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81982	1	1	1	1	1	2	2	2
81987	1	1	1	1	1	2	2	2
81994	1	1	1	1	1	2	2	2
82001	1	1	1	1	1	2	2	2
82003	1	1	1	1	1	2	2	2
82007	1	1	1	1	1	2	2	2
82011	1	1	1	1	1	2	2	2
82016	1	1	1	1	1	2	2	2
82022	1	1	1	1	1	2	2	2
82024	1	1	1	1	1	2	2	2
82034	1	1	1	1	1	2	2	2
82046	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR				
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81982	2	2	2	1	1	1	1	1
81987	2	2	2	1	1	1	1	1
81994	2	2	2	1	1	1	1	1
82001	2	2	2	1	1	1	1	1
82003	2	2	2	1	1	1	1	1
82007	2	2	2	1	1	1	1	1
82011	2	2	2	1	1	1	1	1
82016	2	2	2	1	1	1	1	1
82022	2	2	2	1	1	1	1	1
82024	2	2	2	1	1	1	1	1
82034	2	2	2	1	1	1	1	1
82046	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81993	1	1	1	1	1
81995	1	1	1	1	1
82000	1	1	1	1	1
82002	1	1	1	1	1
82005	1	1	1	1	1
82013	1	1	1	1	1
82015	1	1	1	1	1
82023	1	1	1	1	1
82031	1	1	1	1	1
82036	1	1	1	1	1
82039	1	2	1	1	1
82044	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81993	1	1	1	1	1	2	2	2
81995	1	1	1	1	1	2	2	2
82000	1	1	1	1	1	2	2	2
82002	1	1	1	1	1	2	2	2
82005	1	1	1	1	1	2	2	2
82013	1	1	1	1	1	2	2	2
82015	1	1	1	1	1	2	2	2
82023	1	1	1	1	1	2	2	2
82031	1	1	1	1	1	2	2	2
82036	1	1	1	1	1	2	2	2
82039	1	1	1	1	1	2	2	2
82044	1	1	1	1	1	1	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81993	2	2	2	1	1	1	1	1
81995	2	2	2	1	1	1	1	1
82000	2	2	2	1	1	1	1	1
82002	2	2	2	1	1	1	1	1
82005	2	2	2	1	1	1	1	1
82013	2	2	2	1	1	1	1	1
82015	2	2	2	1	1	1	1	1
82023	2	2	2	1	1	1	1	1
82031	2	2	2	1	1	1	1	1
82036	2	2	2	1	1	1	1	1
82039	2	2	2	1	1	1	1	1
82044	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
82006	1	1	1	1	1
82009	1	1	1	1	1
82010	1	1	1	1	1
82018	1	1	1	1	1
82028	1	1	1	1	1
82029	1	1	1	1	1
82030	1	1	1	1	1
82035	1	1	1	1	1
82037	1	1	1	1	1
82040	1	1	1	1	1
82042	1	2	1	1	1
82043	1	2*	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
82006	1	1	1	1	1	2	2	2
82009	1	1	1	1	1	2	2	2
82010	1	1	1	1	1	2	2	2
82018	1	1	1	1	1	2	2	2
82028	1	1	1	1	1	2	2	2
82029	1	1	1	1	1	2	2	2
82030	1	1	1	1	1	2	2	2
82035	1	1	1	1	1	2	2	2
82037	1	1	1	1	1	2	2	2
82040	1	1	1	1	1	2	2	2
82042	1	1	1	1	1	2	2	2
82043	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
82006	2	2	2	1	1	1	1	1
82009	2	2	2	1	1	1	1	1
82010	2	2	2	1	1	1	1	1
82018	2	2	2	1	1	1	1	1
82028	2	2	2	1	1	1	1	1
82029	2	2	2	1	1	1	1	1
82030	2	2	2	1	1	1	1	1
82035	2	2	2	1	1	1	1	1
82037	2	2	2	1	1	1	1	1
82040	2	2	2	1	1	1	1	1
82042	2	2	2	1	1	1	1	1
82043	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A31 (F0 MALES - HANDLING OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81988	1	1	1	1	1
81989	1	1	1	1	1
81991	1	1	1	1	1
81996	1	1	1	1	1
81997	1	1	1	1	1
81998	1	1	1	1	1
82014	1	1	1	1	1
82020	1	1	1	1	1
82021	1	1	1	1	1
82025	1	1	1	1	1
82038	1	1	1	1	1
82041	2*	2	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81988	1	1	1	1	1	2	2	2
81989	1	1	1	1	1	2	2	2
81991	1	1	1	1	1	2	2	2
81996	1	1	1	1	1	2	2	2
81997	1	1	1	1	1	2	2	2
81998	1	1	1	1	1	2	2	2
82014	1	1	1	1	1	2	2	2
82020	1	1	1	1	1	2	2	2
82021	1	1	1	1	1	2	2	2
82025	1	1	1	1	1	2	2	2
82038	1	1	1	1	1	2	2	2
82041	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81988	2	2	2	1	1	1	1	1
81989	2	2	2	1	1	1	1	1
81991	2	2	2	1	1	1	1	1
81996	2	2	2	1	1	1	1	1
81997	2	2	2	1	1	1	1	1
81998	2	2	2	1	1	1	1	1
82014	2	2	2	1	1	1	1	1
82020	2	2	2	1	1	1	1	1
82021	2	2	2	1	1	1	1	1
82025	2	2	2	1	1	1	1	1
82038	2	2	2	1	1	1	1	1
82041	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81982	1	1	1	1	1
81987	1	1	1	1	1
81994	1	1	1	1	1
82001	1	1	1	1	1
82003	1	1	1	1	1
82007	1	1	1	1	1
82011	1	1	1	1	1
82016	1	1	1	1	1
82022	1	1	1	1	1
82024	1	1	1	1	1
82034	1	1	1	1	1
82046	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A31 (F0 MALES - HANDLING OBSERVATIONS - WEEK 4)

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81982	1	1	1	1	1	2	2	2
81987	1	1	1	1	1	2	2	2
81994	1	1	1	1	1	2	2	2
82001	1	1	1	1	1	2	2	2
82003	1	1	1	1	1	2	2	2
82007	1	1	1	1	1	2	2	2
82011	1	1	1	1	1	2	2	2
82016	1	1	1	1	1	2	2	2
82022	1	1	1	1	1	2	2	2
82024	1	1	1	1	1	2	2	2
82034	1	1	1	1	1	2	2	2
82046	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81982	2	2	2	1	1	1	1	1
81987	2	2	2	1	1	1	1	1
81994	2	2	2	1	1	1	1	1
82001	2	2	2	1	1	1	1	1
82003	2	2	2	1	1	1	1	1
82007	2	2	2	1	1	1	1	1
82011	2	2	2	1	1	1	1	1
82016	2	2	2	1	1	1	1	1
82022	2	2	2	1	1	1	1	1
82024	2	2	2	1	1	1	1	1
82034	2	2	2	1	1	1	1	1
82046	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81993	1	1	1	1	1
81995	1	1	1	1	1
82000	1	1	1	1	1
82002	1	1	1	1	1
82005	1	1	1	1	1
82013	1	1	1	1	1
82015	1	1	1	1	1
82023	1	1	1	1	1
82031	1	1	1	1	1
82036	1	2	1	1	1
82039	1	1	1	1	1
82044	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A31 (F0 MALES - HANDLING OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81993	1	1	1	1	1	2	2	2
81995	1	1	1	1	1	2	2	2
82000	1	1	1	1	1	2	2	2
82002	1	1	1	1	1	2	2	2
82005	1	1	1	1	1	2	2	2
82013	1	1	1	1	1	2	2	2
82015	1	1	1	1	1	2	2	2
82023	1	1	1	1	1	2	2	2
82031	1	1	1	1	1	2	2	2
82036	1	1	1	1	1	2	2	2
82039	1	1	1	1	1	2	2	2
82044	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81993	2	2	2	1	1	1	1	1
81995	2	2	2	1	1	1	1	1
82000	2	2	2	1	1	1	1	1
82002	2	2	2	1	1	1	1	1
82005	2	2	2	1	1	1	1	1
82013	2	2	2	1	1	1	1	1
82015	2	2	2	1	1	1	1	1
82023	2	2	2	1	1	1	1	1
82031	2	2	2	1	1	1	1	1
82036	2	2	2	1	1	1	1	1
82039	2	2	2	1	1	1	1	1
82044	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
82006	6*	1	1	1	1
82009	1	1	1	1	1
82010	1	1	1	1	1
82018	1	1	1	1	1
82028	1	1	1	1	1
82029	1	1	1	1	1
82030	1	1	1	1	1
82035	1	1	1	1	1
82037	1	1	1	1	1
82040	1	1	1	1	1
82042	1	2	1	1	1
82043	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
82006	1	1	1	1	1	2	2	2
82009	1	1	1	1	1	2	2	2
82010	1	1	1	1	1	2	2	2
82018	1	1	1	1	1	2	2	2
82028	1	1	1	1	1	2	2	2
82029	1	1	1	1	1	2	2	2
82030	1	1	1	1	1	2	2	2
82035	1	1	1	1	1	2	2	2
82037	1	1	1	1	1	2	2	2
82040	1	1	1	1	1	2	2	2
82042	1	1	1	1	1	2	2	2
82043	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
82006	2	2	2	1	1	1	1	1
82009	2	2	2	1	1	1	1	1
82010	2	2	2	1	1	1	1	1
82018	2	2	2	1	1	1	1	1
82028	2	2	2	1	1	1	1	1
82029	2	2	2	1	1	1	1	1
82030	2	2	2	1	1	1	1	1
82035	2	2	2	1	1	1	1	1
82037	2	2	2	1	1	1	1	1
82040	2	2	2	1	1	1	1	1
82042	2	2	2	1	1	1	1	1
82043	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A32 (F0 FEMALES - HANDLING OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81920	1	1	1	1	1
81932	1	1	1	1	1
81938	1	1	1	1	1
81939	1	1	1	1	1
81942	1	1	1	1	1
81950	1	1	1	1	1
81958	1	1	1	1	1
81966	1	1	1	1	1
81967	1	1	1	1	1
81971	1	1	1	1	1
81975	1	1	1	1	1
81979	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81920	1	1	1	1	1	2	2	2
81932	1	1	1	1	1	2	2	2
81938	1	1	1	1	1	2	2	2
81939	1	1	1	1	1	2	2	2
81942	1	1	1	1	1	2	2	2
81950	1	1	1	1	1	2	2	2
81958	1	1	1	1	1	2	2	2
81966	1	1	1	1	1	2	2	2
81967	1	1	1	1	1	2	2	2
81971	1	1	1	1	1	2	2	2
81975	1	1	1	1	1	2	2	2
81979	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR				
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81920	2	2	2	1	1	1	1	1
81932	2	2	2	1	1	1	1	1
81938	2	2	2	1	1	1	1	1
81939	2	2	2	1	1	1	1	1
81942	2	2	2	1	1	1	1	1
81950	2	2	2	1	1	1	1	1
81958	2	2	2	1	1	1	1	1
81966	2	2	2	1	1	1	1	1
81967	2	2	2	1	1	1	1	1
81971	2	2	2	1	1	1	1	1
81975	2	2	2	1	1	1	1	1
81979	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81915	1	1	1	1	1
81916	1	1	1	1	1
81917	1	1	1	1	1
81921	1	1	1	1	1
81926	1	1	1	1	1
81930	2	1	1	1	1
81941	1	1	1	1	1
81960	1	1	1	1	1
81961	1	1	1	1	1
81962	1	1	1	1	1
81972	1	1	1	1	1
81978	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81915	1	1	1	1	1	2	2	2
81916	1	1	1	1	1	2	2	2
81917	1	1	1	1	1	2	2	2
81921	1	1	1	1	1	2	2	2
81926	1	1	1	1	1	2	2	2
81930	1	1	1	1	1	2	2	2
81941	1	1	1	1	1	2	2	2
81960	1	1	1	1	1	2	2	2
81961	1	1	1	1	1	2	2	2
81962	1	1	1	1	1	2	2	2
81972	1	1	1	1	1	2	2	2
81978	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81915	2	2	2	1	1	1	1	1
81916	2	2	2	1	1	1	1	1
81917	2	2	2	1	1	1	1	1
81921	2	2	2	1	1	1	1	1
81926	2	2	2	1	1	1	1	1
81930	2	2	2	1	1	1	1	1
81941	2	2	2	1	1	1	1	1
81960	2	2	2	1	1	1	1	1
81961	2	2	2	1	1	1	1	1
81962	2	2	2	1	1	1	1	1
81972	2	2	2	1	1	1	1	1
81978	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81914	2	1	1	1	1
81931	1	1	1	1	1
81934	1	1	1	1	1
81943	1	1	1	1	1
81945	1	1	1	1	1
81946	1	1	1	1	1
81947	1	1	1	1	1
81957	1	1	1	1	1
81959	1	1	1	1	1
81974	1	1	1	1	1
81976	1	1	1	1	1
81977	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81914	1	1	1	1	1	2	2	2
81931	1	1	1	1	1	2	2	2
81934	1	1	1	1	1	2	2	2
81943	1	1	1	1	1	2	2	2
81945	1	1	1	1	1	2	2	2
81946	1	1	1	1	1	2	2	2
81947	1	1	1	1	1	2	2	2
81957	1	1	1	1	1	2	2	2
81959	1	1	1	1	1	2	2	2
81974	1	1	1	1	1	2	2	2
81976	1	1	1	1	1	2	2	2
81977	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81914	2	2	2	1	1	1	1	1
81931	2	2	2	1	1	1	1	1
81934	2	2	2	1	1	1	1	1
81943	2	2	2	1	1	1	1	1
81945	2	2	2	1	1	1	1	1
81946	2	2	2	1	1	1	1	1
81947	2	2	2	1	1	1	1	1
81957	2	2	2	1	1	1	1	1
81959	2	2	2	1	1	1	1	1
81974	2	2	2	1	1	1	1	1
81976	2	2	2	1	1	1	1	1
81977	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81918	1	1	1	1	1
81919	1	1	1	1	1
81927	1	1	1	1	1
81936	1	1	1	1	1
81937	1	1	1	1	1
81951	1	1	1	1	1
81955	1	1	1	1	1
81964	1	1	1	1	1
81968	1	1	1	1	1
81969	2	1	1	1	1
81973	1	1	1	1	1
81980	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81918	1	1	1	1	1	2	2	2
81919	1	1	1	1	1	2	2	2
81927	1	1	1	1	1	2	2	2
81936	1	1	1	1	1	2	2	2
81937	1	1	1	1	1	2	2	2
81951	1	1	1	1	1	2	2	2
81955	1	1	1	1	1	2	2	2
81964	1	1	1	1	1	2	2	2
81968	1	1	1	1	1	2	2	2
81969	1	1	1	1	1	2	2	2
81973	1	1	1	1	1	2	2	2
81980	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81918	2	2	2	1	1	1	1	1
81919	2	2	2	1	1	1	1	1
81927	2	2	2	1	1	1	1	1
81936	2	2	2	1	1	1	1	1
81937	2	2	2	1	1	1	1	1
81951	2	2	2	1	1	1	1	1
81955	2	2	2	1	1	1	1	1
81964	2	2	2	1	1	1	1	1
81968	2	2	2	1	1	1	1	1
81969	2	2	2	1	1	1	1	1
81973	2	2	2	1	1	1	1	1
81980	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A33 (F0 FEMALES - HANDLING OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81920	1	1	1	1	1
81938	1	1	1	1	1
81939	1	2*	1	1	1
81942	2	1	1	1	1
81950	1	1	1	1	3
81958	1	1	1	1	1
81967	1	1	1	1	1
81975	1	1	1	1	1
81979	1	2	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81920	1	1	1	1	1	2	2	2
81938	1	1	1	1	1	2	2	2
81939	1	1	1	1	1	2	2	2
81942	1	1	1	1	1	2	2	2
81950	1	1	1	1	1	2	2	2
81958	1	1	1	1	1	2	2	2
81967	1	1	1	1	1	2	2	2
81975	1	1	1	1	1	2	2	2
81979	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR				
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81920	2	2	2	1	1	1	1	1
81938	2	2	2	1	1	1	1	1
81939	2	2	2	1	1	1	1	1
81942	2	2	2	1	1	1	1	1
81950	2	2	2	1	1	1	1	1
81958	2	2	2	1	1	1	1	1
81967	2	2	2	1	1	1	1	1
81975	2	2	2	1	1	1	1	1
81979	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81915	1	1	1	1	1
81916	1	1	1	1	1
81917	1	1	1	1	1
81921	2	1	1	1	1
81926	1	1	1	1	1
81930	1	1	1	1	1
81941	2	1	1	1	1
81960	1	1	1	1	1
81961	1	1	1	1	1
81962	1	1	1	1	1
81972	1	1	1	1	1
81978	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81915	1	1	1	1	1	2	2	2
81916	1	1	1	1	1	2	2	2
81917	1	1	1	1	1	2	2	2
81921	1	1	1	1	1	2	2	2
81926	1	1	1	1	1	2	2	2
81930	1	1	1	1	1	2	2	2
81941	1	1	1	1	1	2	2	2
81960	1	1	1	1	1	2	2	2
81961	1	1	1	1	1	2	2	2
81962	1	1	1	1	1	2	2	2
81972	1	1	1	1	1	2	2	2
81978	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81915	2	2	2	1	1	1	1	1
81916	2	2	2	1	1	1	1	1
81917	2	2	2	1	1	1	1	1
81921	2	2	2	1	1	1	1	1
81926	2	2	2	1	1	1	1	1
81930	2	2	2	1	1	1	1	1
81941	2	2	2	1	1	1	1	1
81960	2	2	2	1	1	1	1	1
81961	2	2	2	1	1	1	1	1
81962	2	2	2	1	1	1	1	1
81972	2	2	2	1	1	1	1	1
81978	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81914	1	1	1	1	1
81931	1	1	1	1	1
81934	1	1	1	1	1
81943	1	1	1	1	1
81946	1	1	1	1	1
81957	1	1	1	1	1
81959	1	1	1	1	1
81974	1	1	1	1	1
81976	1	2	1	1	1
81977	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81914	1	1	1	1	1	2	2	2
81931	1	1	1	1	1	2	2	2
81934	1	1	1	1	1	2	2	2
81943	1	1	1	1	1	2	2	2
81946	1	1	1	1	1	2	2	2
81957	1	1	1	1	1	2	1	2
81959	1	1	1	1	1	2	2	2
81974	1	1	1	1	1	2	2	2
81976	1	1	1	1	1	2	2	2
81977	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81914	2	2	2	1	1	1	1	1
81931	2	2	2	1	1	1	1	1
81934	2	2	2	1	1	1	1	1
81943	2	2	2	1	1	1	1	1
81946	2	2	2	1	1	1	1	1
81957	2	1	2	1	1	1	1	1
81959	2	2	2	1	1	1	1	1
81974	2	2	2	1	1	1	1	1
81976	2	2	2	1	1	1	1	1
81977	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81918	2*	1	1	1	1
81919	1	1	1	1	1
81927	1	1	1	1	1
81936	1	1	1	1	1
81937	1	1	1	1	1
81955	1	1	1	1	1
81968	1	1	1	1	1
81969	1	1	1	1	1
81973	1	1	1	1	1
81980	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81918	1	1	1	1	1	2	2	2
81919	1	1	1	1	1	2	2	2
81927	1	1	1	1	1	2	2	2
81936	1	1	1	1	1	2	2	2
81937	1	1	1	1	1	2	2	2
81955	1	1	1	1	1	2	2	2
81968	1	1	1	1	1	2	2	2
81969	1	1	1	1	1	2	2	2
81973	1	1	1	1	1	2	2	2
81980	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81918	2	2	2	1	1	1	1	1
81919	2	2	2	1	1	1	1	1
81927	2	2	2	1	1	1	1	1
81936	2	2	2	1	1	1	1	1
81937	2	2	2	1	1	1	1	1
81955	2	2	2	1	1	1	1	1
81968	2	2	2	1	1	1	1	1
81969	2	2	2	1	1	1	1	1
81973	2	2	2	1	1	1	1	1
81980	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A34 (F0 FEMALES - HANDLING OBSERVATIONS - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81932	1	1	1	1	1
81966	1	1	1	1	1
81971	1	2	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81932	1	1	1	1	1	2	2	2
81966	1	1	1	1	1	2	2	2
81971	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81932	2	2	2	1	1	1	1	1
81966	2	2	2	1	1	1	1	1
81971	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A35 (F0 FEMALES - HANDLING OBSERVATIONS - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81945	2	1	1	1	1
81947	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A35 (F0 FEMALES - HANDLING OBSERVATIONS - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81945	1	1	1	1	1	2	2	2
81947	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL	CRUSTY DEPOSITS			COLOR				
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	EYE PROMINENCE	MUSCLE TONE
81945	2	2	2	1	1	1	1	1
81947	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A36 (F0 FEMALES - HANDLING OBSERVATIONS - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
81951	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
81951	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

HANDLING OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: TLL

ANIMAL	CRUSTY DEPOSITS			COLOR			EYE	MUSCLE
NUMBER	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN	PROMINENCE	TONE
81951	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A37 (F0 MALES - OPEN FIELD OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81988	0.4	1	1	1	1	1	1	3
81989	0.3	1	1	1	1	1	1	3
81991	0.4	1	1	1	1	1	1	3
81996	0.4	1	1	1	1	1	1	3
81997	0.5	1	1	1	1	1	1	3
81998	1.2	1	1	1	1	1	1	1
82014	0.4	1	1	1	1	1	1	3
82020	0.3	1	1	1	1	1	1	3
82021	0.4	1	1	1	1	1	1	3
82025	0.6	1	1	1	1	1	1	1
82038	0.3	1	1	1	1	1	1	3
82041	0.3	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.25							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81988	1	2.0	0.0	0.0	0.0	0.0
81989	1	4.0	0.0	0.0	0.0	0.0
81991	1	3.0	0.0	0.0	0.0	0.0
81996	1	0.0	0.0	0.0	2.0	0.0
81997	1	4.0	0.0	0.0	0.0	0.0
81998	1	1.0	0.0	1.0	1.0	0.0
82014	1	5.0	0.0	0.0	0.0	1.0
82020	1	8.0	0.0	0.0	0.0	1.0
82021	1	4.0	0.0	0.0	0.0	0.0
82025	1	0.0	0.0	0.0	0.0	0.0
82038	1	8.0	0.0	0.0	0.0	0.0
82041	1	2.0	0.0	1.0	0.0	1.0
MEAN		3.4	0.0	0.2	0.3	0.3
S.D.		2.68	0.00	0.39	0.62	0.45
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81982	0.4	1	1	1	1	1	1	3
81987	0.3	1	1	1	1	1	1	3
81994	0.3	1	1	1	1	1	1	3
82001	0.4	1	1	1	1	1	1	2
82003	0.5	1	1	1	1	1	1	3
82007	0.6	1	1	1	1	1	1	3
82011	0.3	1	1	1	1	1	1	3
82016	0.3	1	1	1	1	1	1	3
82022	0.3	1	1	1	1	1	1	3
82024	0.6	1	1	1	1	1	1	3
82034	0.7	1	1	1	1	1	1	3
82046	0.3	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.15							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81982	1	8.0	0.0	1.0	1.0	1.0
81987	1	5.0	0.0	0.0	0.0	0.0
81994	1	3.0	0.0	0.0	3.0	0.0
82001	1	1.0	0.0	0.0	1.0	2.0
82003	1	10.0	0.0	1.0	0.0	0.0
82007	1	2.0	0.0	1.0	0.0	3.0
82011	1	9.0	0.0	2.0	0.0	0.0
82016	1	4.0	0.0	0.0	0.0	0.0
82022	1	4.0	0.0	0.0	0.0	0.0
82024	1	8.0	0.0	0.0	0.0	1.0
82034	1	3.0	0.0	0.0	0.0	1.0
82046	1	4.0	0.0	0.0	0.0	0.0
MEAN		5.1	0.0	0.4	0.4	0.7
S.D.		2.94	0.00	0.67	0.90	0.98
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81993	0.3	1	1	1	1	1	1	3
81995	0.4	1	1	1	1	1	1	3
82000	0.5	1	1	1	1	1	1	3
82002	0.3	1	1	1	1	1	1	3
82005	0.4	1	1	1	1	1	1	3
82013	0.4	1	1	1	1	1	1	3
82015	0.3	1	1	1	1	1	1	3
82023	0.3	1	1	1	1	1	1	1
82031	0.4	1	1	1	1	1	1	3
82036	0.5	1	1	1	1	1	1	3
82039	0.3	1	1	1	1	1	1	3
82044	0.4	1	1	1	1	1	1	2
MEAN	0.4							
S.D.	0.08							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81993	1	5.0	0.0	0.0	1.0	0.0
81995	1	5.0	0.0	0.0	1.0	1.0
82000	1	6.0	0.0	0.0	0.0	0.0
82002	1	8.0	0.0	0.0	0.0	0.0
82005	1	6.0	0.0	0.0	0.0	0.0
82013	1	5.0	0.0	0.0	0.0	0.0
82015	1	6.0	0.0	2.0	1.0	1.0
82023	1	8.0	0.0	1.0	0.0	0.0
82031	1	4.0	0.0	0.0	0.0	0.0
82036	1	2.0	0.0	0.0	0.0	0.0
82039	1	9.0	0.0	0.0	1.0	0.0
82044	1	0.0	0.0	0.0	0.0	0.0
MEAN		5.3	0.0	0.3	0.3	0.2
S.D.		2.53	0.00	0.62	0.49	0.39
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
82006	0.4	1	1	1	1	1	1	3
82009	0.3	1	1	1	1	1	1	3
82010	0.5	1	1	1	1	1	1	3
82018	0.5	1	1	1	1	1	1	3
82028	0.3	1	1	1	1	1	1	3
82029	0.3	1	1	1	1	1	1	3
82030	0.4	1	1	1	1	1	1	3
82035	0.3	1	1	1	1	1	1	3
82037	0.7	1	1	1	1	1	1	3
82040	0.5	1	1	1	1	1	1	3
82042	0.3	1	1	1	1	1	1	3
82043	0.2	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.14							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
82006	1	3.0	0.0	1.0	1.0	0.0
82009	1	3.0	0.0	0.0	0.0	2.0
82010	1	4.0	0.0	0.0	1.0	1.0
82018	1	5.0	0.0	1.0	0.0	0.0
82028	1	2.0	0.0	0.0	0.0	2.0
82029	1	1.0	0.0	0.0	1.0	1.0
82030	1	3.0	0.0	0.0	2.0	2.0
82035	1	4.0	0.0	1.0	2.0	0.0
82037	1	1.0	0.0	0.0	1.0	1.0
82040	1	4.0	0.0	1.0	0.0	0.0
82042	1	3.0	0.0	1.0	0.0	1.0
82043	1	6.0	0.0	0.0	0.0	0.0
MEAN		3.3	0.0	0.4	0.7	0.8
S.D.		1.48	0.00	0.51	0.78	0.83
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A38 (F0 MALES - OPEN FIELD OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81988	0.9	1	1	1	1	1	1	3
81989	0.9	1	1	1	1	1	1	3
81991	0.9	1	1	1	1	1	1	3
81996	0.5	1	1	1	1	1	1	3
81997	0.4	1	1	1	1	1	1	3
81998	0.7	1	1	1	1	1	1	3
82014	0.5	1	1	1	1	1	1	3
82020	0.4	1	1	1	1	1	1	3
82021	0.6	1	1	1	1	1	1	3
82025	0.4	1	1	1	1	1	1	3
82038	0.7	1	1	1	1	1	1	3
82041	0.5	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.20							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81988	1	1.0	0.0	0.0	0.0	0.0
81989	1	3.0	0.0	0.0	0.0	0.0
81991	1	7.0	0.0	1.0	1.0	0.0
81996	1	1.0	0.0	0.0	1.0	0.0
81997	1	2.0	0.0	2.0	0.0	0.0
81998	1	5.0	0.0	0.0	0.0	0.0
82014	1	5.0	0.0	0.0	0.0	0.0
82020	1	5.0	0.0	1.0	0.0	0.0
82021	1	7.0	0.0	0.0	0.0	0.0
82025	1	6.0	0.0	0.0	1.0	0.0
82038	1	7.0	0.0	0.0	0.0	0.0
82041	1	2.0	0.0	1.0	1.0	1.0
MEAN		4.3	0.0	0.4	0.3	0.1
S.D.		2.34	0.00	0.67	0.49	0.29
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
81982	0.6	1	1	1	1	1	1	3
81987	0.9	1	1	1	1	1	1	3
81994	0.6	1	1	1	1	1	1	3
82001	0.5	1	1	1	1	1	1	3
82003	0.3	1	1	1	1	1	1	3
82007	0.5	1	1	1	1	1	1	3
82011	0.5	1	1	1	1	1	1	3
82016	0.5	1	1	1	1	1	1	3
82022	0.6	1	1	1	1	1	1	3
82024	0.6	1	1	1	1	1	1	3
82034	0.3	1	1	1	1	1	1	3
82046	1.1	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.22							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81982	1	7.0	0.0	1.0	1.0	0.0
81987	1	0.0	0.0	0.0	1.0	0.0
81994	1	0.0	0.0	0.0	0.0	0.0
82001	1	5.0	0.0	0.0	1.0	0.0
82003	1	4.0	0.0	0.0	0.0	0.0
82007	1	0.0	0.0	1.0	1.0	0.0
82011	1	7.0	0.0	0.0	0.0	0.0
82016	1	5.0	0.0	0.0	0.0	0.0
82022	1	5.0	0.0	0.0	0.0	0.0
82024	1	0.0	0.0	0.0	0.0	0.0
82034	1	5.0	0.0	0.0	0.0	0.0
82046	1	4.0	0.0	0.0	1.0	0.0
MEAN		3.5	0.0	0.2	0.4	0.0
S.D.		2.75	0.00	0.39	0.51	0.00
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
81993	0.4	1	1	1	1	1	1	3
81995	0.6	1	1	1	1	1	1	3
82000	0.7	1	1	1	1	1	1	3
82002	0.5	1	1	1	1	1	1	3
82005	0.4	1	1	1	1	1	1	3
82013	0.5	1	1	1	1	1	1	3
82015	0.4	1	1	1	1	1	1	3
82023	0.4	1	1	1	1	1	1	3
82031	0.9	1	1	1	1	1	1	3
82036	0.6	1	1	1	1	1	1	3
82039	0.4	1	1	1	1	1	1	3
82044	1.3	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.27							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	BIZARRE/STEREOTYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81993	1	9.0	0.0	0.0	0.0	0.0
81995	1	1.0	0.0	1.0	0.0	0.0
82000	1	1.0	0.0	0.0	0.0	0.0
82002	1	9.0	0.0	0.0	0.0	0.0
82005	1	14.0	0.0	0.0	0.0	0.0
82013	1	0.0	0.0	0.0	1.0	2.0
82015	1	6.0	0.0	0.0	0.0	0.0
82023	1	11.0	0.0	0.0	0.0	0.0
82031	1	7.0	0.0	0.0	1.0	0.0
82036	1	4.0	0.0	0.0	1.0	0.0
82039	1	1.0	0.0	0.0	0.0	0.0
82044	1	0.0	0.0	0.0	1.0	2.0
MEAN		5.3	0.0	0.1	0.3	0.3
S.D.		4.79	0.00	0.29	0.49	0.78
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
82006	0.7	1	1	1	1	1	1	3
82009	0.6	1	1	1	1	1	1	3
82010	0.4	1	1	1	1	1	1	3
82018	0.6	1	1	1	1	1	1	3
82028	0.4	1	1	1	1	1	1	3
82029	0.4	1	1	1	1	1	1	3
82030	0.4	1	1	1	1	1	1	3
82035	0.4	1	1	1	1	1	1	3
82037	0.4	1	1	1	1	1	1	3
82040	0.4	1	1	1	1	1	1	3
82042	0.3	1	1	1	1	1	1	3
82043	0.3	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.12							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
82006	1	10.0	0.0	0.0	1.0	1.0
82009	1	7.0	0.0	0.0	0.0	0.0
82010	1	7.0	0.0	0.0	0.0	0.0
82018	1	8.0	0.0	0.0	0.0	0.0
82028	1	3.0	0.0	0.0	0.0	0.0
82029	1	6.0	0.0	0.0	0.0	0.0
82030	1	4.0	0.0	0.0	0.0	0.0
82035	1	5.0	0.0	1.0	1.0	0.0
82037	1	1.0	0.0	0.0	1.0	1.0
82040	1	7.0	0.0	0.0	0.0	0.0
82042	1	9.0	0.0	1.0	0.0	0.0
82043	1	2.0	0.0	0.0	1.0	5.0
MEAN		5.8	0.0	0.2	0.3	0.6
S.D.		2.80	0.00	0.39	0.49	1.44
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A39 (F0 FEMALES - OPEN FIELD OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81920	0.4	1	1	1	1	1	1	3
81932	0.5	1	1	1	1	1	1	3
81938	0.4	1	1	1	1	1	1	3
81939	0.8	1	1	1	1	1	1	3
81942	0.5	1	1	1	1	1	1	3
81950	0.4	1	1	1	1	1	1	3
81958	0.6	1	1	1	1	1	1	3
81966	0.9	1	1	1	1	1	1	3
81967	0.5	1	1	1	1	1	1	3
81971	0.8	1	1	1	1	1	1	3
81975	0.4	1	1	1	1	1	1	3
81979	0.9	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.20							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81920	1	11.0	0.0	1.0	0.0	0.0
81932	1	6.0	0.0	3.0	1.0	0.0
81938	1	5.0	0.0	1.0	1.0	0.0
81939	1	4.0	2.0	1.0	0.0	0.0
81942	1	4.0	1.0	2.0	1.0	0.0
81950	1	12.0	0.0	1.0	0.0	0.0
81958	1	3.0	0.0	1.0	0.0	0.0
81966	1	9.0	0.0	2.0	1.0	0.0
81967	1	5.0	0.0	2.0	0.0	0.0
81971	1	8.0	0.0	0.0	0.0	0.0
81975	1	5.0	0.0	2.0	1.0	0.0
81979	1	6.0	0.0	1.0	0.0	0.0
MEAN		6.5	0.3	1.4	0.4	0.0
S.D.		2.88	0.62	0.79	0.51	0.00
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
81915	0.7	1	1	1	1	1	1	3
81916	0.9	1	1	1	1	1	1	3
81917	0.5	1	1	1	1	1	1	3
81921	0.4	1	1	1	1	1	1	3
81926	0.6	1	1	1	1	1	1	3
81930	0.4	1	1	1	1	1	1	3
81941	0.6	1	1	1	1	1	1	3
81960	0.8	1	1	1	1	1	1	3
81961	0.6	1	1	1	1	1	1	3
81962	0.5	1	1	1	1	1	1	3
81972	0.4	1	1	1	1	1	1	3
81978	0.9	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.18							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREOTYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81915	1	9.0	0.0	2.0	0.0	0.0
81916	1	3.0	0.0	4.0	1.0	0.0
81917	1	5.0	0.0	2.0	0.0	0.0
81921	1	3.0	0.0	2.0	1.0	1.0
81926	1	5.0	0.0	3.0	1.0	1.0
81930	1	9.0	0.0	0.0	0.0	0.0
81941	1	12.0	0.0	1.0	0.0	0.0
81960	1	5.0	0.0	5.0	1.0	0.0
81961	1	3.0	0.0	2.0	0.0	0.0
81962	1	6.0	0.0	1.0	1.0	0.0
81972	1	9.0	0.0	1.0	0.0	0.0
81978	1	13.0	0.0	1.0	0.0	0.0
MEAN		6.8	0.0	2.0	0.4	0.2
S.D.		3.49	0.00	1.41	0.51	0.39
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A39 (F0 FEMALES - OPEN FIELD OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 5

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG — SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81914	0.5	1	1	1	1	1	1	3
81931	0.6	1	1	1	1	1	1	3
81934	0.6	1	1	1	1	1	1	3
81943	0.5	1	1	1	1	1	1	3
81945	0.4	1	1	1	1	1	1	3
81946	0.4	1	1	1	1	1	1	3
81947	0.7	1	1	1	1	1	1	3
81957	0.3	1	1	1	1	1	1	3
81959	0.5	1	1	1	1	1	1	3
81974	0.5	1	1	1	1	1	1	3
81976	0.4	1	1	1	1	1	1	3
81977	0.7	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.12							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREOTYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81914	1	11.0	0.0	0.0	0.0	0.0
81931	1	4.0	2.0	2.0	0.0	0.0
81934	1	9.0	0.0	0.0	0.0	0.0
81943	1	3.0	0.0	3.0	1.0	1.0
81945	1	8.0	0.0	2.0	0.0	0.0
81946	1	7.0	0.0	0.0	0.0	0.0
81947	1	9.0	0.0	0.0	0.0	0.0
81957	1	2.0	0.0	4.0	0.0	0.0
81959	1	10.0	0.0	3.0	0.0	0.0
81974	1	6.0	0.0	1.0	1.0	0.0
81976	1	11.0	0.0	1.0	1.0	0.0
81977	1	7.0	0.0	0.0	0.0	0.0
MEAN		7.3	0.2	1.3	0.3	0.1
S.D.		3.02	0.58	1.44	0.45	0.29
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
81918	0.8	1	1	1	1	1	1	3
81919	0.4	1	1	1	1	1	1	3
81927	0.6	1	1	1	1	1	1	3
81936	0.5	1	1	1	1	1	1	3
81937	0.3	1	1	1	1	1	1	3
81951	0.7	1	1	1	1	1	1	3
81955	0.7	1	1	1	1	1	1	3
81964	0.5	1	1	1	1	1	1	3
81968	0.7	1	1	1	1	1	1	3
81969	0.7	1	1	1	1	1	1	3
81973	0.9	1	1	1	1	1	1	3
81980	0.5	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.17							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81918	1	3.0	0.0	2.0	0.0	0.0
81919	1	8.0	0.0	1.0	0.0	0.0
81927	1	10.0	0.0	1.0	1.0	0.0
81936	1	10.0	0.0	1.0	1.0	0.0
81937	1	4.0	0.0	2.0	0.0	0.0
81951	1	2.0	0.0	3.0	1.0	1.0
81955	1	14.0	0.0	0.0	0.0	0.0
81964	1	7.0	0.0	1.0	0.0	0.0
81968	1	8.0	0.0	2.0	0.0	0.0
81969	1	6.0	0.0	1.0	1.0	0.0
81973	1	5.0	0.0	2.0	0.0	0.0
81980	1	14.0	0.0	0.0	0.0	0.0
MEAN		7.6	0.0	1.3	0.3	0.1
S.D.		3.92	0.00	0.89	0.49	0.29
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A40 (F0 FEMALES - OPEN FIELD OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81920	0.9	1	1	1	1	1	1	3
81938	0.6	1	1	1	1	1	1	3
81939	0.5	1	1	1	1	1	1	3
81942	0.4	1	1	1	1	1	1	3
81950	0.4	1	1	1	1	1	1	3
81958	0.3	1	1	1	1	1	1	3
81967	0.7	1	1	1	1	1	1	3
81975	0.7	1	1	1	1	1	1	3
81979	0.5	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.19							
N	9							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81920	1	9.0	0.0	0.0	0.0	0.0
81938	1	3.0	0.0	0.0	0.0	0.0
81939	1	3.0	0.0	0.0	1.0	0.0
81942	1	7.0	0.0	2.0	1.0	0.0
81950	1	7.0	0.0	0.0	1.0	0.0
81958	1	1.0	0.0	0.0	2.0	3.0
81967	1	5.0	0.0	0.0	0.0	0.0
81975	1	2.0	0.0	0.0	2.0	2.0
81979	1	6.0	0.0	2.0	0.0	0.0
MEAN		4.8	0.0	0.4	0.8	0.6
S.D.		2.68	0.00	0.88	0.83	1.13
N		9	9	9	9	9

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
81915	0.5	1	1	1	1	1	1	3
81916	0.5	1	1	1	1	1	1	3
81917	0.5	1	1	1	1	1	1	3
81921	0.8	1	1	1	1	1	1	3
81926	0.4	1	1	1	1	1	1	3
81930	0.7	1	1	1	1	1	1	3
81941	0.4	1	1	1	1	1	1	3
81960	0.4	1	1	1	1	1	1	3
81961	0.5	1	1	1	1	1	1	3
81962	0.5	1	1	1	1	1	1	3
81972	0.4	1	1	1	1	1	1	3
81978	0.4	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.13							
N	12							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81915	1	9.0	0.0	1.0	1.0	0.0
81916	1	1.0	0.0	0.0	0.0	0.0
81917	1	3.0	0.0	0.0	0.0	0.0
81921	1	4.0	0.0	1.0	1.0	0.0
81926	1	2.0	0.0	0.0	1.0	3.0
81930	1	5.0	0.0	0.0	1.0	0.0
81941	1	10.0	0.0	0.0	0.0	0.0
81960	1	0.0	0.0	0.0	0.0	0.0
81961	1	12.0	0.0	1.0	0.0	0.0
81962	1	2.0	0.0	0.0	0.0	1.0
81972	1	2.0	0.0	0.0	1.0	0.0
81978	1	4.0	0.0	2.0	0.0	2.0
MEAN		4.5	0.0	0.4	0.4	0.5
S.D.		3.83	0.00	0.67	0.51	1.00
N		12	12	12	12	12

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81914	0.3	1	1	1	1	1	1	3
81931	0.5	1	1	1	1	1	1	3
81934	0.4	1	1	1	1	1	1	3
81943	0.7	1	1	1	1	1	1	3
81946	0.4	1	1	1	1	1	1	3
81957	0.3	1	1	1	1	1	1	3
81959	0.5	1	1	1	1	1	1	3
81974	0.5	1	1	1	1	1	1	3
81976	0.2	1	1	1	1	1	1	3
81977	0.7	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.16							
N	10							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81914	1	18.0	0.0	4.0	1.0	3.0
81931	1	4.0	0.0	0.0	0.0	0.0
81934	1	6.0	0.0	0.0	0.0	0.0
81943	1	1.0	0.0	0.0	1.0	3.0
81946	1	9.0	0.0	1.0	0.0	0.0
81957	1	1.0	0.0	0.0	1.0	0.0
81959	1	21.0	0.0	0.0	0.0	0.0
81974	1	7.0	0.0	0.0	0.0	0.0
81976	1	14.0	0.0	0.0	0.0	0.0
81977	1	3.0	0.0	0.0	0.0	0.0
MEAN		8.4	0.0	0.5	0.3	0.6
S.D.		7.06	0.00	1.27	0.48	1.26
N		10	10	10	10	10

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81918	0.8	1	1	1	1	1	1	3
81919	0.6	1	1	1	1	1	1	3
81927	0.4	1	1	1	1	1	1	3
81936	0.8	1	1	1	1	1	1	3
81937	0.6	1	1	1	1	1	1	3
81955	0.5	1	1	1	1	1	1	3
81968	0.7	1	1	1	1	1	1	3
81969	0.5	1	1	1	1	1	1	3
81973	0.4	1	1	1	1	1	1	3
81980	0.2	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.19							
N	10							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81918	1	1.0	0.0	0.0	1.0	0.0
81919	1	12.0	0.0	0.0	0.0	1.0
81927	1	10.0	0.0	2.0	1.0	0.0
81936	1	5.0	0.0	0.0	3.0	0.0
81937	1	7.0	0.0	0.0	0.0	0.0
81955	1	14.0	0.0	0.0	0.0	0.0
81968	1	2.0	0.0	0.0	1.0	2.0
81969	1	2.0	0.0	0.0	1.0	0.0
81973	1	4.0	0.0	0.0	0.0	0.0
81980	1	14.0	0.0	0.0	0.0	0.0
MEAN		7.1	0.0	0.2	0.7	0.3
S.D.		5.07	0.00	0.63	0.95	0.67
N		10	10	10	10	10

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A41 (F0 FEMALES - OPEN FIELD OBSERVATIONS - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81932	0.4	1	1	1	1	1	1	3
81966	0.8	1	1	1	1	1	1	3
81971	0.4	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.23							
N	3							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81932	1	2.0	0.0	0.0	1.0	0.0
81966	1	1.0	0.0	0.0	0.0	0.0
81971	1	13.0	0.0	0.0	0.0	0.0
MEAN		5.3	0.0	0.0	0.3	0.0
S.D.		6.66	0.00	0.00	0.58	0.00
N		3	3	3	3	3

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A42 (F0 FEMALES - OPEN FIELD OBSERVATIONS - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81945	0.3	1	1	1	1	1	1	3
81947	0.4	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.07							
N	2							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81945	1	16.0	0.0	0.0	0.0	0.0
81947	1	5.0	0.0	1.0	0.0	0.0
MEAN		10.5	0.0	0.5	0.0	0.0
S.D.		7.78	0.00	0.71	0.00	0.00
N		2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A43 (F0 FEMALES - OPEN FIELD OBSERVATIONS - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG — SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS		TREMORS	GAIT SCORE	AROUSAL
				CLONIC	TONIC			
81951	0.7	1	1	1	1	1	1	3
MEAN	0.7							
S.D.	0.00							
N	1							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

OPEN FIELD OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
81951	1	0.0	0.0	0.0	1.0	0.0
MEAN		0.0	0.0	0.0	1.0	0.0
S.D.		0.00	0.00	0.00	0.00	0.00
N		1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A44 (F0 MALES - SENSORY OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81988	2	2	2	2	2
81989	2	2	2	2	2
81991	2	2	2	2	2
81996	2	2	2	1	2
81997	2	2	2	3	2
81998	2	2	2	2	2
82014	2	2	2	2	2
82020	2	2	2	2	2
82021	2	2	2	2	2
82025	2	2	1	2	2
82038	2	2	2	2	2
82041	2	3*	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81988	2	2	2	2	1
81989	2	2	2	2	1
81991	2	2	2	2	1
81996	2	2	2	2	1
81997	2	2	2	2	1
81998	2	2	2	2	1
82014	2	2	2	2	1
82020	2	2	2	2	1
82021	2	2	2	2	1
82025	2	2	2	2	1
82038	2	2	2	2	1
82041	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81982	2	2	2	2	2
81987	2	2	2	3*	2
81994	2	2	1	3*	2
82001	2	2	2	1	2
82003	2	2	2	2	2
82007	2	2	3	2	2
82011	2	2	2	3	2
82016	2	2	2	2	2
82022	2	2	2	2	2
82024	2	2	2	2	2
82034	2	2	2	2	2
82046	2	2	2	1	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81982	2	2	2	2	1
81987	2	2	2	2	1
81994	2	2	2	2	1
82001	2	2	2	2	1
82003	2	2	2	2	1
82007	2	2	2	2	1
82011	2	2	2	2	1
82016	2	2	2	2	1
82022	2	2	2	2	1
82024	2	2	2	2	1
82034	2	2	2	2	1
82046	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81993	2	2	1	2	2
81995	2	2	2	2	2
82000	2	2	2	2	2
82002	2	2	2	2	2
82005	3	2	3	2	2
82013	2	2	1	3*	2
82015	2	2	2	2	2
82023	2	2	2	3*	2
82031	2	2	2	2	2
82036	2	2	2	2	2
82039	2	3	2	2	2
82044	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE A44 (F0 MALES - SENSORY OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81993	2	2	2	2	1
81995	2	2	2	2	1
82000	2	2	2	2	1
82002	2	2	2	2	1
82005	2	2	2	2	1
82013	2	2	2	2	1
82015	2	2	2	2	1
82023	2	2	2	2	1
82031	2	2	2	2	1
82036	2	2	2	2	1
82039	2	2	2	2	1
82044	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
82006	2	2	2	2	2
82009	2	2	2	2	2
82010	2	1	2	2	2
82018	2	2	2	3*	2
82028	2	2	2	2	2
82029	2	2	2	2	2
82030	2	2	2	1	2
82035	2	2	3	3	2
82037	2	2	3	3*	2
82040	2	2	2	2	2
82042	2	2	2	2	2
82043	3*	3*	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
82006	2	2	2	2	1
82009	2	2	2	2	1
82010	2	2	2	2	1
82018	2	2	2	2	1
82028	2	2	2	2	1
82029	2	2	2	2	1
82030	2	2	2	2	1
82035	2	2	2	2	1
82037	2	2	2	2	1
82040	2	2	2	2	1
82042	2	2	2	2	1
82043	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81988	2	2	2	2	2
81989	2	2	2	2	2
81991	2	2	2	2	2
81996	2	2	2	2	2
81997	2	2	2	2	2
81998	2	2	2	2	2
82014	2	2	2	2	2
82020	2	2	2	2	2
82021	2	2	2	2	2
82025	2	2	2	2	2
82038	2	2	2	2	2
82041	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81988	2	2	2	2	1
81989	2	2	2	2	1
81991	2	2	2	2	1
81996	2	2	2	2	1
81997	2	2	2	2	1
81998	2	2	2	2	1
82014	2	2	2	2	1
82020	2	2	2	2	1
82021	2	2	2	2	1
82025	2	2	2	2	1
82038	2	2	2	2	1
82041	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81982	2	2	2	2	2
81987	2	2	2	2	2
81994	2	2	2	2	2
82001	2	2	2	2	2
82003	2	2	2	2	2
82007	2	2	2	2	2
82011	2	2	2	2	2
82016	2	2	2	2	2
82022	2	2	2	2	2
82024	2	2	2	2	2
82034	2	2	2	2	2
82046	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81982	2	2	2	2	1
81987	2	2	2	2	1
81994	2	2	2	2	1
82001	2	2	2	2	1
82003	2	2	2	2	1
82007	2	2	2	2	1
82011	2	2	2	2	1
82016	2	2	2	2	1
82022	2	2	2	2	1
82024	2	2	2	2	1
82034	2	2	2	2	1
82046	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81993	2	2	2	2	2
81995	2	2	2	2	2
82000	2	2	2	2	2
82002	2	2	2	2	2
82005	2	2	2	2	2
82013	2	2	2	2	2
82015	2	2	2	2	2
82023	2	2	2	2	2
82031	2	2	2	2	2
82036	2	2	2	2	2
82039	2	2	2	2	2
82044	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81993	2	2	2	2	1
81995	2	2	2	2	1
82000	2	2	2	2	1
82002	2	2	2	2	1
82005	2	2	2	2	1
82013	2	2	2	2	1
82015	2	2	2	2	1
82023	2	2	2	2	1
82031	2	2	2	2	1
82036	2	2	2	2	1
82039	2	2	2	2	1
82044	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
82006	2	2	2	2	2
82009	2	2	2	2	2
82010	2	2	2	2	2
82018	2	2	2	2	2
82028	2	2	2	2	2
82029	2	2	2	2	2
82030	2	2	2	2	2
82035	2	2	2	2	2
82037	2	2	2	2	2
82040	2	2	2	2	2
82042	2	2	2	2	2
82043	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
82006	2	2	2	2	1
82009	2	2	2	2	1
82010	2	2	2	2	1
82018	2	2	2	2	1
82028	2	2	2	2	1
82029	2	2	2	2	1
82030	2	2	2	2	1
82035	2	2	2	2	1
82037	2	2	2	2	1
82040	2	2	2	2	1
82042	2	2	2	2	1
82043	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A46 (F0 FEMALES - SENSORY OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81920	2	2	2	2	2
81932	2	2	2	2	2
81938	2	2	2	2	2
81939	2	2	2	2	2
81942	2	2	2	2	2
81950	2	2	2	2	2
81958	2	2	2	2	2
81966	2	2	2	2	2
81967	2	2	2	2	2
81971	2	2	2	2	2
81975	2	2	2	2	2
81979	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81920	2	2	2	2	1
81932	2	2	2	2	1
81938	2	2	2	2	1
81939	2	2	2	2	1
81942	2	2	2	2	1
81950	2	2	2	2	1
81958	2	2	2	2	1
81966	2	2	2	2	1
81967	2	2	2	2	1
81971	2	2	2	2	1
81975	2	2	2	2	1
81979	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81915	2	2	2	2	2
81916	2	2	2	2	2
81917	2	2	2	2	2
81921	2	2	2	2	2
81926	1	1	1	1	2
81930	2	2	2	2	2
81941	2	2	2	2	2
81960	2	2	2	2	2
81961	2	2	2	2	2
81962	2	2	2	2	2
81972	2	2	2	2	2
81978	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81915	2	2	2	2	1
81916	2	2	2	2	1
81917	2	2	2	2	1
81921	2	2	2	2	1
81926	2	2	2	2	1
81930	2	2	2	2	1
81941	2	2	2	2	1
81960	2	2	2	2	1
81961	2	2	2	2	1
81962	2	2	2	2	1
81972	2	2	2	2	1
81978	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81914	2	2	2	2	2
81931	2	2	2	2	2
81934	2	2	2	2	2
81943	2	2	2	2	2
81945	2	2	2	2	2
81946	2	2	2	2	2
81947	2	2	2	2	2
81957	2	2	2	2	2
81959	2	2	2	2	2
81974	2	2	2	2	2
81976	2	2	2	2	2
81977	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81914	2	2	2	2	1
81931	2	2	2	2	1
81934	2	2	2	2	1
81943	2	2	2	2	1
81945	2	2	2	2	1
81946	2	2	2	2	1
81947	2	2	2	2	1
81957	2	2	2	2	1
81959	2	2	2	2	1
81974	2	2	2	2	1
81976	2	2	2	2	1
81977	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81918	2	2	2	2	2
81919	2	2	2	2	2
81927	2	2	2	2	2
81936	2	2	2	2	2
81937	2	2	2	2	2
81951	2	2	2	2	2
81955	2	2	2	2	2
81964	2	2	2	1	2
81968	2	2	2	2	2
81969	2	2	2	2	2
81973	2	2	2	2	2
81980	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81918	2	2	2	2	1
81919	2	2	2	2	1
81927	2	2	2	2	1
81936	2	2	2	2	1
81937	2	2	2	2	1
81951	2	2	2	2	1
81955	2	2	2	2	1
81964	2	2	2	2	1
81968	2	2	2	2	1
81969	2	2	2	2	1
81973	2	2	2	2	1
81980	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A47 (F0 FEMALES - SENSORY OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81920	2	2	2	2	2
81938	2	2	2	2	2
81939	2	2	2	2	2
81942	2	2	2	2	2
81950	2	2	2	2	2
81958	2	2	2	2	2
81967	2	2	2	2	2
81975	2	2	2	2	2
81979	3	3	3	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81920	2	2	2	2	1
81938	2	2	2	2	1
81939	2	2	2	2	1
81942	2	2	2	2	1
81950	2	2	2	2	1
81958	2	2	2	2	1
81967	2	2	2	2	1
81975	2	2	2	2	1
81979	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81915	2	2	2	2	2
81916	2	2	2	2	2
81917	2	2	2	2	2
81921	2	2	2	3	2
81926	2	2	2	2	2
81930	2	2	2	2	2
81941	2	2	2	2	2
81960	2	2	2	2	2
81961	2	2	2	2	2
81962	2	2	2	2	2
81972	1	1	2	2	2
81978	2	2	2	3*	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

SENSORY OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81915	2	2	2	2	1
81916	2	2	2	2	1
81917	2	2	2	2	1
81921	2	2	2	2	1
81926	2	2	2	2	1
81930	2	2	2	2	1
81941	2	2	2	2	1
81960	2	2	2	2	1
81961	2	2	2	2	1
81962	2	2	2	2	1
81972	2	2	2	2	1
81978	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81914	2	2	2	3	2
81931	2	2	2	2	2
81934	2	2	2	2	2
81943	2	2	2	2	2
81946	2	2	2	2	2
81957	2	2	2	2	2
81959	2	2	2	2	2
81974	2	2	2	2	2
81976	2	2	2	3	2
81977	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81914	2	2	2	2	1
81931	2	2	2	2	1
81934	2	2	2	2	1
81943	2	2	2	2	1
81946	2	2	2	2	1
81957	2	2	2	2	1
81959	2	2	2	2	1
81974	2	2	2	2	1
81976	2	2	2	2	1
81977	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81918	2	2	2	2	2
81919	2	2	2	2	2
81927	2	2	2	2	2
81936	2	2	2	2	2
81937	2	2	2	2	2
81955	2	2	2	2	2
81968	2	2	2	3*	2
81969	1	2	2	2	2
81973	2	2	2	2	2
81980	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81918	2	2	2	2	1
81919	2	2	2	2	1
81927	2	2	2	2	1
81936	2	2	2	2	1
81937	2	2	2	2	1
81955	2	2	2	2	1
81968	2	2	2	2	1
81969	2	2	2	2	1
81973	2	2	2	2	1
81980	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A48 (F0 FEMALES - SENSORY OBSERVATIONS - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81932	2	2	2	2	2
81966	2	2	2	2	2
81971	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81932	2	2	2	2	1
81966	2	2	2	2	1
81971	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A49 (F0 FEMALES - SENSORY OBSERVATIONS - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG — SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81945	2	2	2	2	2
81947	2	2	2	3	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81945	2	2	2	2	1
81947	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A50 (F0 FEMALES - SENSORY OBSERVATIONS - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	APPROACH RESPONSE	TOUCH RESPONSE	STARTLE RESPONSE	TAIL PINCH RESPONSE	OLFACTORY ORIENTATION
81951	2	2	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

SENSORY OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	PUPIL RESPONSE	EYEBLINK RESPONSE	FORELIMB EXTENSION	HINDLIMB EXTENSION	AIR Rrighting REFLEX
81951	2	2	2	2	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A51 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81988	3	1180.	660.	725.	855.	283.3	155.	485.	860.	500.	352.7
81989	3	940.	185.	175.	433.	438.8	195.	140.	310.	215.	86.7
81991	3	630.	610.	365.	535.	147.6	125.	310.	310.	248.	106.8
81996	3	995.	930.	860.	928.	67.5	235.	245.	295.	258.	32.1
81997	3	1085.	1150.	810.	1015.	180.5	395.	300.	410.	368.	59.7
81998	3	1170.	1055.	1120.	1115.	57.7	515.	420.	470.	468.	47.5
82014	3	540.	320.	465.	442.	111.8	270.	315.	740.	442.	259.3
82020	3	975.	865.	780.	873.	97.8	355.	445.	375.	392.	47.3
82021	3	875.	240.	375.	497.	334.5	370.	115.	510.	332.	200.3
82025	3	1030.	975.	1040.	1015.	35.0	370.	315.	375.	353.	33.3
82038	3	860.	1040.	1150.	1017.	146.4	330.	390.	375.	365.	31.2
82041	3	1070.	665.	490.	742.	297.5	260.	115.	155.	177.	74.9
MEAN					788.9					343.2	
S.D.					250.50					101.80	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81988	120.0	65.	62.	64.	2.1
81989	120.0	60.	68.	64.	5.7
81991	120.0	69.	61.	65.	5.7
81996	28.0	66.	60.	63.	4.2
81997	73.0	110.	102.	106.	5.7
81998	70.0	78.	79.	79.	0.7
82014	7.0	95.	91.	93.	2.8
82020	80.0	73.	62.	68.	7.8
82021	2.0	93.	93.	93.	0.0
82025	13.0	57.	49.	53.	5.7
82038	120.0	82.	77.	80.	3.5
82041	120.0	92.	88.	90.	2.8
MEAN	72.8			76.5	
S.D.	48.73			16.14	
N	12			12	

TABLE A51 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3

DOSE LEVEL: 100 MG/KG SEX: MALES

TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81982	3	260.	980.	580.	607.	360.7	265.	405.	515.	395.	125.3
81987	3	775.	385.	385.	515.	225.2	300.	115.	60.	158.	125.7
81994	3	855.	1085.	1175.	1038.	165.0	375.	385.	340.	367.	23.6
82001	3	990.	985.	875.	950.	65.0	275.	320.	440.	345.	85.3
82003	3	760.	1120.	970.	950.	180.8	205.	265.	320.	263.	57.5
82007	3	985.	550.	875.	803.	226.2	305.	230.	520.	352.	150.5
82011	3	1110.	1030.	1140.	1093.	56.9	465.	340.	450.	418.	68.3
82016	3	795.	150.	200.	382.	358.8	185.	620.	110.	305.	275.4
82022	3	995.	1180.	1115.	1097.	93.9	270.	275.	250.	265.	13.2
82024	3	405.	315.	345.	355.	45.8	175.	195.	365.	245.	104.4
82034	3	810.	655.	785.	750.	83.2	110.	400.	260.	257.	145.0
82046	3	945.	985.	995.	975.	26.5	440.	385.	410.	412.	27.5
MEAN					792.9					315.2	
S.D.					269.59					79.55	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A51 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 4

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG — SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81982	18.0	68.	69.	69.	0.7
81987	120.0	87.	55.	71.	22.6
81994	39.0	72.	74.	73.	1.4
82001	16.0	57.	60.	59.	2.1
82003	3.0	94.	85.	90.	6.4
82007	52.0	60.	72.	66.	8.5
82011	33.0	58.	61.	60.	2.1
82016	6.0	55.	56.	56.	0.7
82022	120.0	86.	66.	76.	14.1
82024	120.0	68.	61.	65.	4.9
82034	21.0	45.	48.	47.	2.1
82046	120.0	86.	82.	84.	2.8
MEAN	55.7			68.0	
S.D.	49.35			11.99	
N	12			12	

TABLE A51 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 5

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4

DOSE LEVEL: 300 MG/KG — SEX: MALES

TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81993	3	810.	1030.	1105.	982.	153.3	215.	240.	270.	242.	27.5
81995	3	795.	1040.	1040.	958.	141.5	295.	450.	385.	377.	77.8
82000	3	330.	175.	80.	195.	126.2	130.	495.	425.	350.	193.7
82002	3	800.	920.	225.	648.	371.5	575.	410.	420.	468.	92.5
82005	3	1030.	800.	590.	807.	220.1	135.	320.	325.	260.	108.3
82013	3	1195.	645.	1305.	1048.	353.6	440.	365.	360.	388.	44.8
82015	3	440.	140.	560.	380.	216.3	120.	100.	445.	222.	193.7
82023	3	935.	630.	675.	747.	164.6	380.	295.	350.	342.	43.1
82031	3	1145.	1110.	1215.	1157.	53.5	500.	420.	500.	473.	46.2
82036	3	1245.	465.	715.	808.	398.3	425.	245.	315.	328.	90.7
82039	3	415.	295.	575.	428.	140.5	460.	565.	200.	408.	187.9
82044	3	1265.	1230.	1260.	1252.	18.9	260.	365.	430.	352.	85.8
MEAN					784.2					350.8	
S.D.					324.06					80.50	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A51 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 6

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG — SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81993	12.0	55.	59.	57.	2.8
81995	120.0	86.	86.	86.	0.0
82000	100.0	71.	92.	82.	14.8
82002	81.0	90.	95.	93.	3.5
82005	62.0	68.	65.	67.	2.1
82013	120.0	90.	91.	91.	0.7
82015	14.0	77.	77.	77.	0.0
82023	31.0	33.	35.	34.	1.4
82031	120.0	79.	63.	71.	11.3
82036	120.0	84.	75.	80.	6.4
82039	120.0	78.	79.	79.	0.7
82044	120.0	79.	72.	76.	4.9
MEAN	85.0			74.4	
S.D.	44.11			16.17	
N	12			12	

TABLE A51 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 7

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG — SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
82006	3	1150.	955.	805.	970.	173.0	315.	400.	295.	337.	55.8
82009	3	660.	1140.	870.	890.	240.6	500.	265.	165.	310.	172.0
82010	3	625.	850.	980.	818.	179.6	225.	195.	275.	232.	40.4
82018	3	865.	1120.	970.	985.	128.2	360.	325.	415.	367.	45.4
82028	3	625.	1100.	250.	658.	426.0	295.	200.	150.	215.	73.7
82029	3	1095.	1190.	1145.	1143.	47.5	395.	450.	335.	393.	57.5
82030	3	1140.	1025.	1205.	1123.	91.2	410.	385.	450.	415.	32.8
82035	3	850.	735.	945.	843.	105.2	300.	320.	370.	330.	36.1
82037	3	1155.	1025.	500.	893.	346.8	400.	185.	270.	285.	108.3
82040	3	935.	695.	1230.	953.	268.0	210.	225.	410.	282.	111.4
82042	3	845.	260.	115.	407.	386.5	375.	180.	110.	222.	137.3
82043	3	870.	540.	240.	550.	315.1	140.	90.	285.	172.	101.3
MEAN					852.8					296.7	
S.D.					219.74					75.96	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
82006	26.0	87.	81.	84.	4.2
82009	120.0	92.	97.	95.	3.5
82010	13.0	69.	77.	73.	5.7
82018	31.0	81.	71.	76.	7.1
82028	120.0	116.	95.	106.	14.8
82029	120.0	67.	56.	62.	7.8
82030	33.0	88.	90.	89.	1.4
82035	2.0	89.	95.	92.	4.2
82037	90.0	73.	71.	72.	1.4
82040	2.0	82.	81.	82.	0.7
82042	30.0	52.	54.	53.	1.4
82043	12.0	72.	80.	76.	5.7
MEAN	49.9			80.0	
S.D.	48.00			14.60	
N	12			12	

TABLE A52 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81988	3	1515.	1580.	485.	1193.	614.3	600.	200.	225.	342.	224.1
81989	3	580.	540.	620.	580.	40.0	325.	235.	265.	275.	45.8
81991	3	380.	845.	240.	488.	316.7	355.	675.	155.	395.	262.3
81996	3	700.	860.	1055.	872.	177.8	115.	105.	605.	275.	285.8
81997	3	180.	1170.	440.	597.	513.3	305.	345.	415.	355.	55.7
81998	3	1300.	1635.	630.	1188.	511.7	615.	635.	465.	572.	92.9
82014	3	175.	470.	365.	337.	149.5	305.	600.	405.	437.	150.0
82020	3	605.	295.	815.	572.	261.6	105.	375.	165.	215.	141.8
82021	3	160.	290.	270.	240.	70.0	275.	140.	165.	193.	71.8
82025	3	160.	235.	180.	192.	38.8	110.	540.	100.	250.	251.2
82038	3	1045.	250.	275.	523.	451.9	670.	350.	285.	435.	206.1
82041	3	265.	1060.	650.	658.	397.6	575.	540.	615.	577.	37.5
MEAN					620.0					360.1	
S.D.					324.01					128.14	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A52 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 2

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81988	26.0	84.	105.	95.	14.8
81989	120.0	47.	47.	47.	0.0
81991	33.0	41.	38.	40.	2.1
81996	96.0	61.	62.	62.	0.7
81997	100.0	106.	104.	105.	1.4
81998	120.0	72.	64.	68.	5.7
82014	1.0	65.	69.	67.	2.8
82020	1.0	50.	57.	54.	4.9
82021	1.0	69.	97.	83.	19.8
82025	39.0	48.	49.	49.	0.7
82038	0.7	61.	67.	64.	4.2
82041	28.0	81.	85.	83.	2.8
MEAN	47.1			68.1	
S.D.	48.07			19.96	
N	12			12	

TABLE A52 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 3

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG — SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81982	3	460.	270.	735.	488.	233.8	410.	535.	455.	467.	63.3
81987	3	1030.	295.	125.	483.	481.0	80.	85.	95.	87.	7.6
81994	3	600.	365.	995.	653.	318.4	270.	380.	635.	428.	187.2
82001	3	1035.	385.	250.	557.	419.7	525.	330.	100.	318.	212.7
82003	3	1215.	840.	470.	842.	372.5	705.	565.	405.	558.	150.1
82007	3	130.	210.	410.	250.	144.2	150.	90.	195.	145.	52.7
82011	3	700.	875.	865.	813.	98.3	400.	495.	260.	385.	118.2
82016	3	115.	155.	200.	157.	42.5	215.	255.	320.	263.	53.0
82022	3	515.	1165.	655.	778.	342.1	620.	430.	395.	482.	121.1
82024	3	320.	785.	340.	482.	262.9	125.	305.	220.	217.	90.0
82034	3	95.	310.	180.	195.	108.3	200.	230.	295.	242.	48.6
82046	3	145.	415.	465.	342.	172.1	385.	540.	400.	442.	85.5
MEAN					503.3					336.2	
S.D.					236.96					146.78	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81982	24.0	60.	56.	58.	2.8
81987	59.0	69.	75.	72.	4.2
81994	31.0	42.	57.	50.	10.6
82001	42.0	52.	60.	56.	5.7
82003	1.0	98.	95.	97.	2.1
82007	82.0	75.	83.	79.	5.7
82011	32.0	60.	62.	61.	1.4
82016	4.0	59.	58.	59.	0.7
82022	14.0	52.	58.	55.	4.2
82024	64.0	82.	76.	79.	4.2
82034	63.0	57.	53.	55.	2.8
82046	0.9	58.	63.	61.	3.5
MEAN	34.7			65.2	
S.D.	27.51			13.78	
N	12			12	

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81993	3	270.	275.	905.	483.	365.2	245.	310.	255.	270.	35.0
81995	3	1080.	1080.	230.	797.	490.7	470.	120.	355.	315.	178.4
82000	3	145.	390.	960.	498.	418.2	170.	365.	375.	303.	115.6
82002	3	140.	390.	120.	217.	150.4	185.	530.	260.	325.	181.5
82005	3	640.	715.	420.	592.	153.3	390.	530.	860.	593.	241.3
82013	3	850.	300.	750.	633.	293.0	360.	340.	475.	392.	72.9
82015	3	280.	180.	230.	230.	50.0	100.	100.	110.	103.	5.8
82023	3	100.	700.	295.	365.	306.1	235.	460.	370.	355.	113.2
82031	3	1365.	940.	560.	955.	402.7	375.	415.	575.	455.	105.8
82036	3	660.	1050.	125.	612.	464.4	430.	540.	770.	580.	173.5
82039	3	305.	1300.	100.	568.	641.9	175.	305.	245.	242.	65.1
82044	3	1870.	1205.	575.	1217.	647.6	500.	555.	195.	417.	193.9
MEAN					597.3					362.5	
S.D.					287.73					138.34	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A52 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 6

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG — SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81993	45.0	71.	78.	75.	4.9
81995	120.0	57.	56.	57.	0.7
82000	1.0	74.	74.	74.	0.0
82002	53.0	84.	87.	86.	2.1
82005	31.0	53.	55.	54.	1.4
82013	46.0	72.	83.	78.	7.8
82015	16.0	63.	77.	70.	9.9
82023	62.0	48.	55.	52.	4.9
82031	29.0	70.	65.	68.	3.5
82036	56.0	77.	74.	76.	2.1
82039	35.0	95.	77.	86.	12.7
82044	80.0	90.	97.	94.	4.9
MEAN	47.8			72.5	
S.D.	30.98			13.17	
N	12			12	

TABLE A52 (F0 MALES - NEUROMUSCULAR OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 7

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5

DOSE LEVEL: 900 MG/KG — SEX: MALES

TEST PERIOD: WEEK 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
82006	3	730.	905.	1035.	890.	153.1	615.	120.	550.	428.	269.0
82009	3	1330.	1375.	1205.	1303.	88.1	365.	365.	310.	347.	31.8
82010	3	170.	120.	185.	158.	34.0	410.	165.	315.	297.	123.5
82018	3	1050.	445.	730.	742.	302.7	315.	320.	250.	295.	39.1
82028	3	165.	480.	115.	253.	197.9	190.	390.	200.	260.	112.7
82029	3	1415.	1135.	165.	905.	656.0	370.	345.	80.	265.	160.7
82030	3	1020.	240.	150.	470.	478.4	320.	395.	400.	372.	44.8
82035	3	415.	350.	950.	572.	329.3	245.	395.	390.	343.	85.2
82037	3	530.	1020.	385.	645.	332.8	115.	305.	405.	275.	147.3
82040	3	205.	460.	1180.	615.	505.6	345.	460.	420.	408.	58.4
82042	3	200.	450.	390.	347.	130.5	335.	350.	245.	310.	56.8
82043	3	510.	710.	955.	725.	222.9	350.	525.	475.	450.	90.1
MEAN					635.4					337.5	
S.D.					315.05					65.02	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
82006	1.0	73.	70.	72.	2.1
82009	48.0	105.	96.	101.	6.4
82010	1.0	75.	77.	76.	1.4
82018	120.0	67.	62.	65.	3.5
82028	95.0	86.	80.	83.	4.2
82029	103.0	74.	73.	74.	0.7
82030	32.0	89.	76.	83.	9.2
82035	1.0	74.	85.	80.	7.8
82037	8.0	87.	87.	87.	0.0
82040	1.0	90.	95.	93.	3.5
82042	3.0	70.	80.	75.	7.1
82043	116.0	94.	104.	99.	7.1
MEAN	44.1			82.3	
S.D.	50.07			11.03	
N	12			12	

FINAL REPORT

Contents:	Volume 5 of 6 (Appendix P [Tables A53-A96])
Study Title:	A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats
Laboratory Project ID:	WIL-402011
Author:	Jeffrey H. Charlap, MS
Test Guideline:	U.S. EPA OPPTS 870.3650 and 870.5395, ICH Guideline S2A and S2B, and OECD Guidelines 422 and 474
Study Completion Date:	30 August 2012
Performing Laboratory:	WIL Research Laboratories, LLC 1407 George Road Ashland, OH 44805-8946
Sponsor:	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
Total Number of Pages:	1897

APPENDIX P

Individual Animal Data (continued)

TABLE A53 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81920	3	560.	760.	900.	740.	170.9	215.	330.	275.	273.	57.5
81932	3	990.	960.	915.	955.	37.7	445.	430.	590.	488.	88.4
81938	3	885.	575.	975.	812.	209.8	400.	445.	500.	448.	50.1
81939	3	770.	685.	680.	712.	50.6	365.	480.	575.	473.	105.2
81942	3	700.	840.	915.	818.	109.1	545.	470.	495.	503.	38.2
81950	3	990.	1065.	1005.	1020.	39.7	475.	345.	575.	465.	115.3
81958	3	995.	315.	800.	703.	350.2	375.	390.	345.	370.	22.9
81966	3	970.	840.	655.	822.	158.3	390.	410.	535.	445.	78.6
81967	3	785.	680.	710.	725.	54.1	430.	560.	515.	502.	66.0
81971	3	645.	730.	775.	717.	66.0	295.	355.	310.	320.	31.2
81975	3	745.	960.	890.	865.	109.7	485.	320.	395.	400.	82.6
81979	3	780.	830.	620.	743.	109.7	280.	280.	340.	300.	34.6
MEAN					802.7					415.6	
S.D.					101.82					81.55	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81920	120.0	32.	27.	30.	3.5
81932	21.0	87.	85.	86.	1.4
81938	11.0	29.	34.	32.	3.5
81939	120.0	80.	86.	83.	4.2
81942	14.0	89.	104.	97.	10.6
81950	63.0	65.	72.	69.	4.9
81958	120.0	61.	68.	65.	4.9
81966	23.0	43.	48.	46.	3.5
81967	26.0	75.	75.	75.	0.0
81971	24.0	79.	62.	71.	12.0
81975	13.0	83.	80.	82.	2.1
81979	22.0	35.	33.	34.	1.4
MEAN	48.1			64.2	
S.D.	45.34			23.08	
N	12			12	

TABLE A53 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81915	3	920.	865.	675.	820.	128.5	365.	395.	455.	405.	45.8
81916	3	650.	685.	610.	648.	37.5	220.	375.	440.	345.	113.0
81917	3	830.	625.	780.	745.	106.9	350.	280.	475.	368.	98.8
81921	3	655.	795.	745.	732.	70.9	205.	590.	455.	417.	195.3
81926	3	390.	270.	585.	415.	159.0	455.	465.	420.	447.	23.6
81930	3	730.	640.	115.	495.	332.2	365.	325.	370.	353.	24.7
81941	3	1095.	830.	130.	685.	498.6	350.	280.	340.	323.	37.9
81960	3	655.	785.	925.	788.	135.0	330.	450.	545.	442.	107.7
81961	3	1020.	865.	805.	897.	110.9	435.	460.	630.	508.	106.1
81962	3	1115.	940.	845.	967.	137.0	590.	415.	410.	472.	102.5
81972	3	895.	700.	780.	792.	98.0	410.	250.	300.	320.	81.9
81978	3	800.	785.	970.	852.	102.8	380.	485.	490.	452.	62.1
MEAN					736.3					404.3	
S.D.					158.74					61.94	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A53 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 4

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG — SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81915	25.0	57.	74.	66.	12.0
81916	13.0	12.	13.	13.	0.7
81917	120.0	75.	85.	80.	7.1
81921	120.0	32.	33.	33.	0.7
81926	23.0	73.	74.	74.	0.7
81930	28.0	28.	32.	30.	2.8
81941	79.0	54.	51.	53.	2.1
81960	17.0	37.	44.	41.	4.9
81961	32.0	41.	51.	46.	7.1
81962	11.0	32.	35.	34.	2.1
81972	120.0	60.	71.	66.	7.8
81978	77.0	76.	93.	85.	12.0
MEAN	55.4			51.8	
S.D.	44.78			22.56	
N	12			12	

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81914	3	580.	900.	805.	762.	164.3	465.	465.	550.	493.	49.1
81931	3	860.	365.	575.	600.	248.4	425.	320.	480.	408.	81.3
81934	3	950.	890.	755.	865.	99.9	450.	390.	430.	423.	30.6
81943	3	1205.	975.	995.	1058.	127.4	490.	595.	595.	560.	60.6
81945	3	490.	805.	660.	652.	157.7	225.	365.	375.	322.	83.9
81946	3	545.	770.	900.	738.	179.6	280.	260.	500.	347.	133.2
81947	3	1030.	790.	680.	833.	179.0	315.	200.	165.	227.	78.5
81957	3	945.	800.	775.	840.	91.8	250.	335.	280.	288.	43.1
81959	3	525.	550.	520.	532.	16.1	495.	500.	425.	473.	41.9
81974	3	900.	790.	870.	853.	56.9	480.	310.	345.	378.	89.8
81976	3	630.	700.	685.	672.	36.9	395.	200.	520.	372.	161.3
81977	3	645.	550.	710.	635.	80.5	355.	320.	480.	385.	84.1
MEAN					753.3					389.7	
S.D.					145.47					91.33	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81914	9.0	40.	37.	39.	2.1
81931	83.0	64.	72.	68.	5.7
81934	120.0	93.	91.	92.	1.4
81943	120.0	80.	93.	87.	9.2
81945	55.0	33.	35.	34.	1.4
81946	120.0	35.	52.	44.	12.0
81947	120.0	65.	79.	72.	9.9
81957	120.0	43.	52.	48.	6.4
81959	16.0	30.	32.	31.	1.4
81974	120.0	67.	68.	68.	0.7
81976	36.0	33.	29.	31.	2.8
81977	120.0	14.	11.	13.	2.1
MEAN	86.6			52.3	
S.D.	45.11			24.70	
N	12			12	

TABLE A53 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 7

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5

DOSE LEVEL: 900 MG/KG — SEX: FEMALES

TEST PERIOD: PRETEST

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81918	3	875.	1015.	930.	940.	70.5	410.	505.	520.	478.	59.7
81919	3	890.	910.	840.	880.	36.1	435.	475.	680.	530.	131.4
81927	3	180.	495.	425.	367.	165.4	255.	405.	385.	348.	81.4
81936	3	810.	835.	710.	785.	66.1	425.	270.	340.	345.	77.6
81937	3	955.	760.	690.	802.	137.3	390.	225.	315.	310.	82.6
81951	3	825.	985.	845.	885.	87.2	460.	340.	570.	457.	115.0
81955	3	415.	685.	845.	648.	217.3	385.	380.	380.	382.	2.9
81964	3	435.	455.	495.	462.	30.6	175.	440.	355.	323.	135.3
81968	3	800.	795.	715.	770.	47.7	280.	440.	400.	373.	83.3
81969	3	945.	830.	750.	842.	98.0	550.	425.	455.	477.	65.3
81973	3	905.	895.	925.	908.	15.3	470.	385.	430.	428.	42.5
81980	3	585.	520.	300.	468.	149.4	175.	200.	215.	197.	20.2
MEAN					729.8					387.3	
S.D.					196.24					91.97	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81918	120.0	87.	93.	90.	4.2
81919	120.0	40.	38.	39.	1.4
81927	45.0	74.	84.	79.	7.1
81936	120.0	67.	50.	59.	12.0
81937	6.0	30.	46.	38.	11.3
81951	10.0	68.	79.	74.	7.8
81955	18.0	78.	84.	81.	4.2
81964	20.0	16.	32.	24.	11.3
81968	120.0	73.	87.	80.	9.9
81969	22.0	68.	75.	72.	4.9
81973	34.0	54.	66.	60.	8.5
81980	120.0	52.	57.	55.	3.5
MEAN	62.9			62.6	
S.D.	51.37			20.47	
N	12			12	

TABLE A54 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81920	3	660.	990.	815.	822.	165.1	495.	540.	555.	530.	31.2
81938	3	1135.	1005.	660.	933.	245.5	635.	755.	560.	650.	98.4
81939	3	1600.	1515.	1225.	1447.	196.6	445.	345.	485.	425.	72.1
81942	3	615.	1275.	800.	897.	340.5	325.	250.	400.	325.	75.0
81950	3	1130.	1025.	1365.	1173.	174.1	405.	555.	525.	495.	79.4
81958	3	1085.	685.	1200.	990.	270.3	475.	305.	505.	428.	107.9
81967	3	1050.	535.	450.	678.	324.7	520.	405.	540.	488.	72.9
81975	3	790.	640.	715.	715.	75.0	190.	120.	245.	185.	62.6
81979	3	535.	195.	190.	307.	197.8	270.	290.	340.	300.	36.1
MEAN					884.7					425.1	
S.D.					320.56					138.63	
N					9					9	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm)			
		1	2	MEAN	S.D.
81920	120.0	37.	29.	33.	5.7
81938	9.0	26.	24.	25.	1.4
81939	44.0	63.	62.	63.	0.7
81942	28.0	62.	70.	66.	5.7
81950	120.0	58.	58.	58.	0.0
81958	26.0	36.	31.	34.	3.5
81967	6.0	73.	71.	72.	1.4
81975	70.0	39.	41.	40.	1.4
81979	26.0	18.	17.	18.	0.7
MEAN	49.9			45.4	
S.D.	44.00			19.62	
N	9			9	

TABLE A54 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 3

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3

DOSE LEVEL: 100 MG/KG — SEX: FEMALES

TEST PERIOD: DAY 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81915	3	965.	1635.	1775.	1458.	432.9	280.	455.	530.	422.	128.3
81916	3	720.	825.	505.	683.	163.1	250.	350.	270.	290.	52.9
81917	3	955.	535.	720.	737.	210.5	320.	475.	600.	465.	140.3
81921	3	1395.	1000.	1250.	1215.	199.8	215.	270.	310.	265.	47.7
81926	3	945.	745.	900.	863.	104.9	355.	380.	440.	392.	43.7
81930	3	300.	645.	230.	392.	222.2	510.	320.	410.	413.	95.0
81941	3	905.	505.	425.	612.	257.2	270.	325.	265.	287.	33.3
81960	3	850.	1425.	1065.	1113.	290.5	435.	220.	360.	338.	109.1
81961	3	1260.	800.	1125.	1062.	236.4	425.	420.	570.	472.	85.2
81962	3	1150.	960.	730.	947.	210.3	480.	520.	355.	452.	86.1
81972	3	1325.	995.	1080.	1133.	171.3	505.	390.	730.	542.	172.9
81978	3	455.	205.	335.	332.	125.0	365.	160.	370.	298.	119.8
MEAN					878.9					386.3	
S.D.					340.06					89.49	
N					12					12	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A54 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG — SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81915	120.0	75.	77.	76.	1.4
81916	23.0	12.	13.	13.	0.7
81917	28.0	48.	42.	45.	4.2
81921	120.0	45.	51.	48.	4.2
81926	24.0	28.	30.	29.	1.4
81930	35.0	39.	30.	35.	6.4
81941	34.0	25.	25.	25.	0.0
81960	120.0	52.	41.	47.	7.8
81961	120.0	74.	84.	79.	7.1
81962	58.0	44.	54.	49.	7.1
81972	120.0	67.	81.	74.	9.9
81978	120.0	64.	65.	65.	0.7
MEAN	76.8			48.8	
S.D.	45.92			21.32	
N	12			12	

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81914	3	1270.	1340.	1145.	1252.	98.8	390.	710.	375.	492.	189.2
81931	3	980.	500.	575.	685.	258.2	640.	510.	455.	535.	95.0
81934	3	535.	895.	1330.	920.	398.1	300.	300.	300.	300.	0.0
81943	3	1445.	845.	960.	1083.	318.4	635.	495.	465.	532.	90.7
81946	3	955.	675.	530.	720.	216.0	215.	195.	355.	255.	87.2
81957	3	1145.	805.	1175.	1042.	205.5	415.	475.	355.	415.	60.0
81959	3	510.	1335.	1285.	1043.	462.6	705.	600.	405.	570.	152.2
81974	3	1060.	790.	800.	883.	153.1	605.	685.	675.	655.	43.6
81976	3	1170.	1030.	1290.	1163.	130.1	395.	465.	430.	430.	35.0
81977	3	200.	1085.	850.	712.	458.4	165.	255.	315.	245.	75.5
MEAN					950.3					442.9	
S.D.					199.03					139.77	
N					10					10	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A54 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - LACTATION DAY 4)

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm)			
		1	2	MEAN	S.D.
81914	32.0	52.	71.	62.	13.4
81931	120.0	41.	33.	37.	5.7
81934	120.0	69.	66.	68.	2.1
81943	120.0	59.	56.	58.	2.1
81946	21.0	23.	25.	24.	1.4
81957	120.0	74.	94.	84.	14.1
81959	49.0	27.	28.	28.	0.7
81974	120.0	91.	59.	75.	22.6
81976	34.0	51.	61.	56.	7.1
81977	21.0	16.	16.	16.	0.0
MEAN	75.7			50.8	
S.D.	47.33			23.16	
N	10			10	

TABLE A54 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 7

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG — SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81918	3	1495.	1300.	825.	1207.	344.6	520.	535.	550.	535.	15.0
81919	3	1135.	1045.	660.	947.	252.3	255.	435.	530.	407.	139.7
81927	3	140.	550.	350.	347.	205.0	155.	190.	110.	152.	40.1
81936	3	605.	1310.	760.	892.	370.5	275.	470.	415.	387.	100.5
81937	3	600.	230.	210.	347.	219.6	90.	105.	110.	102.	10.4
81955	3	1360.	1215.	880.	1152.	246.2	250.	305.	340.	298.	45.4
81968	3	935.	830.	570.	778.	187.9	550.	430.	380.	453.	87.4
81969	3	1080.	1510.	770.	1120.	371.6	480.	915.	430.	608.	266.8
81973	3	1140.	625.	560.	775.	317.8	600.	960.	415.	658.	277.1
81980	3	870.	1075.	1250.	1065.	190.2	755.	295.	405.	485.	240.2
MEAN					863.0					408.5	
S.D.					309.85					182.05	
N					10					10	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81918	1.0	62.	69.	66.	4.9
81919	34.0	56.	36.	46.	14.1
81927	1.0	87.	95.	91.	5.7
81936	84.0	62.	54.	58.	5.7
81937	12.0	18.	20.	19.	1.4
81955	89.0	48.	45.	47.	2.1
81968	120.0	74.	70.	72.	2.8
81969	120.0	75.	64.	70.	7.8
81973	120.0	52.	48.	50.	2.8
81980	120.0	68.	66.	67.	1.4
MEAN	70.1			58.6	
S.D.	52.43			19.49	
N	10			10	

TABLE A55 (F0 FEMALES - NEUROMUSCULAR OBSERAVATIONS - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81932	3	705.	705.	1050.	820.	199.2	330.	455.	445.	410.	69.5
81966	3	375.	605.	655.	545.	149.3	400.	330.	420.	383.	47.3
81971	3	895.	1325.	510.	910.	407.7	420.	370.	580.	457.	109.7
MEAN					758.3					416.7	
S.D.					190.15					37.45	
N					3					3	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A55 (F0 FEMALES - NEUROMUSCULAR OBSERAVATIONS - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm)			
		1	2	MEAN	S.D.
81932	81.0	38.	32.	35.	4.2
81966	120.0	28.	24.	26.	2.8
81971	53.0	48.	36.	42.	8.5
MEAN	84.7			34.3	
S.D.	33.65			8.02	
N	3			3	

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A56 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81945	3	935.	1125.	630.	897.	249.7	325.	410.	360.	365.	42.7
81947	3	740.	795.	970.	835.	120.1	205.	225.	450.	293.	136.0
MEAN					866.0					329.0	
S.D.					43.84					50.91	
N					2					2	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE A56 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - POST-COHABITATION DAY 25)

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm)			
		1	2	MEAN	S.D.
81945	52.0	29.	23.	26.	4.2
81947	120.0	43.	41.	42.	1.4
MEAN	86.0			34.0	
S.D.	48.08			11.31	
N	2			2	

PFOBv3.26
12/16/2010
R:01/10/2011

TABLE A57 (F0 FEMALES - NEUROMUSCULAR OBSERVATIONS - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG — SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	HINDLIMB EXTENSOR STRENGTH	FORELIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.	HINDLIMB GRIP STRENGTH (grams) 1	2	3	MEAN	S.D.
81951	3	720.	1510.	910.	1047.	412.4	370.	345.	485.	400.	74.7
MEAN					1047.0					400.0	
S.D.					0.00					0.00	
N					1					1	

OBSERVATION SCORE, UNLESS STATED OTHERWISE

NEUROMUSCULAR OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	ROTAROD PERFORMANCE (seconds)	HINDLIMB FOOTSPLAY (mm) 1	2	MEAN	S.D.
81951	20.0	61.	61.	61.	0.0
MEAN	20.0			61.0	
S.D.	0.00			0.00	
N	1			1	

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A58 (F0 MALES - PHYSIOLOGICAL OBSERVATIONS - PRETEST)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81988	0.8	38.5	354.6
81989	0.6	38.2	336.8
81991	0.3	38.5	385.4
81996	0.8	37.1	321.2
81997	0.5	36.5	365.3
81998	0.6	36.5	369.7
82014	0.6	37.9	395.6
82020	0.5	36.0	350.5
82021	0.5	37.0	359.8
82025	0.5	36.2	369.2
82038	0.4	36.4	356.5
82041	0.5	38.4	369.7
MEAN	0.6	37.3	361.2
S.D.	0.14	0.97	19.94
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81982	0.4	37.8	394.2
81987	0.4	38.0	336.8
81994	0.4	36.3	351.1
82001	0.6	36.5	373.2
82003	0.4	35.9	369.6
82007	0.4	38.0	380.3
82011	0.6	36.0	363.5
82016	0.5	37.5	390.3
82022	0.4	36.7	356.2
82024	0.5	38.3	340.7
82034	0.2	37.1	340.3
82046	0.4	36.2	366.0
MEAN	0.4	37.0	363.5
S.D.	0.11	0.87	19.21
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81993	0.5	36.3	327.8
81995	0.4	36.2	328.6
82000	0.4	37.2	349.9
82002	0.3	38.2	379.8
82005	0.6	37.6	370.4
82013	0.4	35.8	355.1
82015	0.3	37.2	350.8
82023	0.6	36.1	362.6
82031	0.4	36.2	367.6
82036	0.4	38.0	382.2
82039	0.3	38.3	361.8
82044	0.5	37.2	372.0
MEAN	0.4	37.0	359.0
S.D.	0.11	0.89	17.65
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
82006	0.3	35.4	373.7
82009	0.4	38.2	388.6
82010	0.8	36.1	360.8
82018	0.4	35.6	363.3
82028	0.6	38.2	366.7
82029	0.3	36.4	346.3
82030	0.7	35.9	348.2
82035	0.6	36.4	363.1
82037	0.5	37.6	348.3
82040	0.4	37.1	384.7
82042	0.4	37.8	359.5
82043	0.2	37.7	324.6
MEAN	0.5	36.9	360.7
S.D.	0.18	1.02	17.57
N	12	12	12

TABLE A59 (F0 MALES - PHYSIOLOGICAL OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81988	1.0	38.1	443.0
81989	0.3	37.9	391.4
81991	0.4	37.7	491.6
81996	0.4	38.6	392.2
81997	0.7	38.7	461.2
81998	0.3	38.4	486.8
82014	0.7	36.0	562.7
82020	0.7	37.3	456.0
82021	0.3	38.6	448.9
82025	0.6	38.3	465.2
82038	0.7	37.1	488.5
82041	0.4	37.7	449.9
MEAN	0.5	37.9	461.5
S.D.	0.22	0.78	45.64
N	12	12	12

TABLE A59 (F0 MALES - PHYSIOLOGICAL OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81982	0.3	38.4	461.7
81987	0.3	37.6	382.0
81994	15.4	38.5	448.9
82001	0.2	38.3	478.2
82003	0.6	37.9	519.3
82007	0.6	37.6	490.2
82011	0.4	37.6	437.4
82016	0.4	38.6	512.6
82022	0.3	38.2	428.6
82024	0.5	37.8	412.5
82034	0.5	36.9	398.8
82046	0.7	37.8	470.3
MEAN	1.7	37.9	453.4
S.D.	4.32	0.49	43.50
N	12	12	12

TABLE A59 (F0 MALES - PHYSIOLOGICAL OBSERVATIONS - WEEK 4)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81993	0.2	38.8	375.9
81995	0.4	38.0	404.0
82000	0.4	36.8	462.7
82002	0.5	37.4	456.0
82005	0.4	37.3	461.6
82013	0.2	37.6	425.5
82015	0.3	37.5	425.5
82023	0.3	37.8	461.8
82031	2.5	38.7	462.3
82036	0.4	38.0	507.3
82039	0.7	37.6	426.7
82044	0.5	37.3	455.5
MEAN	0.6	37.7	443.7
S.D.	0.62	0.58	34.13
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: MALES
TEST PERIOD: WEEK 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
82006	0.8	38.2	473.0
82009	0.5	38.2	451.8
82010	0.3	38.5	420.7
82018	0.3	38.9	420.0
82028	0.3	38.1	422.6
82029	0.8	38.5	409.9
82030	1.1	36.8	392.3
82035	0.5	37.3	426.4
82037	0.4	37.8	403.7
82040	0.3	36.5	429.4
82042	0.9	37.6	374.7
82043	0.9	38.0	378.0
MEAN	0.6	37.9	416.9
S.D.	0.29	0.71	28.27
N	12	12	12

TABLE A60 (F0 FEMALES - PHYSIOLOGICAL OBSERAVATIONS - PRETEST)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81920	0.7	38.5	239.5
81932	0.5	37.6	218.3
81938	0.6	39.3	226.6
81939	0.8	39.0	223.7
81942	0.4	37.8	236.8
81950	0.4	39.0	219.6
81958	0.8	38.2	233.9
81966	1.3	38.5	241.9
81967	0.8	39.1	256.4
81971	0.6	39.1	226.0
81975	0.7	38.5	241.4
81979	0.4	39.1	248.3
MEAN	0.7	38.6	234.4
S.D.	0.25	0.55	11.83
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81915	0.5	38.5	269.3
81916	0.3	39.0	216.1
81917	0.8	39.0	239.6
81921	0.7	38.0	228.0
81926	0.5	38.3	215.4
81930	0.7	38.4	222.0
81941	0.5	39.2	227.5
81960	0.6	38.6	234.2
81961	0.7	38.6	257.3
81962	0.4	38.5	241.9
81972	0.5	38.0	227.5
81978	0.8	38.9	251.4
MEAN	0.6	38.6	235.8
S.D.	0.16	0.39	16.72
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81914	0.6	39.3	251.1
81931	0.8	39.1	214.6
81934	0.6	38.1	252.6
81943	0.4	38.2	243.1
81945	0.5	39.5	215.2
81946	0.4	38.3	234.6
81947	0.9	38.3	248.6
81957	0.5	38.9	224.4
81959	0.5	39.0	254.0
81974	0.5	38.7	229.5
81976	0.4	38.5	238.1
81977	0.6	39.0	243.7
MEAN	0.6	38.7	237.5
S.D.	0.16	0.46	13.96
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81918	1.3	38.6	267.3
81919	0.6	38.2	232.5
81927	0.4	38.4	228.8
81936	0.3	37.9	214.6
81937	0.6	38.3	239.8
81951	0.9	38.4	231.9
81955	0.7	38.9	243.5
81964	0.4	37.9	225.5
81968	0.6	38.8	246.6
81969	0.6	38.4	235.3
81973	0.5	38.1	209.3
81980	0.6	39.1	245.5
MEAN	0.6	38.4	235.1
S.D.	0.26	0.38	15.39
N	12	12	12

TABLE A61 (F0 FEMALES - PHYSIOLOGICAL OBSERVATIONS - LACTATION DAY 4)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81920	1.0	38.8	304.3
81938	1.1	38.9	323.2
81939	0.5	38.3	315.2
81942	0.5	39.0	306.1
81950	0.6	39.2	259.9
81958	0.6	38.0	332.8
81967	0.9	39.2	334.4
81975	0.5	38.4	313.4
81979	0.4	38.5	296.4
MEAN	0.7	38.7	309.5
S.D.	0.25	0.42	22.55
N	9	9	9

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 100 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81915	0.4	39.1	352.4
81916	0.7	39.0	279.3
81917	0.4	38.4	275.5
81921	0.5	39.1	293.9
81926	0.3	38.7	286.0
81930	0.4	38.9	276.0
81941	0.4	38.7	271.8
81960	0.9	38.0	273.6
81961	0.9	39.0	344.5
81962	0.6	38.9	291.5
81972	0.7	38.7	290.0
81978	0.5	39.0	326.8
MEAN	0.6	38.8	296.8
S.D.	0.20	0.32	28.32
N	12	12	12

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81914	0.5	39.8	296.5
81931	0.4	39.3	257.0
81934	0.6	39.2	315.8
81943	0.6	38.1	296.0
81946	0.4	39.3	264.2
81957	0.4	39.1	263.5
81959	0.7	39.3	303.0
81974	1.8	39.6	270.2
81976	0.2	38.9	290.3
81977	0.6	39.0	326.8
MEAN	0.6	39.2	288.3
S.D.	0.44	0.46	23.78
N	10	10	10

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG SEX: FEMALES
TEST PERIOD: DAY 4

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81918	0.4	38.8	337.4
81919	0.5	38.8	265.9
81927	0.5	38.9	263.8
81936	0.5	38.7	260.8
81937	0.4	38.7	317.6
81955	0.4	39.1	266.8
81968	0.3	38.9	285.5
81969	1.0	39.5	293.3
81973	0.7	39.5	260.4
81980	0.3	38.8	309.0
MEAN	0.5	39.0	286.0
S.D.	0.21	0.30	27.44
N	10	10	10

TABLE A62 (F0 FEMALES - PHYSIOLOGICAL OBSERVATIONS - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0 MG/KG — SEX: FEMALES
TEST PERIOD: PMD 25

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81932	0.5	38.4	274.4
81966	0.6	38.5	315.0
81971	0.3	39.0	288.7
MEAN	0.5	38.6	292.7
S.D.	0.15	0.32	20.59
N	3	3	3

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A63 (F0 FEMALES - PHYSIOLOGICAL OBSERVATIONS - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 300 MG/KG SEX: FEMALES
TEST PERIOD: PCD 25

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81945	0.4	38.6	262.0
81947	1.8	39.0	305.7
MEAN	1.1	38.8	283.9
S.D.	0.99	0.28	30.90
N	2	2	2

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A64 (F0 FEMALES - PHYSIOLOGICAL OBSERVATIONS - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PHYSIOLOGICAL OBSERVATIONS

DOSE GROUP: 5
DOSE LEVEL: 900 MG/KG — SEX: FEMALES
TEST PERIOD: TLL

ANIMAL NUMBER	CATALEPSY (seconds)	BODY TEMPERATURE (degrees C)	BODY WEIGHT (grams)
81951	0.6	38.3	291.9
MEAN	0.6	38.3	291.9
S.D.	0.00	0.00	0.00
N	1	1	1

PFOBv3.26
12/10/2010
R:01/10/2011

TABLE A65 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

MALE GROUP: 0 MG/KG

TEST PERIOD: PRETEST

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81988	1289	328	944	189	799	156	785	207	13	0	16	1	3846	881
81989	1055	221	453	41	80	0	16	0	22	1	4	0	1630	263
81991	824	162	489	12	162	4	32	1	0	0	127	0	1634	179
81996	1535	362	996	194	132	0	33	0	10	0	38	0	2744	556
81997	1495	301	733	105	182	17	63	0	118	0	82	2	2673	425
81998	1504	357	760	135	625	149	809	257	120	1	24	0	3842	899
82014	978	183	713	141	244	3	188	4	555	76	7	0	2685	407
82020	1289	364	705	82	292	8	14	0	25	0	22	0	2347	454
82021	1191	277	532	59	518	45	202	57	13	0	23	0	2479	438
82025	1764	440	998	193	377	1	53	0	33	3	21	0	3246	637
82038	1451	366	634	82	560	92	50	1	17	0	4	0	2716	541
82041	1879	350	1005	156	172	1	845	81	760	120	31	0	4692	708
MEAN	1355.	309.	747.	116.	345.	40.	258.	51.	141.	17.	33.	0.	2878.	532.
S.D.	312.6	83.6	201.3	61.8	229.7	59.2	340.7	89.4	248.6	39.1	36.1	0.6	902.6	221.2
S.E.	90.2	24.1	58.1	17.8	66.3	17.1	98.4	25.8	71.8	11.3	10.4	0.2	260.6	63.8
N	12													

TABLE A65 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

MALE GROUP: 100 MG/KG

TEST PERIOD: PRETEST

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81982	1256	356	900	195	729	148	171	55	304	37	635	106	3995	897
81987	1209	353	503	83	252	4	4	0	36	0	3	0	2007	440
81994	1238	373	839	153	371	55	197	17	488	70	19	0	3152	668
82001	1295	256	850	103	385	7	13	0	2	0	10	0	2555	366
82003	1535	354	769	151	421	66	398	37	114	0	14	0	3251	608
82007	949	215	374	64	1	0	636	196	344	72	4	0	2308	547
82011	1181	248	837	176	780	119	185	29	130	1	169	0	3282	573
82016	1381	325	814	103	630	55	836	98	699	87	393	54	4753	722
82022	1695	530	1006	190	567	113	38	0	24	0	174	24	3504	857
82024	1282	357	1067	209	708	96	301	7	91	0	4	0	3453	669
82034	1499	401	955	177	494	75	223	34	13	3	22	6	3206	696
82046	1295	300	535	58	81	1	4	0	22	0	20	0	1957	359
MEAN	1318.	339.	787.	139.	452.	62.	251.	39.	189.	23.	122.	16.	3119.	617.
S.D.	192.0	82.4	211.6	53.7	250.4	51.0	261.6	57.3	223.6	34.3	199.7	32.7	815.3	172.3
S.E.	55.4	23.8	61.1	15.5	72.3	14.7	75.5	16.5	64.5	9.9	57.7	9.4	235.4	49.7
N	12													

TABLE A65 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

MALE GROUP: 300 MG/KG

TEST PERIOD: PRETEST

	0 TO 10 MINS		11 TO 20 MINS		21 TO 30 MINS		31 TO 40 MINS		41 TO 50 MINS		51 TO 60 MINS		COMBINED	
ANIMAL	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB
81993	1603	459	634	94	288	93	9	0	13	3	66	1	2613	650
81995	971	160	213	0	30	0	8	0	6	0	43	0	1271	160
82000	1255	326	665	175	327	31	1	0	2	0	35	1	2285	533
82002	1473	281	956	145	451	69	31	1	40	0	29	0	2980	496
82005	1563	366	974	185	837	182	148	3	1	0	102	26	3625	762
82013	1361	274	645	90	144	21	1	0	8	0	25	0	2184	385
82015	1243	315	714	112	851	162	749	161	138	5	7	0	3702	755
82023	1700	490	941	181	668	89	462	41	44	0	45	0	3860	801
82031	1209	313	116	31	1	0	0	0	68	10	417	90	1811	444
82036	1438	448	1011	259	152	5	17	0	3	0	7	0	2628	712
82039	1322	330	764	74	253	9	40	0	88	1	24	0	2491	414
82044	1266	333	479	101	229	23	2	0	27	0	56	9	2059	466
MEAN	1367.	341.	676.	121.	353.	57.	122.	17.	37.	2.	71.	11.	2626.	548.
S.D.	200.7	90.9	290.5	72.2	291.3	63.1	237.4	46.8	42.6	3.1	112.0	26.1	795.2	192.0
S.E.	57.9	26.2	83.9	20.8	84.1	18.2	68.5	13.5	12.3	0.9	32.3	7.5	229.6	55.4
N	12													

TABLE A65 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

MALE GROUP: 900 MG/KG

TEST PERIOD: PRETEST

	0 TO 10 MINS		11 TO 20 MINS		21 TO 30 MINS		31 TO 40 MINS		41 TO 50 MINS		51 TO 60 MINS		COMBINED	
ANIMAL	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB
82006	1786	455	1250	249	434	37	204	5	0	0	0	0	3674	746
82009	1445	330	853	156	484	123	249	27	109	0	142	0	3282	636
82010	1627	354	671	127	249	1	16	0	188	0	37	0	2788	482
82018	1518	431	583	75	109	2	15	1	57	2	2	0	2284	511
82028	1513	372	458	23	613	125	111	0	21	0	52	3	2768	523
82029	994	186	651	70	156	0	89	1	72	0	7	0	1969	257
82030	1332	306	906	144	671	115	298	5	22	0	9	0	3238	570
82035	1140	233	677	46	6	1	11	0	5	0	22	0	1861	280
82037	1110	275	579	104	508	61	4	0	1	0	37	5	2239	445
82040	1624	288	1015	225	827	188	160	21	2	0	317	88	3945	810
82042	1069	315	522	37	460	76	423	103	164	29	13	0	2651	560
82043	1278	273	852	104	864	161	1122	219	610	63	188	29	4914	849
MEAN	1370.	318.	751.	113.	448.	74.	225.	32.	104.	8.	69.	10.	2968.	556.
S.D.	254.8	77.1	229.9	71.3	275.4	67.5	311.6	65.8	171.9	19.3	97.9	25.8	894.8	185.8
S.E.	73.5	22.3	66.4	20.6	79.5	19.5	90.0	19.0	49.6	5.6	28.3	7.4	258.3	53.6
N	12													

TABLE A65 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

MALE GROUP: 0 MG/KG

TEST PERIOD: WEEK 4

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81988	1147	198	872	151	898	131	732	143	291	63	165	35	4105	721
81989	1246	325	702	165	501	92	426	90	5	0	17	0	2897	672
81991	1195	228	449	68	85	0	56	0	215	22	40	0	2040	318
81996	959	110	668	89	173	3	263	23	21	1	19	0	2103	226
81997	1199	183	511	55	270	25	14	0	0	0	15	0	2009	263
81998	1184	248	811	217	859	249	589	210	849	291	537	145	4829	1360
82014	1256	240	400	42	42	0	46	0	43	0	440	53	2227	335
82020	1570	363	1038	219	438	64	473	53	67	3	584	49	4170	751
82021	1052	183	316	41	41	4	676	105	564	69	210	27	2859	429
82025	1491	266	756	87	764	131	155	6	6	0	134	29	3306	519
82038	1690	368	1054	234	749	98	498	117	137	11	66	0	4194	828
82041	1534	296	543	70	917	193	879	206	66	1	131	11	4070	777
MEAN	1294.	251.	677.	120.	478.	83.	401.	79.	189.	38.	197.	29.	3234.	600.
S.D.	224.9	77.8	241.2	73.2	349.5	82.4	292.1	78.3	265.0	83.3	207.4	41.6	1012.6	322.3
S.E.	64.9	22.5	69.6	21.1	100.9	23.8	84.3	22.6	76.5	24.0	59.9	12.0	292.3	93.0
N	12													

TABLE A65 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

MALE GROUP: 100 MG/KG

TEST PERIOD: WEEK 4

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81982	1351	356	717	118	547	77	412	40	576	69	192	41	3795	701
81987	1181	265	509	96	51	0	26	0	231	55	394	82	2392	498
81994	955	178	396	58	126	5	6	0	320	37	13	0	1816	278
82001	983	130	595	45	509	56	74	0	103	0	231	12	2495	243
82003	1164	187	545	71	414	25	138	0	100	0	85	0	2446	283
82007	775	147	438	18	59	0	60	5	17	0	6	0	1355	170
82011	1243	270	585	60	180	28	170	0	69	0	293	28	2540	386
82016	1204	237	707	131	733	134	300	55	318	57	38	1	3300	615
82022	1325	316	805	181	520	132	655	142	451	113	578	86	4334	970
82024	1557	330	849	122	415	26	100	1	76	0	733	172	3730	651
82034	1151	306	905	194	448	92	190	27	49	1	9	0	2752	620
82046	1318	277	595	97	163	4	584	95	243	29	211	6	3114	508
MEAN	1184.	250.	637.	99.	347.	48.	226.	30.	213.	30.	232.	36.	2839.	494.
S.D.	206.8	74.4	161.0	53.2	222.7	49.6	217.3	46.2	176.3	37.1	235.6	53.2	855.4	232.7
S.E.	59.7	21.5	46.5	15.4	64.3	14.3	62.7	13.3	50.9	10.7	68.0	15.3	246.9	67.2
N	12													

TABLE A65 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

MALE GROUP: 300 MG/KG

TEST PERIOD: WEEK 4

	0 TO 10 MINS		11 TO 20 MINS		21 TO 30 MINS		31 TO 40 MINS		41 TO 50 MINS		51 TO 60 MINS		COMBINED	
ANIMAL	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB
81993	1278	315	555	127	380	100	127	43	1	0	6	0	2347	585
81995	642	89	148	3	18	0	8	0	280	1	221	0	1317	93
82000	1243	302	560	65	405	76	23	0	302	43	318	54	2851	540
82002	1357	251	392	9	12	0	526	80	209	41	2	0	2498	381
82005	1207	250	495	114	362	58	139	26	62	5	159	39	2424	492
82013	1150	201	646	99	194	13	18	0	13	0	4	0	2025	313
82015	1199	226	330	36	399	60	428	37	533	77	40	0	2929	436
82023	1381	312	804	108	596	87	274	59	33	0	73	1	3161	567
82031	1092	216	509	74	828	189	181	31	231	49	0	0	2841	559
82036	1121	237	567	72	397	91	32	0	171	27	426	0	2714	427
82039	1004	185	561	25	385	35	100	1	626	73	0	0	2676	319
82044	1271	297	340	39	30	0	43	0	25	0	0	0	1709	336
MEAN	1162.	240.	492.	64.	334.	59.	158.	23.	207.	26.	104.	8.	2458.	421.
S.D.	196.2	64.8	170.0	42.1	242.5	55.4	169.6	27.5	205.1	29.6	145.8	18.3	539.0	143.1
S.E.	56.6	18.7	49.1	12.1	70.0	16.0	49.0	8.0	59.2	8.5	42.1	5.3	155.6	41.3
N	12													

MALE GROUP: 900 MG/KG
TEST PERIOD: WEEK 4

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
82006	1262	296	849	133	658	83	1057	233	741	83	996	140	5563	968
82009	1201	196	618	135	300	61	50	0	108	23	79	5	2356	420
82010	1344	274	878	92	559	86	131	16	196	19	416	70	3524	557
82018	1279	351	466	105	52	0	333	74	14	0	31	2	2175	532
82028	1243	230	572	50	33	0	304	55	80	0	18	0	2250	335
82029	1180	195	525	60	581	78	218	30	341	49	312	13	3157	425
82030	1186	254	833	143	741	157	534	117	481	89	1	0	3776	760
82035	1443	332	646	97	460	110	4	0	41	0	2	0	2596	539
82037	1022	229	678	107	81	1	8	0	35	0	319	49	2143	386
82040	1352	218	688	102	465	94	570	63	66	16	19	0	3160	493
82042	1053	273	534	83	248	25	401	90	478	46	395	110	3109	627
82043	1146	226	829	110	837	174	503	85	231	27	245	48	3791	670
MEAN	1226.	256.	676.	101.	418.	72.	343.	64.	234.	29.	236.	36.	3133.	559.
S.D.	121.9	50.5	141.8	28.3	274.1	58.5	301.8	66.3	230.3	31.4	289.1	48.2	975.9	177.7
S.E.	35.2	14.6	40.9	8.2	79.1	16.9	87.1	19.2	66.5	9.1	83.5	13.9	281.7	51.3
N	12													

PKMASUv1.09
12/10/2010
R:01/10/2011

TABLE A66 (F0 FEMALES - PRETEST)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

FEMALE GROUP: 0 MG/KG
TEST PERIOD: PRETEST

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81920	1492	380	206	24	44	0	791	196	118	10	0	0	2651	610
81932	1206	270	525	47	334	74	5	1	109	0	21	0	2200	392
81938	1706	684	550	154	73	0	27	0	19	0	73	8	2448	846
81939	1517	496	670	183	212	4	369	21	34	0	48	0	2850	704
81942	1324	336	588	102	282	49	748	152	148	1	13	0	3103	640
81950	1570	444	1213	218	646	133	220	37	638	205	1	0	4288	1037
81958	1098	283	340	34	73	0	94	0	18	0	36	0	1659	317
81966	1457	466	767	148	798	111	208	41	5	0	0	0	3235	766
81967	1375	408	687	72	250	24	369	95	23	0	55	10	2759	609
81971	2234	850	1411	432	1279	397	913	201	812	238	1103	415	7752	2533
81975	1136	310	204	1	39	0	84	0	837	286	354	7	2654	604
81979	1392	367	787	128	286	59	566	141	397	89	239	24	3667	808
MEAN	1459.	441.	662.	129.	360.	71.	366.	74.	263.	69.	162.	39.	3272.	822.
S.D.	302.5	171.3	363.1	117.1	373.2	112.5	317.8	79.2	322.4	109.2	315.8	118.7	1564.6	572.3
S.E.	87.3	49.4	104.8	33.8	107.7	32.5	91.7	22.9	93.1	31.5	91.2	34.3	451.7	165.2
N	12													

TABLE A66 (F0 FEMALES - PRETEST)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

FEMALE GROUP: 100 MG/KG
TEST PERIOD: PRETEST

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81915	1600	500	1035	248	408	93	138	37	100	0	461	107	3742	985
81916	1116	241	514	53	167	20	187	0	57	0	23	0	2064	314
81917	1348	386	722	114	637	89	236	4	5	0	7	0	2955	593
81921	1617	430	903	203	77	0	1	0	51	0	681	163	3330	796
81926	1366	305	696	94	414	8	130	0	57	0	11	0	2674	407
81930	1783	502	756	135	359	58	524	104	204	34	8	0	3634	833
81941	1313	374	919	182	818	149	983	361	10	0	30	0	4073	1066
81960	1311	384	234	85	187	51	540	146	22	1	41	0	2335	667
81961	1663	535	1201	337	768	179	281	80	13	0	5	0	3931	1131
81962	1275	399	538	124	89	2	7	0	16	0	10	0	1935	525
81972	1445	351	673	100	114	4	78	5	80	0	55	1	2445	461
81978	1865	517	1025	286	925	317	270	78	738	206	410	88	5233	1492
MEAN	1475.	410.	768.	163.	414.	81.	281.	68.	113.	20.	145.	30.	3196.	773.
S.D.	227.4	90.3	267.1	88.5	305.1	95.0	280.9	104.9	204.5	59.4	233.2	56.4	975.8	347.3
S.E.	65.7	26.1	77.1	25.6	88.1	27.4	81.1	30.3	59.0	17.1	67.3	16.3	281.7	100.3
N	12													

FEMALE GROUP: 300 MG/KG
TEST PERIOD: PRETEST

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81914	1338	430	572	126	145	0	494	48	0	0	46	0	2595	604
81931	1502	508	825	169	862	207	924	281	422	84	10	0	4545	1249
81934	1349	348	796	155	616	132	895	180	79	0	93	1	3828	816
81943	1307	327	341	40	44	1	18	0	16	0	614	127	2340	495
81945	1279	401	620	159	381	102	509	151	252	54	160	37	3201	904
81946	1300	361	932	159	333	38	259	36	701	172	25	0	3550	766
81947	1612	610	282	41	315	47	551	172	497	128	26	0	3283	998
81957	998	253	635	135	301	50	35	0	10	0	11	0	1990	438
81959	1349	413	882	217	542	130	6	2	346	52	58	2	3183	816
81974	1468	396	897	246	426	135	536	197	225	64	33	0	3585	1038
81976	1475	547	1079	298	416	123	220	39	7	0	763	241	3960	1248
81977	1458	320	724	113	594	145	364	70	477	59	262	46	3879	753
MEAN	1370.	410.	715.	155.	415.	93.	401.	98.	253.	51.	175.	38.	3328.	844.
S.D.	154.3	102.2	237.9	75.1	219.5	64.3	311.8	94.1	237.1	56.3	252.7	74.2	731.9	261.5
S.E.	44.5	29.5	68.7	21.7	63.4	18.6	90.0	27.2	68.4	16.3	72.9	21.4	211.3	75.5
N	12													

FEMALE GROUP: 900 MG/KG
TEST PERIOD: PRETEST

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81918	1447	318	877	144	335	18	240	41	219	1	436	125	3554	647
81919	1566	412	861	198	471	102	60	1	1022	200	565	98	4545	1011
81927	1676	369	314	32	98	3	897	171	78	0	38	0	3101	575
81936	1112	280	793	113	248	48	57	0	3	0	36	1	2249	442
81937	1418	367	954	170	829	190	1043	227	934	193	351	46	5529	1193
81951	856	139	1001	201	493	128	14	0	42	0	146	0	2552	468
81955	1813	581	1448	456	215	26	49	0	43	0	36	1	3604	1064
81964	1768	584	967	261	318	99	73	3	422	126	849	195	4397	1268
81968	1026	261	354	10	22	0	786	139	326	20	15	0	2529	430
81969	2113	509	1273	317	1049	257	681	179	79	8	0	0	5195	1270
81973	1389	426	705	104	448	57	357	42	16	0	14	0	2929	629
81980	1758	608	506	131	4	0	35	0	895	291	63	0	3261	1030
MEAN	1495.	405.	838.	178.	378.	77.	358.	67.	340.	70.	212.	39.	3620.	836.
S.D.	364.2	145.5	338.3	123.2	312.5	81.8	386.1	86.3	390.8	104.3	276.6	65.6	1073.4	333.7
S.E.	105.1	42.0	97.7	35.6	90.2	23.6	111.5	24.9	112.8	30.1	79.8	18.9	309.9	96.3
N	12													

PKMASUv1.09
12/10/2010

TABLE A67 (F0 FEMALES - LACTATION DAY 4)

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

FEMALE GROUP: 0 MG/KG
TEST PERIOD: DAY 4

	0 TO 10 MINS		11 TO 20 MINS		21 TO 30 MINS		31 TO 40 MINS		41 TO 50 MINS		51 TO 60 MINS		COMBINED	
ANIMAL	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB	TOTAL	AMB
81920	1337	263	1134	201	1080	194	900	168	62	0	6	0	4519	826
81938	1363	322	817	183	438	27	91	0	44	0	661	111	3414	643
81939	1216	246	201	57	0	0	16	0	66	1	231	60	1730	364
81942	830	160	22	1	31	0	10	0	99	0	10	0	1002	161
81950	904	359	43	7	528	155	6	0	25	1	620	29	2126	551
81958	1225	265	635	77	282	59	586	123	348	19	83	15	3159	558
81967	1032	262	354	101	23	0	100	0	252	52	822	44	2583	459
81975	1184	301	502	116	21	1	4	0	290	77	777	105	2778	600
81979	943	171	665	126	249	20	78	0	282	2	26	4	2243	323
MEAN	1115.	261.	486.	97.	295.	51.	199.	32.	163.	17.	360.	41.	2617.	498.
S.D.	193.7	64.7	369.8	69.6	353.4	73.5	320.5	65.1	127.2	28.4	353.2	43.2	1021.6	196.6
S.E.	64.6	21.6	123.3	23.2	117.8	24.5	106.8	21.7	42.4	9.5	117.7	14.4	340.5	65.5
N	9													

FEMALE GROUP: 100 MG/KG
TEST PERIOD: DAY 4

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81915	1017	191	836	133	731	183	562	90	610	103	734	172	4490	872
81916	1068	240	108	7	92	6	47	0	10	0	406	65	1731	318
81917	1231	214	853	80	177	53	434	101	101	8	32	14	2828	470
81921	1185	287	1041	288	483	72	836	189	67	3	34	0	3646	839
81926	1161	242	103	0	17	0	1	0	26	0	33	0	1341	242
81930	1246	340	38	2	18	0	119	2	76	3	10	0	1507	347
81941	1293	267	625	81	855	187	495	100	87	11	239	80	3594	726
81960	1259	330	558	56	500	20	225	45	687	16	565	84	3794	551
81961	1330	297	54	0	4	0	93	0	542	64	217	3	2240	364
81962	1080	293	187	0	254	0	118	4	50	3	42	0	1731	300
81972	666	148	6	0	26	1	43	0	19	0	3	0	763	149
81978	1634	449	666	164	362	41	68	3	455	51	799	86	3984	794
MEAN	1181.	275.	423.	68.	293.	47.	253.	45.	228.	22.	260.	42.	2637.	498.
S.D.	227.3	78.5	377.9	89.9	294.4	68.9	265.2	62.0	262.1	33.1	295.8	55.3	1236.7	252.1
S.E.	65.6	22.7	109.1	25.9	85.0	19.9	76.6	17.9	75.7	9.6	85.4	16.0	357.0	72.8
N	12													

FEMALE GROUP: 300 MG/KG
TEST PERIOD: DAY 4

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81914	1143	308	595	84	573	12	80	4	164	1	96	3	2651	412
81931	1330	291	756	142	679	76	431	87	699	155	630	157	4525	908
81934	1134	293	223	37	5	0	83	26	9	0	25	0	1479	356
81943	1242	284	557	52	125	1	58	0	49	0	90	0	2121	337
81946	1117	258	751	136	671	134	470	37	869	257	725	173	4603	995
81957	1050	235	567	32	17	0	63	0	79	3	24	1	1800	271
81959	1155	331	556	32	434	97	366	50	83	1	48	5	2642	516
81974	925	206	108	5	67	4	17	0	35	0	4	0	1156	215
81976	1349	351	128	12	112	2	737	101	440	1	111	36	2877	503
81977	1007	222	226	35	41	1	52	0	4	0	15	3	1345	261
MEAN	1145.	278.	447.	57.	272.	33.	236.	31.	243.	42.	177.	38.	2520.	477.
S.D.	134.5	47.2	250.3	48.4	283.0	50.1	247.6	38.0	314.5	89.8	267.4	68.0	1225.7	269.3
S.E.	42.5	14.9	79.2	15.3	89.5	15.9	78.3	12.0	99.5	28.4	84.5	21.5	387.6	85.1
N	10													

TABLE A67 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

FEMALE GROUP: 900 MG/KG
TEST PERIOD: DAY 4

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81918	1258	243	320	18	994	116	1107	217	579	55	107	0	4365	649
81919	1179	293	508	48	0	0	5	0	72	0	510	45	2274	386
81927	1154	186	160	8	18	1	107	0	59	0	82	3	1580	198
81936	1060	197	416	26	26	1	37	0	4	0	0	0	1543	224
81937	1327	301	587	107	147	22	27	1	631	89	401	14	3120	534
81955	1177	236	1144	219	964	200	757	181	897	219	1112	271	6051	1326
81968	1018	276	613	68	160	1	21	0	43	0	10	0	1865	345
81969	1182	234	80	0	521	147	775	139	10	0	20	0	2588	520
81973	1046	237	363	33	13	0	24	0	41	0	29	1	1516	271
81980	936	213	251	62	0	0	1	0	366	66	6	0	1560	341
MEAN	1134.	242.	444.	59.	284.	49.	286.	54.	270.	43.	228.	33.	2646.	479.
S.D.	117.9	38.5	301.2	64.7	398.5	75.8	421.0	88.3	325.6	70.6	358.8	84.7	1503.1	330.6
S.E.	37.3	12.2	95.2	20.5	126.0	24.0	133.1	27.9	103.0	22.3	113.5	26.8	475.3	104.6
N	10													

PKMASUv1.09
12/10/2010
R:01/10/2011

TABLE A68 (F0 FEMALES - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

FEMALE GROUP: 0 MG/KG
TEST PERIOD: PMD 25

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81932	1365	383	700	86	159	56	12	1	41	0	18	0	2295	526
81966	1648	467	653	184	758	262	282	85	6	0	24	0	3371	998
81971	1783	576	1127	186	37	1	345	98	8	0	17	0	3317	861
MEAN	1599.	475.	827.	152.	318.	106.	213.	61.	18.	0.	20.	0.	2994.	795.
S.D.	213.3	96.8	261.2	57.2	385.9	137.6	176.9	52.7	19.7	0.0	3.8	0.0	606.2	242.8
S.E.	123.2	55.9	150.8	33.0	222.8	79.4	102.1	30.4	11.3	0.0	2.2	0.0	350.0	140.2
N	3													

PKMASUv1.09
12/10/2010
R:01/10/2011

TABLE A69 (F0 FEMALES - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

FEMALE GROUP: 300 MG/KG
TEST PERIOD: PCD 25

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81945	1435	310	768	197	59	0	55	0	283	2	603	59	3203	568
81947	1061	343	502	65	193	7	752	225	73	1	61	0	2642	641
MEAN	1248.	327.	635.	131.	126.	4.	404.	113.	178.	2.	332.	30.	2923.	605.
S.D.	264.5	23.3	188.1	93.3	94.8	4.9	492.9	159.1	148.5	0.7	383.3	41.7	396.7	51.6
S.E.	187.0	16.5	133.0	66.0	67.0	3.5	348.5	112.5	105.0	0.5	271.0	29.5	280.5	36.5
N	2													

PKMASUv1.09
12/10/2010
R:01/10/2011

TABLE A70 (F0 FEMALES - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MOTOR ACTIVITY COUNTS

FEMALE GROUP: 900 MG/KG
TEST PERIOD: TLL

ANIMAL	0 TO 10 MINS TOTAL	0 TO 10 MINS AMB	11 TO 20 MINS TOTAL	11 TO 20 MINS AMB	21 TO 30 MINS TOTAL	21 TO 30 MINS AMB	31 TO 40 MINS TOTAL	31 TO 40 MINS AMB	41 TO 50 MINS TOTAL	41 TO 50 MINS AMB	51 TO 60 MINS TOTAL	51 TO 60 MINS AMB	COMBINED TOTAL	COMBINED AMB
81951	1278	273	737	78	328	37	5	1	9	0	57	0	2414	389
MEAN	1278.	273.	737.	78.	328.	37.	5.	1.	9.	0.	57.	0.	2414.	389.
S.D.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S.E.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N	1													

PKMASUv1.09
12/10/2010
R:01/10/2011

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 1
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL
GROUP: 0 MG/KG MALES										
81988	8.91	9.56	16.8	52.6	55.1	17.6	31.9	747.	1.2	112.1
81989	6.45	9.65	15.3	48.7	50.5	15.9	31.5	1087.	1.1	101.6
81991	8.30	9.32	16.0	49.3	53.0	17.2	32.4	1054.	1.2	112.1
81996	11.85	9.61	16.2	49.0	51.1	16.8	33.0	836.	0.8	78.5
81997	9.67	9.80	16.3	49.9	50.9	16.6	32.7	626.	1.2	115.1
81998	11.49	8.95	15.5	47.6	53.2	17.4	32.6	878.	1.4	125.7
82014	6.79	8.76	15.3	47.9	54.6	17.4	32.0	935.	1.2	106.2
82020	7.44	8.65	15.2	44.8	51.7	17.5	33.9	728.	0.9	74.0
82021	10.46	8.11	14.1	43.3	53.4	17.4	32.5	847.	1.3	105.7
82025	8.00	9.96	16.3	49.8	50.0	16.3	32.7	640.	0.7	68.6
82038	18.76	9.02	15.1	46.5	51.5	16.7	32.4	1012.	1.7	153.5
82041	6.65	9.22	15.7	48.2	52.3	17.0	32.6	860.	1.0	94.9
MEAN	9.56	9.22	15.7	48.1	52.3	17.0	32.5	854.	1.1	104.0
S.D.	3.427	0.542	0.72	2.45	1.61	0.53	0.60	151.3	0.27	23.50
S.E.	0.989	0.156	0.21	0.71	0.47	0.15	0.17	43.7	0.08	6.78
N	12	12	12	12	12	12	12	12	12	12

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 0 MG/KG MALES						
81988	14.5	79.5	2.7	2.5	0.4	0.4
81989	11.0	86.9	0.7	0.8	0.2	0.4
81991	23.2	73.7	2.1	0.5	0.2	0.3
81996	20.0	71.0	6.0	3.0	0.0	0.0
81997	11.0	78.0	10.0	1.0	0.0	0.0
81998	13.1	84.3	1.0	1.0	0.3	0.3
82014	15.2	81.7	1.6	0.9	0.3	0.3
82020	13.0	75.0	11.0	1.0	0.0	0.0
82021	8.9	88.8	1.0	0.7	0.4	0.2
82025	13.0	77.0	9.0	1.0	0.0	0.0
82038	19.6	76.5	2.4	0.7	0.5	0.3
82041	20.1	75.9	1.9	1.5	0.3	0.3
MEAN	15.2	79.0	4.1	1.2	0.2	0.2
S.D.	4.47	5.42	3.82	0.76	0.18	0.16
S.E.	1.29	1.56	1.10	0.22	0.05	0.05
N	12	12	12	12	12	12

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 MG/KG MALES								
81988	1.29	7.08	0.24	0.23	0.04	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81989	0.71	5.61	0.05	0.05	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81991	1.92	6.12	0.18	0.04	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81996	2.37	8.41	0.71	0.36	0.00	0.00	ADEQUATE	
81997	1.06	7.54	0.97	0.10	0.00	0.00	ADEQUATE	2-PLT CLUM
81998	1.50	9.69	0.11	0.12	0.04	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82014	1.03	5.55	0.11	0.06	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82020	0.97	5.58	0.82	0.07	0.00	0.00	ADEQUATE	2-PLT CLUM
82021	0.93	9.29	0.10	0.07	0.04	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82025	1.04	6.16	0.72	0.08	0.00	0.00	ADEQUATE	
82038	3.68	14.34	0.45	0.14	0.09	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82041	1.34	5.05	0.13	0.10	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.49	7.54	0.38	0.12	0.02	0.02		
S.D.	0.832	2.638	0.334	0.092	0.026	0.017		
S.E.	0.240	0.761	0.096	0.026	0.008	0.005		
N	12	12	12	12	12	12		

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

2 = MODERATE, PLT CLUM = PLATELET CLUMPS

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	PT	APTT	MPV	RDW	HDW
	seconds	seconds	fL	%	g/dL
GROUP: 0 MG/KG MALES					
81988	18.2	23.9	7.00	11.4	2.40
81989	20.9	25.1	6.00	12.0	2.51
81991	18.3	24.0	7.00	11.6	2.74
81996	16.3	16.9	6.20	12.1	2.63
81997	17.0	20.6	6.80	11.3	2.62
81998	18.2	23.3	6.00	11.6	2.59
82014	16.6	17.2	6.50	11.1	2.65
82020	17.2	19.1	7.20	11.0	2.51
82021	17.9	23.3	7.60	11.0	2.49
82025	17.6	17.2	6.50	10.7	2.52
82038	16.9	18.5	6.00	11.7	2.70
82041	16.2	22.3	6.40	10.9	2.54
MEAN	17.6	21.0	6.60	11.4	2.58
S.D.	1.27	3.05	0.524	0.44	0.097
S.E.	0.37	0.88	0.151	0.13	0.028
N	12	12	12	12	12

fL = FEMTOLITERS, g/dL = GRAMS/DECILITER

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL
GROUP: 100 MG/KG MALES										
81982	9.70	9.57	16.7	52.4	54.8	17.5	31.9	876.	1.5	138.8
81987	8.87	9.41	15.4	48.6	51.7	16.4	31.7	774.	1.1	100.0
81994	14.89	9.24	16.4	48.6	52.6	17.8	33.8	996.	1.1	99.1
82001	11.97	9.19	15.2	46.5	50.6	16.6	32.7	860.	0.9	81.7
82003	13.06	9.34	15.9	47.8	51.2	17.0	33.1	984.	0.8	78.8
82007	10.28	9.34	15.6	48.8	52.3	16.7	32.0	865.	1.6	149.0
82011	14.77	8.51	15.2	46.0	54.0	17.9	33.1	736.	1.4	116.5
82016	7.49	9.16	15.6	48.7	53.2	17.1	32.1	891.	1.4	124.3
82022	14.09	9.35	16.2	48.8	52.2	17.3	33.2	857.	0.9	81.6
82024	5.67	9.28	15.5	47.9	51.6	16.7	32.4	919.	1.2	110.7
82034	8.52	9.63	15.6	49.5	51.4	16.2	31.6	1013.	0.8	79.2
82046	10.15	9.35	16.1	49.0	52.4	17.3	33.0	848.	1.3	123.6
MEAN	10.79	9.28	15.8	48.6	52.3	17.0	32.6	885.	1.2	106.9
S.D.	2.983	0.279	0.48	1.59	1.20	0.54	0.70	83.9	0.28	24.16
S.E.	0.861	0.081	0.14	0.46	0.35	0.16	0.20	24.2	0.08	6.97
N	12	12	12	12	12	12	12	12	12	12

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 100 MG/KG MALES						
81982	37.4	59.1	2.4	0.6	0.3	0.3
81987	21.9	74.6	2.1	0.9	0.3	0.3
81994	31.0	65.1	2.8	0.4	0.5	0.2
82001	15.3	80.9	2.2	0.6	0.5	0.5
82003	14.4	81.7	2.2	0.9	0.5	0.3
82007	25.7	70.6	2.0	1.2	0.4	0.1
82011	19.8	77.4	1.3	0.8	0.3	0.4
82016	22.1	71.7	2.3	3.2	0.4	0.3
82022	11.0	86.0	3.0	0.0	0.0	0.0
82024	22.8	73.1	2.1	1.5	0.4	0.1
82034	19.2	77.1	2.2	0.9	0.3	0.3
82046	13.2	83.5	1.9	0.5	0.4	0.4
MEAN	21.2	75.1	2.2	1.0	0.4	0.3
S.D.	7.61	7.79	0.43	0.80	0.14	0.14
S.E.	2.20	2.25	0.12	0.23	0.04	0.04
N	12	12	12	12	12	12

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 7

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 100 MG/KG MALES								
81982	3.62	5.73	0.24	0.05	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81987	1.94	6.61	0.19	0.08	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81994	4.61	9.70	0.42	0.05	0.08	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82001	1.83	9.68	0.26	0.07	0.07	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82003	1.88	10.67	0.29	0.12	0.06	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82007	2.64	7.26	0.20	0.12	0.04	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82011	2.92	11.43	0.19	0.12	0.05	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82016	1.65	5.37	0.17	0.24	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82022	1.55	12.12	0.42	0.00	0.00	0.00	ADEQUATE 1-PLT CLUM	
82024	1.29	4.14	0.12	0.08	0.02	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82034	1.64	6.57	0.18	0.08	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82046	1.34	8.48	0.20	0.05	0.04	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	2.24	8.15	0.24	0.09	0.04	0.03		
S.D.	1.019	2.577	0.095	0.059	0.023	0.018		
S.E.	0.294	0.744	0.027	0.017	0.007	0.005		
N	12	12	12	12	12	12		

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, PLT CLUM = PLATELET CLUMPS

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 8

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	PT	APTT	MPV	RDW	HDW
	seconds	seconds	fL	%	g/dL
GROUP: 100 MG/KG MALES					
81982	17.7	20.9	7.00	11.7	2.69
81987	17.4	20.7	6.40	11.4	2.58
81994	18.3	24.3	6.20	11.3	2.61
82001	17.4	21.1	5.70	11.2	2.49
82003	17.6	22.4	6.00	10.8	2.68
82007	17.5	20.3	7.30	11.5	2.69
82011	20.5	23.2	5.90	11.5	2.67
82016	17.4	24.8	6.90	11.0	2.89
82022	18.5	21.5	6.60	12.4	2.82
82024	19.0	23.3	6.40	11.4	2.84
82034	24.5	23.1	6.70	12.0	2.53
82046	17.1	17.6	5.90	11.2	2.72
MEAN	18.6	21.9	6.42	11.5	2.68
S.D.	2.09	2.00	0.499	0.43	0.122
S.E.	0.60	0.58	0.144	0.12	0.035
N	12	12	12	12	12

fL = FEMTOLITERS, g/dL = GRAMS/DECILITER

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 9
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL
GROUP: 300 MG/KG MALES										
81993	11.45	8.86	14.9	45.8	51.7	16.8	32.4	800.	1.0	90.5
81995	7.87	8.82	15.5	46.6	52.8	17.6	33.3	733.	0.8	71.2
82000	8.69	9.00	15.4	47.7	52.9	17.1	32.3	920.	1.5	138.7
82002	9.05	9.41	16.3	49.5	52.6	17.4	33.0	891.	1.0	98.6
82005	5.33	9.21	15.1	46.9	50.8	16.4	32.2	844.	0.8	78.0
82013	6.70	8.95	15.3	46.4	51.9	17.1	33.0	898.	0.8	73.4
82015	7.81	8.91	14.7	46.3	52.0	16.5	31.8	603.	1.2	110.1
82023	10.37	9.27	15.9	46.8	50.4	17.1	34.0	863.	0.8	78.2
82031	8.76	8.60	14.8	44.2	51.4	17.2	33.5	1006.	0.7	58.6
82036	9.07	8.16	14.3	43.7	53.6	17.5	32.6	893.	1.3	104.3
82039	9.12	8.58	15.5	47.5	55.4	18.0	32.6	664.	1.3	108.4
82044	10.44	9.13	15.2	46.4	50.8	16.6	32.7	524.	1.2	106.9
MEAN	8.72	8.91	15.2	46.5	52.2	17.1	32.8	803.	1.0	93.1
S.D.	1.669	0.345	0.54	1.52	1.39	0.48	0.61	143.7	0.26	22.29
S.E.	0.482	0.099	0.16	0.44	0.40	0.14	0.18	41.5	0.08	6.43
N	12	12	12	12	12	12	12	12	12	12

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 10

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 300 MG/KG MALES						
81993	20.6	74.9	2.6	1.1	0.3	0.5
81995	15.5	81.2	2.1	0.7	0.2	0.3
82000	15.3	82.0	1.2	0.7	0.5	0.2
82002	25.6	70.4	2.4	1.3	0.3	0.2
82005	23.6	74.4	0.8	0.8	0.2	0.2
82013	15.6	81.5	1.5	0.8	0.3	0.3
82015	19.4	76.0	2.4	1.6	0.3	0.2
82023	18.4	79.4	1.0	0.5	0.5	0.2
82031	23.2	74.1	1.5	0.7	0.2	0.3
82036	22.9	74.0	1.5	0.7	0.4	0.5
82039	17.9	76.8	2.3	2.3	0.5	0.2
82044	23.0	66.0	11.0	0.0	0.0	0.0
MEAN	20.1	75.9	2.5	0.9	0.3	0.3
S.D.	3.58	4.75	2.74	0.59	0.15	0.14
S.E.	1.03	1.37	0.79	0.17	0.04	0.04
N	12	12	12	12	12	12

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 11
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 300 MG/KG MALES								
81993	2.36	8.58	0.30	0.12	0.04	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81995	1.22	6.39	0.17	0.05	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82000	1.33	7.13	0.10	0.06	0.04	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82002	2.31	6.36	0.22	0.11	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82005	1.26	3.97	0.04	0.04	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82013	1.04	5.47	0.10	0.05	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82015	1.52	5.94	0.18	0.13	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82023	1.91	8.24	0.10	0.05	0.05	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82031	2.04	6.49	0.13	0.07	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82036	2.07	6.71	0.14	0.07	0.03	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82039	1.63	7.00	0.21	0.21	0.05	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82044	2.40	6.89	1.15	0.00	0.00	0.00	ADEQUATE 1-PLT CLUM	
MEAN	1.76	6.60	0.24	0.08	0.03	0.02		
S.D.	0.485	1.202	0.296	0.055	0.016	0.016		
S.E.	0.140	0.347	0.085	0.016	0.005	0.005		
N	12	12	12	12	12	12		

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, PLT CLUM = PLATELET CLUMPS

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 12

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	PT	APTT	MPV	RDW	HDW
	seconds	seconds	fL	%	g/dL
GROUP: 300 MG/KG MALES					
81993	17.1	23.6	6.10	11.9	2.80
81995	17.4	19.0	6.10	12.2	2.80
82000	18.4	21.6	6.30	11.9	2.60
82002	21.4	24.2	7.60	11.1	2.68
82005	21.5	26.7	6.50	11.4	2.63
82013	18.8	21.3	6.10	11.3	2.89
82015	17.7	21.1	6.90	11.8	2.76
82023	16.8	15.3	6.90	11.6	2.98
82031	18.0	24.4	5.80	11.8	2.61
82036	17.5	22.5	6.20	11.7	2.88
82039	18.4	21.7	7.70	11.0	2.53
82044	19.3	21.7	7.20	11.8	3.01
MEAN	18.5	21.9	6.62	11.6	2.76
S.D.	1.54	2.88	0.632	0.36	0.157
S.E.	0.44	0.83	0.183	0.10	0.045
N	12	12	12	12	12

fL = FEMTOLITERS, g/dL = GRAMS/DECILITER

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 13
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL
GROUP: 900 MG/KG MALES										
82006	11.32	8.56	14.5	43.7	51.0	17.0	33.2	1019.	1.5	131.3
82009	7.93	8.43	14.3	44.2	52.5	17.0	32.4	1045.	1.8	148.6
82010	15.18	8.77	14.6	44.4	50.6	16.7	33.0	844.	1.0	84.9
82018	12.48	8.68	15.1	44.8	51.6	17.4	33.8	959.	0.9	76.1
82028	10.39	9.10	15.0	46.9	51.5	16.5	32.1	963.	1.1	99.0
82029	15.75	9.12	15.4	46.3	50.8	16.8	33.1	1019.	1.0	87.4
82030	9.92	8.59	14.2	42.3	49.3	16.5	33.5	847.	1.0	82.4
82035	12.09	8.69	14.7	44.1	50.8	16.9	33.2	998.	1.4	118.4
82037	11.95	8.86	15.1	48.1	54.3	17.0	31.3	942.	1.6	142.1
82040	7.68	8.74	14.3	43.6	49.9	16.3	32.7	1114.	0.9	81.0
82042	12.14	8.77	14.1	44.2	50.5	16.1	31.9	1082.	0.9	78.5
82043	6.47	9.03	15.2	47.3	52.3	16.8	32.2	880.	1.4	125.2
MEAN	11.11	8.78	14.7	45.0	51.3	16.8	32.7	976.	1.2	104.6
S.D.	2.830	0.216	0.44	1.75	1.32	0.36	0.73	87.4	0.31	26.85
S.E.	0.817	0.062	0.13	0.50	0.38	0.10	0.21	25.2	0.09	7.75
N	12	12	12	12	12	12	12	12	12	12

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 14

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 900 MG/KG MALES						
82006	13.0	81.0	6.0	0.0	0.0	0.0
82009	21.4	74.3	2.9	0.7	0.3	0.4
82010	11.9	83.7	3.0	0.2	0.5	0.7
82018	11.4	86.7	0.7	0.4	0.5	0.3
82028	30.4	65.0	1.7	2.5	0.2	0.3
82029	20.6	75.5	2.4	0.8	0.5	0.3
82030	21.3	75.5	2.5	0.2	0.3	0.3
82035	21.8	73.5	3.2	0.4	0.5	0.5
82037	13.0	83.3	2.4	0.5	0.5	0.4
82040	16.0	81.0	1.8	0.7	0.2	0.4
82042	15.7	81.4	1.4	0.7	0.4	0.5
82043	24.2	72.7	1.6	1.0	0.2	0.3
MEAN	18.4	77.8	2.5	0.7	0.3	0.4
S.D.	5.83	6.10	1.33	0.64	0.17	0.17
S.E.	1.68	1.76	0.38	0.19	0.05	0.05
N	12	12	12	12	12	12

TABLE A71 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 15
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES WEEK 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 900 MG/KG MALES								
82006	1.47	9.17	0.68	0.00	0.00	0.00	ADEQUATE	1-LARGE PL 2-PLT CLUM
82009	1.70	5.89	0.23	0.05	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82010	1.80	12.70	0.45	0.03	0.08	0.11	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82018	1.42	10.82	0.09	0.05	0.06	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82028	3.15	6.76	0.18	0.26	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82029	3.24	11.88	0.37	0.13	0.08	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82030	2.11	7.49	0.25	0.02	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82035	2.64	8.88	0.39	0.05	0.07	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82037	1.55	9.95	0.28	0.06	0.06	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82040	1.23	6.22	0.14	0.05	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82042	1.90	9.88	0.17	0.08	0.05	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
82043	1.56	4.70	0.10	0.06	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.98	8.70	0.28	0.07	0.04	0.04		
S.D.	0.676	2.506	0.171	0.068	0.027	0.027		
S.E.	0.195	0.723	0.049	0.020	0.008	0.008		
N	12	12	12	12	12	12		

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, 2 = MODERATE, LARGE PL = LARGE PLATELET, PLT CLUM = PLATELET CLUMPS

ANIMAL	PT	APTT	MPV	RDW	HDW
	seconds	seconds	fL	%	g/dL
GROUP: 900 MG/KG MALES					
82006	18.9	25.7	6.70	12.7	2.98
82009	18.8	22.8	6.90	12.9	2.76
82010	16.1	18.8	6.30	12.7	3.01
82018	16.3	21.8	5.60	12.9	2.77
82028	17.5	21.1	6.90	12.7	2.70
82029	17.5	23.5	5.90	12.1	2.76
82030	17.6	16.6	6.00	12.4	2.51
82035	17.3	22.2	6.10	13.1	3.22
82037	16.8	22.8	7.00	13.0	2.62
82040	17.6	23.4	6.20	11.5	3.14
82042	18.3	22.8	5.90	11.3	2.36
82043	19.8	27.2	6.90	12.2	2.46
MEAN	17.7	22.4	6.37	12.5	2.77
S.D.	1.09	2.78	0.489	0.58	0.270
S.E.	0.31	0.80	0.141	0.17	0.078
N	12	12	12	12	12

fL = FEMTOLITERS, g/dL = GRAMS/DECILITER

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE	MPV
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL	fL
GROUP: 0 MG/KG FEMALES											
81920	4.58	7.20	12.6	38.9	54.0	17.5	32.4	1181.	2.3	166.0	5.80
81938	5.41	6.36	11.9	36.7	57.7	18.6	32.3	1249.	4.2	266.7	6.40
81939	6.49	7.18	13.1	41.0	57.1	18.2	31.9	1013.	3.0	214.7	5.80
81942	7.53	6.83	12.2	39.1	57.2	17.8	31.1	1202.	4.7	320.8	5.70
81950	4.59	6.32	12.0	37.7	59.6	19.0	31.9	1284.	5.1	324.7	5.60
81958	5.29	5.55	10.7	33.7	60.8	19.2	31.6	1228.	5.5	307.9	5.90
81967	4.99	6.58	11.9	36.7	55.7	18.1	32.4	1533.	4.1	268.5	5.60
81975	4.56	6.99	12.2	37.3	53.3	17.4	32.7	1284.	2.4	170.4	5.10
81979	2.93	6.18	11.8	37.1	60.0	19.1	31.8	1468.	5.7	351.2	5.80
MEAN	5.15	6.58	12.0	37.6	57.3	18.3	32.0	1271.	4.1	265.7	5.74
S.D.	1.298	0.538	0.65	2.02	2.61	0.69	0.49	153.9	1.29	68.23	0.340
S.E.	0.433	0.179	0.22	0.67	0.87	0.23	0.16	51.3	0.43	22.74	0.113
N	9	9	9	9	9	9	9	9	9	9	9

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP:	0 MG/KG	FEMALES				
81920	29.2	68.8	1.1	0.6	0.2	0.1
81938	39.0	58.0	1.9	0.6	0.3	0.2
81939	38.1	59.1	1.4	1.0	0.2	0.2
81942	41.0	54.5	3.9	0.3	0.1	0.1
81950	27.0	72.0	1.0	0.0	0.0	0.0
81958	26.2	71.5	1.7	0.2	0.2	0.2
81967	26.0	69.0	5.0	0.0	0.0	0.0
81975	28.2	69.8	1.3	0.2	0.2	0.2
81979	32.0	68.0	0.0	0.0	0.0	0.0
MEAN	31.9	65.6	1.9	0.3	0.1	0.1
S.D.	5.96	6.56	1.55	0.35	0.11	0.09
S.E.	1.99	2.19	0.52	0.12	0.04	0.03
N	9	9	9	9	9	9

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES DAY 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 MG/KG FEMALES								
81920	1.34	3.15	0.05	0.03	0.01	0.00	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81938	2.11	3.14	0.10	0.03	0.02	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81939	2.47	3.83	0.09	0.06	0.02	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81942	3.09	4.10	0.29	0.02	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81950	1.24	3.30	0.05	0.00	0.00	0.00	ADEQUATE	1-ANISO 3-POL
81958	1.39	3.78	0.09	0.01	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81967	1.30	3.44	0.25	0.00	0.00	0.00	INCREASE	1-HYPO 1-ANISO 3-POL
81975	1.29	3.18	0.06	0.01	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81979	0.94	1.99	0.00	0.00	0.00	0.00	ADEQUATE	2-HYPO 2-ANISO 3-POL
MEAN	1.69	3.32	0.11	0.02	0.01	0.01		
S.D.	0.710	0.607	0.097	0.020	0.008	0.005		
S.E.	0.237	0.202	0.032	0.007	0.003	0.002		
N	9	9	9	9	9	9		

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, 2 = MODERATE, HYPO = HYPOCHROMIA, ANISO = ANISOCYTOSIS

ANIMAL	PT	APTT	RDW	HDW
	seconds	seconds	%	g/dL
GROUP: 0 MG/KG FEMALES				
81920	17.4	17.0	13.6	2.36
81938	17.3	18.3	15.6	2.38
81939	18.7	13.3	14.6	2.38
81942	17.7	15.8	16.9	2.49
81950	18.8	17.3	17.3	2.33
81958	17.7	17.5	22.1	2.71
81967	17.8	19.4	15.8	2.61
81975	18.8	18.2	13.8	2.53
81979	17.5	14.8	19.5	3.01
MEAN	18.0	16.8	16.6	2.53
S.D.	0.62	1.90	2.78	0.219
S.E.	0.21	0.63	0.93	0.073
N	9	9	9	9

g/dL = GRAMS/DECILITER

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE	MPV
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL	fL
GROUP: 100 MG/KG FEMALES											
81915	6.02	7.46	12.9	40.8	54.7	17.3	31.5	1192.	4.2	310.2	6.80
81916	8.22	7.58	13.2	41.0	54.1	17.4	32.3	1378.	2.3	178.0	5.70
81917	7.60	6.80	11.7	38.5	56.6	17.2	30.3	1102.	7.7	524.4	6.20
81921	5.88	6.20	11.4	36.1	58.1	18.5	31.7	1213.	15.1	936.2	6.10
81926	9.94	5.80	10.3	32.7	56.3	17.7	31.5	1626.	14.0	812.0	5.90
81930	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
81941	5.02	6.93	12.1	38.5	55.5	17.5	31.6	1304.	3.4	232.9	5.80
81960	6.26	6.74	11.5	36.3	53.9	17.1	31.7	1300.	4.7	318.9	6.60
81961	7.05	6.90	12.6	39.7	57.5	18.3	31.9	1073.	5.0	348.1	6.30
81962	7.23	6.39	11.1	34.9	54.7	17.4	31.8	1184.	5.4	342.9	6.30
81972	8.16	6.77	12.4	39.1	57.8	18.3	31.7	1110.	3.1	212.8	5.80
81978	4.43	7.86	13.4	41.2	52.4	17.1	32.5	1088.	1.7	136.4	5.90
MEAN	6.89	6.86	12.1	38.1	55.6	17.6	31.7	1234.	6.1	395.7	6.13
S.D.	1.583	0.608	0.95	2.75	1.82	0.51	0.56	163.8	4.51	259.78	0.352
S.E.	0.477	0.183	0.29	0.83	0.55	0.15	0.17	49.4	1.36	78.33	0.106
N	11	11	11	11	11	11	11	11	11	11	11

LA = LAB ACCIDENT

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 100 MG/KG FEMALES						
81915	31.6	63.8	4.0	0.2	0.3	0.1
81916	26.0	64.0	10.0	0.0	0.0	0.0
81917	28.0	69.4	1.9	0.1	0.3	0.3
81921	28.9	68.2	2.0	0.2	0.3	0.4
81926	23.0	75.5	0.9	0.2	0.2	0.1
81930	LA	LA	LA	LA	LA	LA
81941	35.1	62.0	2.3	0.4	0.1	0.1
81960	38.1	56.3	5.2	0.3	0.1	0.1
81961	28.6	68.9	2.0	0.1	0.3	0.2
81962	43.0	52.0	5.0	0.0	0.0	0.0
81972	25.5	71.5	2.2	0.3	0.2	0.3
81978	39.5	57.3	2.5	0.1	0.2	0.3
MEAN	31.6	64.4	3.5	0.2	0.2	0.2
S.D.	6.47	7.14	2.56	0.13	0.12	0.13
S.E.	1.95	2.15	0.77	0.04	0.04	0.04
N	11	11	11	11	11	11

LA = LAB ACCIDENT

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 7

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES DAY 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 100 MG/KG FEMALES								
81915	1.90	3.84	0.24	0.01	0.02	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81916	2.14	5.26	0.82	0.00	0.00	0.00	ADEQUATE	1-ANISO 2-POL
81917	2.13	5.27	0.14	0.01	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81921	1.70	4.01	0.12	0.01	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81926	2.29	7.51	0.09	0.02	0.02	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81930	LA	LA	LA	LA	LA	LA	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81941	1.76	3.11	0.12	0.02	0.00	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81960	2.38	3.53	0.32	0.02	0.01	0.00	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81961	2.01	4.85	0.14	0.00	0.02	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81962	3.11	3.76	0.36	0.00	0.00	0.00	ADEQUATE	1-ANISO 2-POL
81972	2.08	5.83	0.18	0.02	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81978	1.75	2.54	0.11	0.01	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	2.11	4.50	0.24	0.01	0.01	0.01		
S.D.	0.398	1.416	0.212	0.008	0.010	0.009		
S.E.	0.120	0.427	0.064	0.003	0.003	0.003		
N	11	11	11	11	11	11		

LA = LAB ACCIDENT

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, ANISO = ANISOCYTOSIS, POL = POLYCHROMIA

ANIMAL	PT	APTT	RDW	HDW
	seconds	seconds	%	g/dL
GROUP: 100 MG/KG FEMALES				
81915	18.3	16.0	14.6	2.43
81916	18.1	19.9	13.9	2.32
81917	16.9	15.4	18.3	2.64
81921	18.4	15.6	19.1	2.44
81926	17.6	11.3	24.5	2.64
81930	17.9	16.5	LA	LA
81941	18.4	17.5	15.6	2.58
81960	17.7	14.3	16.8	2.66
81961	17.2	14.7	15.2	2.39
81962	16.3	14.0	17.8	2.63
81972	18.3	17.0	14.8	2.44
81978	16.9	18.7	12.9	2.37
MEAN	17.7	15.9	16.7	2.50
S.D.	0.70	2.28	3.23	0.127
S.E.	0.20	0.66	0.97	0.038
N	12	12	11	11

LA = LAB ACCIDENT

g/dL = GRAMS/DECILITER

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE	MPV
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL	fL
GROUP: 300 MG/KG FEMALES											
81914	7.57	5.57	9.5	29.2	52.4	17.1	32.6	103.	3.6	202.6	8.90
81931	6.11	7.00	12.0	37.1	53.0	17.1	32.2	1390.	3.8	268.6	5.70
81934	8.54	7.07	12.3	39.5	55.8	17.4	31.2	1390.	5.0	351.4	5.90
81943	8.77	6.00	11.3	36.1	60.2	18.8	31.3	1192.	7.5	447.7	5.50
81946	6.02	6.47	12.0	38.8	60.0	18.6	30.9	902.	7.4	477.3	6.30
81957	10.95	7.36	12.7	41.5	56.4	17.2	30.5	845.	6.2	458.7	7.80
81959	3.81	6.99	12.2	39.2	56.1	17.4	31.1	1154.	3.9	271.9	5.80
81974	7.17	5.54	11.4	37.4	67.4	20.5	30.5	1316.	12.2	675.9	6.90
81976	6.82	7.00	12.5	38.5	54.9	17.8	32.4	1297.	4.3	301.7	6.90
81977	11.03	6.76	11.8	36.5	54.0	17.5	32.4	1048.	8.2	554.3	6.40
MEAN	7.68	6.58	11.8	37.4	57.0	17.9	31.5	1064.	6.2	401.0	6.61
S.D.	2.237	0.654	0.91	3.29	4.48	1.08	0.81	387.7	2.71	147.68	1.064
S.E.	0.708	0.207	0.29	1.04	1.42	0.34	0.26	122.6	0.86	46.70	0.336
N	10	10	10	10	10	10	10	10	10	10	10

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 300 MG/KG FEMALES						
81914	31.5	62.5	4.5	0.6	0.3	0.6
81931	27.0	73.0	0.0	0.0	0.0	0.0
81934	20.0	77.0	3.0	0.0	0.0	0.0
81943	21.9	74.4	2.8	0.2	0.4	0.3
81946	47.5	49.1	2.7	0.4	0.1	0.2
81957	25.4	69.4	3.5	0.7	0.3	0.7
81959	38.1	59.6	1.5	0.4	0.1	0.3
81974	31.3	64.4	3.4	0.3	0.3	0.2
81976	29.6	66.1	2.9	0.2	0.2	0.9
81977	34.3	62.6	1.9	0.5	0.2	0.5
MEAN	30.7	65.8	2.6	0.3	0.2	0.4
S.D.	8.07	8.20	1.24	0.24	0.14	0.30
S.E.	2.55	2.59	0.39	0.07	0.04	0.09
N	10	10	10	10	10	10

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 11

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES DAY 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 300 MG/KG FEMALES								
81914	2.38	4.73	0.34	0.05	0.02	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81931	1.65	4.46	0.00	0.00	0.00	0.00	ADEQUATE	1-HYPO 1-ANISO 2-POL
81934	1.71	6.58	0.26	0.00	0.00	0.00	ADEQUATE	2-HYPO 1-ANISO 2-POL
81943	1.92	6.52	0.25	0.02	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81946	2.86	2.95	0.16	0.02	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81957	2.78	7.60	0.39	0.08	0.03	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81959	1.45	2.27	0.06	0.01	0.00	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81974	2.24	4.62	0.25	0.02	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81976	2.02	4.51	0.20	0.02	0.01	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81977	3.79	6.90	0.21	0.05	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	2.28	5.11	0.21	0.03	0.01	0.03		
S.D.	0.706	1.746	0.117	0.025	0.012	0.025		
S.E.	0.223	0.552	0.037	0.008	0.004	0.008		
N	10	10	10	10	10	10		

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, 2 = MODERATE, HYPO = HYPOCHROMIA, ANISO = ANISOCYTOSIS, POL = POLYCHROMIA

ANIMAL	PT	APTT	RDW	HDW
	seconds	seconds	%	g/dL
GROUP: 300 MG/KG FEMALES				
81914	16.1	7.9	13.6	2.45
81931	16.1	18.3	15.5	2.63
81934	17.5	16.5	15.7	2.44
81943	18.5	14.6	20.4	2.51
81946	17.4	15.6	16.5	2.55
81957	17.6	15.8	15.5	2.55
81959	17.3	19.4	16.2	2.31
81974	17.1	16.3	27.5	2.88
81976	16.9	16.0	13.6	2.58
81977	18.0	17.2	15.4	2.39
MEAN	17.3	15.8	17.0	2.53
S.D.	0.75	3.09	4.14	0.156
S.E.	0.24	0.98	1.31	0.049
N	10	10	10	10

g/dL = GRAMS/DECILITER

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE	MPV
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL	fL
GROUP: 900 MG/KG FEMALES											
81918	5.87	6.26	10.9	32.8	52.4	17.4	33.2	1216.	9.1	569.7	6.30
81919	8.53	6.48	11.3	34.2	52.8	17.4	32.9	1139.	3.9	252.7	6.20
81927	5.32	6.94	11.8	34.7	50.0	17.0	34.1	1255.	3.7	254.9	5.50
81936	9.36	6.81	11.8	36.7	53.9	17.3	32.0	1100.	3.5	240.4	6.00
81937	6.89	7.64	13.4	40.6	53.1	17.5	32.9	1234.	1.4	109.3	6.20
81955	5.54	6.99	11.8	37.2	53.2	16.9	31.7	1296.	2.7	190.7	5.40
81968	7.65	7.06	12.2	38.3	54.2	17.3	32.0	1569.	5.2	366.7	5.80
81969	7.28	6.32	11.5	36.4	57.6	18.2	31.6	1032.	3.9	244.5	6.00
81973	11.01	6.82	12.0	37.7	55.3	17.6	31.9	1072.	4.6	314.1	5.80
81980	8.43	6.34	11.9	35.7	56.3	18.8	33.4	1286.	6.7	421.5	7.20
MEAN	7.59	6.77	11.9	36.4	53.9	17.5	32.6	1220.	4.5	296.5	6.04
S.D.	1.805	0.429	0.66	2.23	2.14	0.57	0.85	153.3	2.15	129.63	0.504
S.E.	0.571	0.136	0.21	0.71	0.68	0.18	0.27	48.5	0.68	40.99	0.159
N	10	10	10	10	10	10	10	10	10	10	10

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 900 MG/KG FEMALES						
81918	44.8	50.7	3.6	0.1	0.1	0.6
81919	25.2	70.4	2.8	1.1	0.3	0.1
81927	23.9	72.1	3.1	0.2	0.3	0.4
81936	21.5	75.0	2.6	0.2	0.3	0.4
81937	23.1	72.3	2.1	1.8	0.3	0.5
81955	35.3	60.8	3.4	0.1	0.2	0.2
81968	16.0	74.0	10.0	0.0	0.0	0.0
81969	51.0	39.0	10.0	0.0	0.0	0.0
81973	33.0	63.0	4.0	0.0	0.0	0.0
81980	24.0	71.1	4.1	0.1	0.2	0.5
MEAN	29.8	64.8	4.6	0.4	0.2	0.3
S.D.	11.10	11.80	2.93	0.60	0.13	0.24
S.E.	3.51	3.73	0.93	0.19	0.04	0.07
N	10	10	10	10	10	10

TABLE A72 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 15

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES DAY 4

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 900 MG/KG FEMALES								
81918	2.63	2.98	0.21	0.01	0.01	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81919	2.15	6.01	0.24	0.10	0.02	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81927	1.27	3.84	0.17	0.01	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81936	2.01	7.02	0.25	0.01	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81937	1.59	4.98	0.14	0.12	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81955	1.95	3.37	0.19	0.01	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
81968	1.22	5.66	0.77	0.00	0.00	0.00	ADEQUATE	1-HYPO 1-ANISO 1-PLT CLUM 2-POL
81969	3.71	2.84	0.73	0.00	0.00	0.00	ADEQUATE	2-POL
81973	3.63	6.94	0.44	0.00	0.00	0.00	ADEQUATE	1-HYPO 2-ANISO 3-POL
81980	2.03	5.99	0.34	0.01	0.02	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	2.22	4.96	0.35	0.03	0.01	0.02		
S.D.	0.871	1.599	0.229	0.044	0.011	0.017		
S.E.	0.276	0.506	0.072	0.014	0.003	0.005		
N	10	10	10	10	10	10		

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, 2 = MODERATE, HYPO = HYPOCHROMIA, ANISO = ANISOCYTOSIS, PLT CLUM = PLATELET CLUMPS, POL = POLYCHROMIA

ANIMAL	PT	APTT	RDW	HDW
	seconds	seconds	%	g/dL
GROUP: 900 MG/KG FEMALES				
81918	17.0	13.0	16.6	2.60
81919	16.9	13.5	13.7	2.26
81927	18.7	15.5	14.7	2.67
81936	16.5	14.1	14.6	2.37
81937	17.3	11.5	12.4	2.31
81955	18.2	16.3	14.5	2.39
81968	17.5	13.6	15.9	2.78
81969	16.1	14.1	15.2	2.56
81973	17.9	14.3	18.4	2.53
81980	17.4	12.7	16.8	2.81
MEAN	17.4	13.9	15.3	2.53
S.D.	0.78	1.37	1.71	0.192
S.E.	0.25	0.43	0.54	0.061
N	10	10	10	10

g/dL = GRAMS/DECILITER

TABLE A73 (F0 FEMALES - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE	PLATELET VOLUME
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL	fL
GROUP: 0 MG/KG FEMALES											
81932	12.44	8.77	14.4	45.2	51.5	16.4	31.9	944.	1.4	120.8	5.90
81966	9.87	8.89	15.4	46.1	51.8	17.3	33.3	1024.	1.2	108.6	5.30
81971	9.12	8.11	15.1	44.7	55.0	18.7	33.9	1122.	1.1	85.4	5.60
MEAN	10.48	8.59	15.0	45.3	52.8	17.5	33.0	1030.	1.2	104.9	5.60
S.D.	1.741	0.420	0.51	0.71	1.94	1.16	1.03	89.2	0.15	17.98	0.300
S.E.	1.005	0.242	0.30	0.41	1.12	0.67	0.59	51.5	0.09	10.38	0.173
N	3	3	3	3	3	3	3	3	3	3	3

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A73 (F0 FEMALES - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 0 MG/KG FEMALES						
81932	14.6	81.6	1.9	0.8	0.4	0.7
81966	13.2	83.5	1.5	1.0	0.5	0.4
81971	11.4	84.6	2.4	0.7	0.3	0.6
MEAN	13.1	83.2	1.9	0.8	0.4	0.6
S.D.	1.60	1.52	0.45	0.15	0.10	0.15
S.E.	0.93	0.88	0.26	0.09	0.06	0.09
N	3	3	3	3	3	3

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL
GROUP: 0 MG/KG FEMALES						
81932	1.82	10.15	0.23	0.10	0.05	0.08
81966	1.30	8.23	0.15	0.10	0.05	0.04
81971	1.04	7.71	0.22	0.07	0.03	0.05
MEAN	1.39	8.70	0.20	0.09	0.04	0.06
S.D.	0.397	1.285	0.044	0.017	0.012	0.021
S.E.	0.229	0.742	0.025	0.010	0.007	0.012
N	3	3	3	3	3	3

thous/uL = THOUSANDS/MICROLITER

ANIMAL	PT	APTT	RDW	HDW
	seconds	seconds	%	g/dL
GROUP: 0 MG/KG FEMALES				
81932	18.6	16.1	11.2	2.28
81966	18.2	16.4	10.9	2.32
81971	17.0	17.7	11.2	2.23
MEAN	17.9	16.7	11.1	2.28
S.D.	0.83	0.85	0.17	0.045
S.E.	0.48	0.49	0.10	0.026
N	3	3	3	3

g/dL = GRAMS/DECILITER

TABLE A74 (F0 FEMALES - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE	PLATELET VOLUME
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL	fL
GROUP: 300 MG/KG FEMALES											
81945	2.62	8.72	15.2	45.0	51.7	17.4	33.7	777.	1.1	91.5	5.90
81947	5.41	8.36	14.4	42.4	50.8	17.2	33.9	925.	1.2	101.0	5.70
MEAN	4.02	8.54	14.8	43.7	51.3	17.3	33.8	851.	1.2	96.3	5.80
S.D.	1.973	0.255	0.57	1.84	0.64	0.14	0.14	104.7	0.07	6.72	0.141
S.E.	1.395	0.180	0.40	1.30	0.45	0.10	0.10	74.0	0.05	4.75	0.100
N	2	2	2	2	2	2	2	2	2	2	2

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A74 (F0 FEMALES - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 300 MG/KG FEMALES						
81945	25.3	70.7	2.0	1.7	0.2	0.1
81947	18.7	77.9	1.9	1.1	0.2	0.2
MEAN	22.0	74.3	2.0	1.4	0.2	0.2
S.D.	4.67	5.09	0.07	0.42	0.00	0.07
S.E.	3.30	3.60	0.05	0.30	0.00	0.05
N	2	2	2	2	2	2

TABLE A74 (F0 FEMALES - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL
GROUP: 300 MG/KG FEMALES						
81945	0.66	1.85	0.05	0.04	0.00	0.00
81947	1.01	4.21	0.10	0.06	0.01	0.01
MEAN	0.84	3.03	0.08	0.05	0.01	0.01
S.D.	0.247	1.669	0.035	0.014	0.007	0.007
S.E.	0.175	1.180	0.025	0.010	0.005	0.005
N	2	2	2	2	2	2

thous/uL = THOUSANDS/MICROLITER

ANIMAL	PT	APTT	RDW	HDW
	seconds	seconds	%	g/dL
GROUP: 300 MG/KG FEMALES				
81945	17.6	14.2	10.9	2.41
81947	17.8	17.6	10.6	2.18
MEAN	17.7	15.9	10.8	2.30
S.D.	0.14	2.40	0.21	0.163
S.E.	0.10	1.70	0.15	0.115
N	2	2	2	2

g/dL = GRAMS/DECILITER

TABLE A75 (F0 FEMALES - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES TLL

ANIMAL	WBC	RBC	HGB	HCT	MCV	MCH	MCHC	PLATELET	RETIC	RETIC ABSOLUTE	PLATELET VOLUME
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	%	thous/uL	fL
GROUP: 900 MG/KG FEMALES											
81951	16.58	5.54	10.2	33.0	59.5	18.3	30.8	1516.	10.9	602.4	6.60
MEAN	16.58	5.54	10.2	33.0	59.5	18.3	30.8	1516.	10.9	602.4	6.60
S.D.	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.000
S.E.	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.000
N	1	1	1	1	1	1	1	1	1	1	1

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

ANIMAL	NEU	LYMPH	MONO	EOS	BASO	LUC
	%	%	%	%	%	%
GROUP: 900 MG/KG FEMALES						
81951	29.0	57.0	14.0	0.0	0.0	0.0
MEAN	29.0	57.0	14.0	0.0	0.0	0.0
S.D.	0.00	0.00	0.00	0.00	0.00	0.00
S.E.	0.00	0.00	0.00	0.00	0.00	0.00
N	1	1	1	1	1	1

TABLE A75 (F0 FEMALES - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL HEMATOLOGY VALUES TLL

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY		
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL				
GROUP: 900 MG/KG FEMALES										
81951	4.81	9.45	2.32	0.00	0.00	0.00	INCREASE	1-HYPO	2-ANISO	1-PLT CLUM
MEAN	4.81	9.45	2.32	0.00	0.00	0.00				
S.D.	0.000	0.000	0.000	0.000	0.000	0.000				
S.E.	0.000	0.000	0.000	0.000	0.000	0.000				
N	1	1	1	1	1	1				

thous/uL = THOUSANDS/MICROLITER

------ MORPHOLOGY CODE ------

1 = FEW, 2 = MODERATE, HYPO = HYPOCHROMIA, ANISO = ANISOCYTOSIS, PLT CLUM = PLATELET CLUMPS

ANIMAL	PT	APTT	RDW	HDW
	seconds	seconds	%	g/dL
GROUP: 900 MG/KG FEMALES				
81951	17.9	13.7	27.2	3.05
MEAN	17.9	13.7	27.2	3.05
S.D.	0.00	0.00	0.00	0.000
S.E.	0.00	0.00	0.00	0.000
N	1	1	1	1

g/dL = GRAMS/DECILITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 4

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 MG/KG MALES											
81988	4.4	6.6	2.1	2.07	0.18	10.4	0.3	160.	47.	139.	1.8
81989	4.8	6.8	2.0	2.40	0.25	10.3	0.3	132.	33.	99.	0.2
81991	4.4	6.8	2.4	1.87	0.22	10.1	0.4	131.	39.	126.	0.4
81996	4.3	6.3	2.0	2.08	0.19	9.6	0.1	125.	36.	107.	0.1
81997	4.7	6.8	2.1	2.25	0.24	13.6	0.3	120.	30.	83.	0.1
81998	4.2	6.5	2.2	1.91	0.21	12.1	0.3	106.	30.	89.	0.1
82014	4.3	7.0	2.6	1.66	0.21	14.9	0.4	88.	30.	82.	0.1
82020	4.1	6.3	2.3	1.81	0.17	10.2	0.3	116.	29.	81.	0.1
82021	4.4	6.4	2.1	2.09	0.20	10.8	0.4	167.	38.	124.	0.1
82025	4.3	6.5	2.2	1.96	0.22	11.4	0.3	98.	32.	77.	0.1
82038	4.3	6.7	2.4	1.83	0.22	8.6	0.2	115.	30.	75.	0.1
82041	4.3	6.3	2.0	2.12	0.23	9.8	0.2	139.	36.	80.	0.3
MEAN	4.4	6.6	2.2	2.00	0.21	11.0	0.3	125.	34.	97.	0.3
S.D.	0.20	0.24	0.19	0.205	0.024	1.78	0.09	23.2	5.3	22.1	0.49
S.E.	0.06	0.07	0.06	0.059	0.007	0.51	0.03	6.7	1.5	6.4	0.14
N	12	12	12	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 2
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 4

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 MG/KG		MALES						
81988	96.	79.	11.5	105.	8.7	5.46	149.	39.
81989	116.	39.	11.7	104.	8.9	4.81	151.	29.
81991	96.	33.	11.4	105.	9.3	5.91	150.	44.
81996	127.	52.	10.0	102.	7.3	4.72	144.	49.
81997	122.	66.	11.8	102.	7.4	4.57	145.	57.
81998	129.	35.	10.8	104.	7.0	4.87	144.	31.
82014	116.	50.	11.6	103.	7.9	4.84	146.	41.
82020	121.	61.	11.2	103.	7.4	5.19	143.	47.
82021	116.	45.	11.0	103.	8.7	5.91	146.	40.
82025	129.	39.	11.4	105.	6.7	4.30	146.	41.
82038	144.	48.	11.8	103.	7.4	4.45	144.	67.
82041	120.	49.	11.3	104.	7.2	4.69	147.	39.
MEAN	119.	50.	11.3	104.	7.8	4.98	146.	44.
S.D.	13.4	13.5	0.51	1.1	0.85	0.533	2.6	10.5
S.E.	3.9	3.9	0.15	0.3	0.25	0.154	0.7	3.0
N	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 3

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 4

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 100 MG/KG		MALES									
81982	4.2	6.2	2.1	2.00	0.19	10.7	0.3	86.	42.	167.	0.1
81987	4.5	6.4	1.9	2.37	0.17	12.4	0.2	161.	46.	122.	0.1
81994	4.1	6.3	2.2	1.86	0.23	9.5	0.2	99.	32.	94.	0.1
82001	4.0	6.1	2.2	1.82	0.18	11.5	0.3	152.	32.	81.	0.1
82003	4.2	6.2	2.0	2.15	0.20	11.2	0.3	172.	70.	109.	0.1
82007	4.4	6.6	2.2	2.00	0.17	11.5	0.3	122.	25.	78.	0.1
82011	4.4	6.7	2.3	1.97	0.22	10.9	0.3	141.	40.	90.	0.1
82016	4.3	6.2	2.0	2.19	0.20	11.0	0.3	157.	33.	100.	1.0
82022	4.4	6.6	2.1	2.09	0.20	12.2	0.4	130.	31.	82.	0.1
82024	4.4	6.7	2.2	1.97	0.22	11.3	0.3	136.	34.	87.	0.6
82034	4.3	6.5	2.2	1.93	0.26	11.5	0.3	174.	38.	100.	0.7
82046	4.5	6.2	1.8	2.50	0.22	8.5	0.3	109.	26.	69.	0.1
MEAN	4.3	6.4	2.1	2.07	0.21	11.0	0.3	137.	37.	98.	0.3
S.D.	0.16	0.22	0.15	0.203	0.026	1.08	0.05	28.5	12.0	26.0	0.31
S.E.	0.05	0.06	0.04	0.059	0.008	0.31	0.01	8.2	3.5	7.5	0.09
N	12	12	12	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 100 MG/KG		MALES						
81982	93.	50.	11.0	104.	8.1	4.93	149.	33.
81987	107.	40.	11.2	104.	8.0	5.19	148.	52.
81994	119.	49.	10.5	103.	7.2	5.03	143.	47.
82001	120.	51.	10.9	103.	6.9	3.98	145.	38.
82003	141.	43.	11.0	104.	6.4	4.28	144.	59.
82007	97.	32.	11.4	103.	7.5	4.69	149.	39.
82011	120.	55.	11.4	105.	7.1	4.54	146.	35.
82016	123.	57.	11.3	103.	7.8	5.33	147.	40.
82022	117.	40.	11.3	105.	7.9	5.04	145.	35.
82024	120.	40.	11.4	104.	6.8	4.43	146.	45.
82034	110.	41.	11.7	104.	8.0	5.44	147.	57.
82046	146.	47.	11.8	105.	6.8	4.43	146.	52.
MEAN	118.	45.	11.2	104.	7.4	4.78	146.	44.
S.D.	15.4	7.3	0.36	0.8	0.58	0.453	1.9	9.0
S.E.	4.4	2.1	0.10	0.2	0.17	0.131	0.5	2.6
N	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 4

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 300 MG/KG		MALES									
81993	4.2	6.4	2.2	1.87	0.24	10.6	0.4	157.	32.	99.	0.1
81995	4.7	6.9	2.2	2.09	0.14	11.5	0.3	184.	36.	86.	0.1
82000	4.4	6.4	2.0	2.19	0.23	11.2	0.3	160.	30.	85.	1.4
82002	4.2	6.4	2.3	1.84	0.16	11.4	0.3	140.	35.	105.	0.1
82005	4.4	6.5	2.1	2.08	0.18	11.1	0.3	147.	36.	96.	1.4
82013	4.2	6.6	2.4	1.73	0.20	9.4	0.3	172.	43.	100.	0.1
82015	4.3	6.2	1.9	2.21	0.20	13.6	0.3	120.	33.	72.	0.5
82023	4.4	6.6	2.2	1.98	0.21	10.5	0.2	156.	20.	77.	0.1
82031	4.2	6.3	2.1	2.01	0.22	8.7	0.4	144.	42.	101.	0.1
82036	4.2	6.6	2.5	1.68	0.18	10.6	0.3	96.	29.	82.	0.1
82039	4.1	6.2	2.2	1.89	0.18	10.7	0.3	108.	37.	110.	0.1
82044	4.2	6.4	2.2	1.93	0.21	7.9	0.2	162.	39.	112.	0.1
MEAN	4.3	6.5	2.2	1.96	0.20	10.6	0.3	146.	34.	94.	0.4
S.D.	0.16	0.20	0.16	0.168	0.029	1.46	0.06	26.0	6.2	13.1	0.50
S.E.	0.05	0.06	0.05	0.048	0.008	0.42	0.02	7.5	1.8	3.8	0.15
N	12	12	12	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 4

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 300 MG/KG		MALES						
81993	108.	57.	10.7	102.	7.5	4.89	145.	48.
81995	119.	47.	11.8	104.	7.1	4.18	147.	62.
82000	119.	37.	11.4	104.	7.3	4.74	149.	39.
82002	114.	38.	11.3	104.	7.8	5.28	150.	49.
82005	119.	46.	11.3	104.	8.4	4.92	149.	57.
82013	123.	38.	10.9	103.	6.1	4.33	144.	54.
82015	111.	61.	11.6	103.	7.7	4.30	146.	70.
82023	112.	48.	11.4	101.	6.6	5.07	144.	63.
82031	109.	43.	10.6	103.	6.4	4.78	146.	42.
82036	129.	54.	11.5	102.	6.9	4.27	145.	26.
82039	98.	43.	11.4	104.	7.5	5.07	148.	46.
82044	107.	36.	11.6	104.	6.9	4.73	146.	65.
MEAN	114.	46.	11.3	103.	7.2	4.71	147.	52.
S.D.	8.3	8.2	0.37	1.0	0.65	0.364	2.0	12.6
S.E.	2.4	2.4	0.11	0.3	0.19	0.105	0.6	3.6
N	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 7

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 4

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 900 MG/KG		MALES									
82006	4.4	6.7	2.3	1.92	0.20	9.2	0.4	121.	37.	96.	0.1
82009	4.4	6.6	2.2	2.01	0.18	10.6	0.3	150.	39.	118.	0.6
82010	4.4	6.4	2.0	2.21	0.18	9.6	0.4	192.	30.	92.	0.1
82018	4.3	6.3	2.0	2.16	0.21	10.7	0.4	149.	42.	78.	0.1
82028	4.4	6.7	2.3	1.90	0.22	13.1	0.4	143.	39.	104.	0.1
82029	4.3	6.3	2.1	2.08	0.21	8.7	0.4	115.	42.	132.	0.1
82030	4.5	6.9	2.4	1.88	0.17	10.6	0.4	131.	38.	99.	0.1
82035	4.4	6.4	2.0	2.17	0.20	10.0	0.3	120.	46.	69.	0.1
82037	4.5	6.7	2.2	2.10	0.19	9.5	0.4	194.	42.	116.	0.8
82040	4.2	6.4	2.2	1.93	0.20	9.6	0.4	126.	58.	90.	0.9
82042	4.8	7.0	2.2	2.16	0.32	10.6	0.4	220.	45.	84.	2.6
82043	4.7	6.6	1.9	2.41	0.16	12.5	0.5	164.	46.	91.	0.6
MEAN	4.4	6.6	2.2	2.08	0.20	10.4	0.4	152.	42.	97.	0.5
S.D.	0.17	0.23	0.15	0.157	0.041	1.30	0.05	34.0	6.7	17.8	0.73
S.E.	0.05	0.07	0.04	0.045	0.012	0.37	0.01	9.8	1.9	5.2	0.21
N	12	12	12	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A76 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 8
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 4

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 900 MG/KG		MALES						
82006	112.	39.	10.9	99.	6.2	4.51	142.	46.
82009	116.	58.	11.3	104.	7.5	5.51	147.	33.
82010	140.	42.	11.5	102.	7.4	4.83	144.	55.
82018	110.	53.	11.2	102.	6.3	4.57	144.	40.
82028	90.	47.	11.6	102.	8.6	4.83	149.	29.
82029	108.	45.	10.9	104.	6.8	4.49	146.	38.
82030	95.	73.	11.8	101.	7.9	4.64	144.	42.
82035	118.	67.	11.8	102.	7.8	4.59	146.	27.
82037	108.	54.	10.8	102.	8.3	4.65	148.	41.
82040	122.	56.	11.3	101.	6.3	4.29	146.	24.
82042	105.	44.	11.5	102.	7.2	4.82	146.	28.
82043	142.	50.	11.7	102.	7.6	4.60	147.	30.
MEAN	114.	52.	11.4	102.	7.3	4.69	146.	36.
S.D.	15.5	10.1	0.35	1.3	0.79	0.301	2.0	9.2
S.E.	4.5	2.9	0.10	0.4	0.23	0.087	0.6	2.6
N	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PCHEv4.05
12/10/2010

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 MG/KG FEMALES											
81920	4.2	6.2	2.0	2.09	0.15	10.2	0.3	151.	52.	100.	0.7
81938	4.5	6.4	1.9	2.33	0.14	12.7	0.3	103.	59.	111.	0.1
81939	4.2	6.4	2.2	1.94	0.14	11.9	0.3	126.	63.	126.	1.2
81942	4.4	6.1	1.7	2.58	0.17	12.2	0.3	125.	72.	146.	0.1
81950	4.3	6.4	2.1	2.07	0.17	12.3	0.4	133.	71.	176.	0.5
81958	4.6	6.6	1.9	2.39	0.18	7.1	0.3	89.	68.	97.	0.8
81967	4.1	6.4	2.2	1.87	0.15	11.3	0.3	75.	62.	107.	0.1
81975	3.9	5.7	1.9	2.06	0.17	12.0	0.3	94.	69.	103.	0.5
81979	4.5	6.1	1.6	2.74	0.19	8.6	0.4	79.	50.	100.	0.8
MEAN	4.3	6.3	1.9	2.23	0.16	10.9	0.3	108.	63.	118.	0.5
S.D.	0.22	0.27	0.21	0.297	0.018	1.92	0.04	26.5	8.0	26.7	0.38
S.E.	0.07	0.09	0.07	0.099	0.006	0.64	0.01	8.8	2.7	8.9	0.13
N	9	9	9	9	9	9	9	9	9	9	9

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES DAY 4

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 MG/KG FEMALES								
81920	109.	64.	10.1	102.	3.4	4.07	142.	37.
81938	106.	81.	10.8	104.	3.3	4.65	141.	39.
81939	111.	62.	9.8	102.	3.9	3.95	143.	60.
81942	113.	82.	10.6	104.	4.2	4.63	144.	41.
81950	138.	53.	11.2	104.	4.6	3.81	144.	49.
81958	117.	95.	10.7	100.	3.4	4.02	141.	50.
81967	116.	72.	11.0	102.	3.4	4.00	140.	41.
81975	124.	55.	10.3	103.	4.2	3.91	143.	31.
81979	102.	61.	10.7	102.	5.1	4.05	143.	35.
MEAN	115.	69.	10.6	103.	3.9	4.12	142.	43.
S.D.	10.7	14.1	0.44	1.3	0.63	0.305	1.4	8.9
S.E.	3.6	4.7	0.15	0.4	0.21	0.102	0.5	3.0
N	9	9	9	9	9	9	9	9

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 100 MG/KG FEMALES											
81915	4.4	6.6	2.2	2.00	0.19	8.2	0.3	101.	98.	185.	0.1
81916	4.4	6.8	2.4	1.87	0.17	12.2	0.3	147.	75.	115.	0.6
81917	4.1	5.9	1.8	2.29	0.21	9.2	0.3	148.	97.	117.	0.1
81921	4.1	5.9	1.8	2.32	0.15	13.0	0.4	88.	72.	137.	0.1
81926	4.7	6.8	2.1	2.23	0.14	14.4	0.3	120.	76.	102.	0.1
81930	4.7	6.5	1.8	2.55	0.18	8.6	0.3	92.	57.	99.	0.1
81941	4.2	6.2	2.0	2.16	0.13	11.5	0.4	128.	77.	168.	0.1
81960	4.3	5.8	1.5	2.76	0.18	10.9	0.3	99.	79.	148.	0.1
81961	4.3	6.6	2.3	1.84	0.16	11.7	0.4	112.	93.	121.	0.1
81962	3.8	5.6	1.8	2.13	0.14	9.0	0.3	84.	77.	116.	0.1
81972	4.0	5.7	1.7	2.34	0.05	9.4	0.3	195.	92.	122.	0.1
81978	4.2	6.1	1.9	2.17	0.18	7.2	0.3	109.	90.	158.	0.4
MEAN	4.3	6.2	1.9	2.22	0.16	10.4	0.3	119.	82.	132.	0.2
S.D.	0.26	0.44	0.26	0.263	0.041	2.17	0.05	32.0	12.2	27.0	0.16
S.E.	0.08	0.13	0.08	0.076	0.012	0.63	0.01	9.2	3.5	7.8	0.05
N	12	12	12	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES DAY 4

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 100 MG/KG FEMALES								
81915	126.	68.	10.6	102.	4.9	4.38	143.	40.
81916	126.	61.	10.9	101.	5.1	4.53	140.	42.
81917	125.	76.	10.9	105.	3.9	4.00	145.	44.
81921	126.	71.	10.4	104.	4.1	4.67	142.	43.
81926	127.	80.	10.8	104.	5.2	4.66	143.	53.
81930	112.	59.	11.4	101.	5.6	4.21	143.	44.
81941	94.	67.	10.1	103.	4.0	4.58	143.	36.
81960	94.	55.	10.0	105.	6.0	4.48	144.	25.
81961	123.	73.	11.1	105.	5.0	4.72	145.	47.
81962	113.	62.	10.2	103.	3.9	4.08	141.	36.
81972	122.	43.	10.5	103.	2.7	4.22	141.	294.
81978	132.	57.	10.5	106.	3.9	4.02	144.	32.
MEAN	118.	64.	10.6	104.	4.5	4.38	143.	61.
S.D.	12.7	10.3	0.42	1.6	0.93	0.264	1.6	73.6
S.E.	3.7	3.0	0.12	0.5	0.27	0.076	0.5	21.3
N	12	12	12	12	12	12	12	12

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 300 MG/KG FEMALES											
81914	3.7	5.8	2.1	1.77	0.12	16.6	0.4	93.	63.	129.	0.4
81931	4.7	6.8	2.0	2.33	0.18	11.4	0.4	31.	49.	80.	0.1
81934	4.3	6.3	2.0	2.09	0.11	17.2	0.4	122.	67.	98.	0.1
81943	4.3	6.2	1.9	2.29	0.13	11.7	0.4	120.	61.	94.	0.1
81946	4.3	6.4	2.1	2.09	0.17	9.3	0.5	139.	85.	113.	0.1
81957	3.9	5.7	1.7	2.28	0.19	9.3	0.3	63.	143.	185.	0.2
81959	4.4	6.5	2.1	2.15	0.13	10.2	0.3	59.	82.	123.	0.2
81974	4.6	6.8	2.2	2.09	0.12	10.1	0.3	85.	64.	122.	0.3
81976	4.3	6.2	1.9	2.21	0.18	11.8	0.4	86.	91.	109.	0.1
81977	4.1	6.4	2.3	1.80	0.14	12.2	0.3	166.	66.	140.	1.3
MEAN	4.3	6.3	2.0	2.11	0.15	12.0	0.4	96.	77.	119.	0.3
S.D.	0.30	0.36	0.17	0.193	0.030	2.79	0.07	40.7	26.4	29.1	0.37
S.E.	0.09	0.11	0.05	0.061	0.009	0.88	0.02	12.9	8.3	9.2	0.12
N	10	10	10	10	10	10	10	10	10	10	10

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 300 MG/KG	FEMALES							
81914	133.	76.	11.2	110.	7.3	6.26	148.	40.
81931	110.	78.	11.0	102.	3.2	4.18	142.	45.
81934	119.	56.	11.9	105.	6.1	4.43	145.	38.
81943	123.	73.	11.3	105.	3.6	4.17	145.	59.
81946	124.	82.	10.8	104.	3.6	3.94	144.	46.
81957	127.	76.	10.4	106.	7.7	5.49	145.	54.
81959	101.	57.	10.7	100.	4.6	4.20	142.	26.
81974	135.	55.	11.6	104.	5.8	5.37	140.	27.
81976	122.	64.	10.7	104.	4.5	4.58	144.	42.
81977	137.	65.	11.4	101.	7.3	5.08	141.	34.
MEAN	123.	68.	11.1	104.	5.4	4.77	144.	41.
S.D.	11.2	10.0	0.46	2.8	1.70	0.750	2.4	10.6
S.E.	3.5	3.2	0.15	0.9	0.54	0.237	0.7	3.4
N	10	10	10	10	10	10	10	10

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES DAY 4

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 900 MG/KG FEMALES											
81918	5.0	7.1	2.1	2.42	0.14	13.2	0.3	85.	55.	111.	0.1
81919	4.8	6.8	2.0	2.40	0.15	20.3	0.5	77.	43.	86.	0.1
81927	4.4	6.4	2.0	2.15	0.15	13.3	0.3	102.	54.	72.	1.4
81936	4.1	6.2	2.1	1.94	0.15	9.5	0.3	86.	71.	105.	2.0
81937	4.5	6.7	2.2	2.00	0.14	10.1	0.4	126.	70.	97.	0.1
81955	4.5	6.4	1.9	2.44	0.15	10.6	0.3	138.	81.	117.	1.9
81968	4.9	7.2	2.2	2.21	0.17	7.1	0.2	87.	45.	77.	0.4
81969	5.0	7.2	2.2	2.26	0.17	16.6	0.4	169.	232.	227.	0.1
81973	4.9	6.6	1.7	2.90	0.11	13.2	0.2	159.	58.	117.	0.4
81980	4.6	6.7	2.1	2.22	0.15	12.4	0.3	109.	68.	95.	0.2
MEAN	4.7	6.7	2.1	2.29	0.15	12.6	0.3	114.	78.	110.	0.7
S.D.	0.30	0.35	0.16	0.271	0.017	3.75	0.09	32.8	55.5	43.9	0.78
S.E.	0.09	0.11	0.05	0.086	0.005	1.19	0.03	10.4	17.6	13.9	0.25
N	10	10	10	10	10	10	10	10	10	10	10

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A77 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 900 MG/KG	FEMALES							
81918	129.	113.	11.5	101.	5.0	4.29	142.	43.
81919	124.	75.	11.5	104.	5.2	4.92	143.	39.
81927	138.	94.	12.7	101.	3.6	4.46	141.	37.
81936	115.	87.	11.2	101.	7.0	4.42	144.	29.
81937	133.	60.	11.3	100.	6.5	4.99	139.	34.
81955	120.	97.	10.9	104.	4.1	4.55	142.	33.
81968	136.	121.	12.2	102.	6.6	5.11	141.	56.
81969	134.	72.	11.0	103.	5.3	4.52	141.	38.
81973	137.	75.	12.0	102.	7.1	4.53	141.	43.
81980	136.	91.	11.1	101.	4.7	4.30	141.	67.
MEAN	130.	89.	11.5	102.	5.5	4.61	142.	42.
S.D.	8.0	18.9	0.58	1.4	1.23	0.292	1.4	11.5
S.E.	2.5	6.0	0.18	0.4	0.39	0.092	0.4	3.6
N	10	10	10	10	10	10	10	10

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PCHEv4.05
12/10/2010

TABLE A78 (F0 FEMALES - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 MG/KG FEMALES											
81932	5.0	7.0	2.0	2.44	0.15	11.6	0.3	86.	37.	101.	1.4
81966	4.7	6.6	2.0	2.41	0.09	10.9	0.3	94.	34.	71.	0.7
81971	5.3	7.5	2.2	2.44	0.17	11.1	0.3	72.	38.	85.	1.0
MEAN	5.0	7.0	2.1	2.43	0.14	11.2	0.3	84.	36.	86.	1.0
S.D.	0.30	0.45	0.12	0.017	0.042	0.36	0.00	11.1	2.1	15.0	0.35
S.E.	0.17	0.26	0.07	0.010	0.024	0.21	0.00	6.4	1.2	8.7	0.20
N	3	3	3	3	3	3	3	3	3	3	3

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 MG/KG FEMALES								
81932	148.	59.	12.1	103.	7.8	4.54	144.	44.
81966	146.	56.	11.7	103.	7.6	3.90	146.	41.
81971	140.	69.	12.1	104.	7.0	4.21	143.	41.
MEAN	145.	61.	12.0	103.	7.5	4.22	144.	42.
S.D.	4.2	6.8	0.23	0.6	0.42	0.320	1.5	1.7
S.E.	2.4	3.9	0.13	0.3	0.24	0.185	0.9	1.0
N	3	3	3	3	3	3	3	3

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A79 (F0 FEMALES - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 300 MG/KG FEMALES											
81945	4.7	7.0	2.3	2.10	0.16	14.8	0.4	72.	60.	87.	0.4
81947	4.8	6.9	2.1	2.23	0.16	12.5	0.4	92.	46.	74.	0.3
MEAN	4.8	7.0	2.2	2.17	0.16	13.7	0.4	82.	53.	81.	0.4
S.D.	0.07	0.07	0.14	0.092	0.000	1.63	0.00	14.1	9.9	9.2	0.07
S.E.	0.05	0.05	0.10	0.065	0.000	1.15	0.00	10.0	7.0	6.5	0.05
N	2	2	2	2	2	2	2	2	2	2	2

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A79 (F0 FEMALES - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID — PAGE 2

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL SERUM CHEMISTRY VALUES — PCD 25

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 300 MG/KG FEMALES								
81945	174.	72.	11.0	102.	5.4	4.11	142.	69.
81947	152.	94.	11.4	102.	5.5	4.69	143.	41.
MEAN	163.	83.	11.2	102.	5.5	4.40	143.	55.
S.D.	15.6	15.6	0.28	0.0	0.07	0.410	0.7	19.8
S.E.	11.0	11.0	0.20	0.0	0.05	0.290	0.5	14.0
N	2	2	2	2	2	2	2	2

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PCHEv4.05
12/10/2010
R:01/10/2011

TABLE A80 (F0 FEMALES - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SERUM CHEMISTRY VALUES TLL

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALP	ALT	AST	GGT
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 900 MG/KG FEMALES											
81951	5.2	7.1	1.9	2.70	0.14	13.4	0.3	91.	45.	99.	0.7
MEAN	5.2	7.1	1.9	2.70	0.14	13.4	0.3	91.	45.	99.	0.7
S.D.	0.00	0.00	0.00	0.000	0.000	0.00	0.00	0.0	0.0	0.0	0.00
S.E.	0.00	0.00	0.00	0.000	0.000	0.00	0.00	0.0	0.0	0.0	0.00
N	1	1	1	1	1	1	1	1	1	1	1

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 900 MG/KG FEMALES								
81951	140.	88.	12.8	102.	7.8	5.13	143.	70.
MEAN	140.	88.	12.8	102.	7.8	5.13	143.	70.
S.D.	0.0	0.0	0.00	0.0	0.00	0.000	0.0	0.0
S.E.	0.0	0.0	0.00	0.0	0.00	0.000	0.0	0.0
N	1	1	1	1	1	1	1	1

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A81 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0 MG/KG MALES	
81988	8.0
81989	16.4
81991	14.0
81996	12.9
81997	7.6
81998	7.5
82014	17.1
82020	10.5
82021	44.4
82025	7.0
82038	24.0
82041	8.0
MEAN	14.8
S.D.	10.66
S.E.	3.08
N	12

umol/L = micromoles/Liter

TABLE A81 (F0 MALES)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 100 MG/KG MALES	
81982	11.3
81987	34.2
81994	8.6
82001	14.6
82003	13.8
82007	7.5
82011	19.7
82016	4.6
82022	13.1
82024	13.5
82034	3.4
82046	14.5
MEAN	13.2
S.D.	8.06
S.E.	2.33
N	12

umol/L = micromoles/Liter

ANIMAL	BILE ACIDS
	umol/L
GROUP: 300 MG/KG MALES	
81993	11.5
81995	18.6
82000	3.7
82002	12.9
82005	10.2
82013	4.1
82015	4.3
82023	9.4
82031	4.7
82036	16.6
82039	10.8
82044	5.0
MEAN	9.3
S.D.	5.08
S.E.	1.47
N	12

umol/L = micromoles/Liter

ANIMAL	BILE ACIDS
	umol/L
GROUP: 900 MG/KG MALES	
82006	3.2
82009	4.1
82010	8.2
82018	6.0
82028	11.7
82029	4.3
82030	48.1
82035	12.8
82037	4.4
82040	9.2
82042	6.1
82043	7.8
MEAN	10.5
S.D.	12.23
S.E.	3.53
N	12

umol/L = micromoles/Liter

TABLE A82 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SPECIAL CHEMISTRY VALUES

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0 MG/KG FEMALES	
81920	19.1
81938	36.2
81939	37.6
81942	42.5
81950	32.9
81958	20.1
81967	11.9
81975	28.9
81979	30.0
MEAN	28.8
S.D.	9.96
S.E.	3.32
N	9

umol/L = micromoles/Liter

TABLE A82 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SPECIAL CHEMISTRY VALUES DAY 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 100 MG/KG FEMALES	
81915	36.7
81916	33.7
81917	21.0
81921	14.8
81926	31.0
81930	16.6
81941	20.6
81960	20.4
81961	32.8
81962	11.0
81972	23.2
81978	18.3
MEAN	23.3
S.D.	8.27
S.E.	2.39
N	12

umol/L = micromoles/Liter

ANIMAL	BILE ACIDS
	umol/L
GROUP: 300 MG/KG FEMALES	
81914	9.4
81931	13.6
81934	42.7
81943	19.1
81946	54.6
81957	29.6
81959	14.1
81974	18.1
81976	61.9
81977	28.7
MEAN	29.2
S.D.	18.21
S.E.	5.76
N	10

umol/L = micromoles/Liter

TABLE A82 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SPECIAL CHEMISTRY VALUES DAY 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 900 MG/KG FEMALES	
81918	19.8
81919	22.7
81927	82.7
81936	78.1
81937	37.6
81955	101.7
81968	23.8
81969	21.7
81973	38.8
81980	33.5
MEAN	46.0
S.D.	29.95
S.E.	9.47
N	10

umol/L = micromoles/Liter

PCHEv4.05
12/10/2010

TABLE A83 (F0 FEMALES - POST-MATING DAY 25)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SPECIAL CHEMISTRY VALUES

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0 MG/KG FEMALES	
81932	18.9
81966	12.0
81971	15.4
MEAN	15.4
S.D.	3.45
S.E.	1.99
N	3

umol/L = micromoles/Liter

PCHEv4.05
12/10/2010
R:01/10/2011

TABLE A84 (F0 FEMALES - POST-COHABITATION DAY 25)

PROJECT NO.:WIL-402011F — ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID —

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL SPECIAL CHEMISTRY VALUES — PCD 25

ANIMAL	BILE ACIDS
	umol/L
GROUP: 300 MG/KG FEMALES	
81945	12.6
81947	26.6
MEAN	19.6
S.D.	9.90
S.E.	7.00
N	2

umol/L = micromoles/Liter

PCHEv4.05
12/10/2010
R:01/10/2011

TABLE A85 (F0 FEMALES - TOTAL LITTER LOSS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SPECIAL CHEMISTRY VALUES TLL

ANIMAL	BILE ACIDS
	umol/L
GROUP: 900 MG/KG FEMALES	
81951	25.9
MEAN	25.9
S.D.	0.00
S.E.	0.00
N	1

umol/L = micromoles/Liter

PCHEv4.05
12/10/2010
R:01/10/2011

GROUP 1: SHAM CONTROL

FEMALE NUMBER	FIRST MALE	DATE	SECOND MALE	DATE	DAYS PRE-COITUS	PREGNANCY STATUS
81924	81983	10/06/10			2	G
81940	81990	10/06/10			3	G
81944	82004	10/06/10			4	G
81952	82012	10/06/10			2	G
81963	82017	10/06/10			3	G

G = GRAVID

GROUP 2: 0 MG/KG

FEMALE NUMBER	FIRST MALE	DATE	SECOND MALE	DATE	DAYS PRE-COITUS	PREGNANCY STATUS
81920	81988	10/06/10			2	G
81932	81989	10/06/10			1	NG
81938	81991	10/06/10			2	G
81939	81996	10/06/10			1	G
81942	81997	10/06/10			1	G
81950	81998	10/06/10			1	G
81958	82014	10/06/10			1	G
81966	82020	10/06/10			1	NG
81967	82021	10/06/10			3	G
81971	82025	10/06/10			1	NG
81975	82038	10/06/10			2	G
81979	82041	10/06/10			1	G

G = GRAVID, NG = NONGRAVID

GROUP 3: 100 MG/KG

FEMALE NUMBER	FIRST MALE	DATE	SECOND MALE	DATE	DAYS PRE-COITUS	PREGNANCY STATUS
81915	81982	10/06/10			3	G
81916	81987	10/06/10			2	G
81917	81994	10/06/10			3	G
81921	82001	10/06/10			4	G
81926	82003	10/06/10			4	G
81930	82007	10/06/10			1	G
81941	82011	10/06/10			1	G
81960	82016	10/06/10			1	G
81961	82022	10/06/10			3	G
81962	82024	10/06/10			2	G
81972	82034	10/06/10			2	G
81978	82046	10/06/10			1	G

G = GRAVID

GROUP 4: 300 MG/KG

FEMALE NUMBER	FIRST MALE	DATE	SECOND MALE	DATE	DAYS PRE-COITUS	PREGNANCY STATUS
81914	81993	10/06/10			13	G
81931	81995	10/06/10			3	G
81934	82000	10/06/10			3	G
81943	82002	10/06/10			3	G
81945	82005	10/06/10			B	NG
81946	82013	10/06/10			3	G
81947	82015	10/06/10			B	NG
81957	82023	10/06/10			5	G
81959	82031	10/06/10			2	G
81974	82036	10/06/10			1	G
81976	82039	10/06/10			5	G
81977	82044	10/06/10			4	G

G = GRAVID, NG = NONGRAVID, B = NO EVIDENCE OF MATING

GROUP 5: 900 MG/KG

FEMALE NUMBER	FIRST MALE	DATE	SECOND MALE	DATE	DAYS PRE-COITUS	PREGNANCY STATUS
81918	82006	10/06/10			4	G
81919	82009	10/06/10			5	G
81927	82010	10/06/10			14	G
81936	82018	10/06/10			3	G
81937	82028	10/06/10			2	G
81951	82029	10/06/10			1	G
81955	82030	10/06/10			1	G
81964	82035	10/06/10			4	G
81968	82037	10/06/10			3	G
81969	82040	10/06/10			2	G
81973	82042	10/06/10			2	G
81980	82043	10/06/10			5	G

G = GRAVID

GROUP 6: 60 MG/KG CYC

FEMALE NUMBER	FIRST MALE	DATE	SECOND MALE	DATE	DAYS PRE-COITUS	PREGNANCY STATUS
81928	81985	10/06/10			1	G
81935	81992	10/06/10			2	G
81949	82008	10/06/10			3	G
81953	82026	10/06/10			2	G
81970	82033	10/06/10			2	G

G = GRAVID

TABLE A87 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL GESTATION LENGTHS [DAYS]

GROUP: 1		2		3		4		5		6	
ANIMAL	GESTATION LENGTH	ANIMAL	GESTATION LENGTH	ANIMAL	GESTATION LENGTH	ANIMAL	GESTATION LENGTH	ANIMAL	GESTATION LENGTH	ANIMAL	GESTATION LENGTH
81924	21.	81920	22.	81915	22.	81914	21.	81918	22.	81928	21.
81940	22.	81938	22.	81916	22.	81931	22.	81919	21.	81935	22.
81944	22.	81939	22.	81917	22.	81934	22.	81927	22.	81949	21.
81952	21.	81942	22.	81921	22.	81943	22.	81936	22.	81953	21.
81963	21.	81950	23.	81926	22.	81946	22.	81937	23.	81970	21.
		81958	22.	81930	21.	81957	22.	81951	23.		
		81967	21.	81941	22.	81959	22.	81955	22.		
		81975	21.	81960	22.	81974	23.	81964	22.		
		81979	22.	81961	22.	81976	22.	81968	22.		
				81962	22.	81977	22.	81969	22.		
				81972	22.			81973	22.		
				81978	22.			81980	22.		
MEAN	21.4		21.9		21.9		22.0		22.1		21.2
S.D.	0.55		0.60		0.29		0.47		0.51		0.45
S.E.	0.24		0.20		0.08		0.15		0.15		0.20
N	5		9		12		10		12		5

1- SHAM CONTROL 2- 0 MG/KG 3- 100 MG/KG 4- 300 MG/KG 5- 900 MG/KG 6- 60 MG/KG CYC

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81924	F	SHAM CONTROL	PARTURITION OBS	20	10/28/10	7:45	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	13:56	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:45	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:53	P	PUPS PRESENT IN NESTING BOX
				21	10/29/10	14:09	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/30/10	6:30	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81940	F	SHAM CONTROL	PARTURITION OBS	20	10/29/10	7:45	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	13:53	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:52	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:37	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:46	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	12:43	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	12:52	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81944	F	SHAM CONTROL	PARTURITION OBS	20	10/30/10	7:52	P	NO PRE-DELIVERY FINDINGS
				20	10/30/10	12:37	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	7:46	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	12:44	P	NO PRE-DELIVERY FINDINGS
				22	11/01/10	7:42	P	PUPS PRESENT IN NESTING BOX
				22	11/01/10	8:05	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81952	F	SHAM CONTROL	PARTURITION OBS	20	10/28/10	7:45	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	13:56	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:45	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:54	P	PUPS PRESENT IN NESTING BOX
				21	10/29/10	14:15	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81963	F	SHAM CONTROL	PARTURITION OBS	20	10/29/10	7:46	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	13:55	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:53	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:37	P	PUPS PRESENT IN NESTING BOX
				21	10/30/10	12:49	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/31/10	6:33	P	NO SIGNIFICANT FINDINGS DURING PARTURITION

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81920	F	0 MG/KG	PARTURITION OBS	20	10/28/10	7:47	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	13:56	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:47	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:57	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	7:54	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	12:38	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	12:52	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81932	F	0 MG/KG	PARTURITION OBS	20	10/27/10	7:58	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:52	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:47	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:56	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:47	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	13:58	P	NO PRE-DELIVERY FINDINGS
				23	10/30/10	7:54	P	NO PRE-DELIVERY FINDINGS
				23	10/30/10	12:38	P	NO PRE-DELIVERY FINDINGS
				24	10/31/10	7:46	P	NO PRE-DELIVERY FINDINGS
				24	10/31/10	12:44	P	NO PRE-DELIVERY FINDINGS
				25	11/01/10	7:43	P	NO PRE-DELIVERY FINDINGS
81938	F	0 MG/KG	PARTURITION OBS	20	10/28/10	7:47	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	13:56	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:47	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:58	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	7:54	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	8:05	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/30/10	13:22	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81939	F	0 MG/KG	PARTURITION OBS	20	10/27/10	7:59	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:52	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:47	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:57	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:47	P	PUPS PRESENT IN NESTING BOX

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81939	F	0 MG/KG	PARTURITION OBS	22	10/29/10	7:59	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81942	F	0 MG/KG	PARTURITION OBS	20	10/27/10	7:59	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:53	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:48	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:57	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:48	P	PUPS PRESENT IN NESTING BOX
				22	10/29/10	8:03	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81950	F	0 MG/KG	PARTURITION OBS	20	10/27/10	8:00	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:53	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:48	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:57	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:48	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	13:58	P	NO PRE-DELIVERY FINDINGS
				23	10/30/10	7:54	P	PUPS PRESENT IN NESTING BOX
				23	10/30/10	8:06	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81958	F	0 MG/KG	PARTURITION OBS	20	10/27/10	8:00	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:53	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:48	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:58	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:48	P	PUPS PRESENT IN NESTING BOX
				22	10/29/10	8:08	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81966	F	0 MG/KG	PARTURITION OBS	20	10/27/10	8:00	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:53	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:48	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:58	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:48	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	13:59	P	NO PRE-DELIVERY FINDINGS
				23	10/30/10	7:55	P	NO PRE-DELIVERY FINDINGS
				23	10/30/10	12:39	P	NO PRE-DELIVERY FINDINGS
				24	10/31/10	7:46	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81966	F	0 MG/KG	PARTURITION OBS	24	10/31/10	12:44	P	NO PRE-DELIVERY FINDINGS
				25	11/01/10	7:44	P	NO PRE-DELIVERY FINDINGS
81967	F	0 MG/KG	PARTURITION OBS	20	10/29/10	7:48	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	13:59	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:55	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:40	P	PUPS PRESENT IN NESTING BOX
				21	10/30/10	12:55	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/31/10	6:37	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81971	F	0 MG/KG	PARTURITION OBS	20	10/27/10	8:00	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:53	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:48	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:58	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:49	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	13:59	P	NO PRE-DELIVERY FINDINGS
				23	10/30/10	7:55	P	NO PRE-DELIVERY FINDINGS
				23	10/30/10	12:40	P	NO PRE-DELIVERY FINDINGS
				24	10/31/10	7:46	P	NO PRE-DELIVERY FINDINGS
				24	10/31/10	12:45	P	NO PRE-DELIVERY FINDINGS
				25	11/01/10	7:45	P	NO PRE-DELIVERY FINDINGS
81975	F	0 MG/KG	PARTURITION OBS	20	10/28/10	7:49	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	13:59	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:49	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:59	P	PUPS PRESENT IN NESTING BOX
				21	10/29/10	14:19	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/30/10	6:33	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81979	F	0 MG/KG	PARTURITION OBS	20	10/27/10	8:01	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:54	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:49	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:59	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:49	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81979	F	0 MG/KG	PARTURITION OBS	22	10/29/10	13:59	P	PUPS PRESENT IN NESTING BOX
				22	10/29/10	14:26	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81915	F	100 MG/KG	PARTURITION OBS	20	10/29/10	7:50	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	14:00	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:55	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:41	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:47	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	12:45	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	12:54	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81916	F	100 MG/KG	PARTURITION OBS	20	10/28/10	7:49	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	13:59	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:50	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	14:00	P	VAGINAL DISCHARGE/MATERIAL
				22	10/30/10	7:55	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	8:11	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81917	F	100 MG/KG	PARTURITION OBS	20	10/29/10	7:50	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	14:00	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:56	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:41	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:47	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	12:45	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	12:57	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81921	F	100 MG/KG	PARTURITION OBS	20	10/30/10	7:56	P	NO PRE-DELIVERY FINDINGS
				20	10/30/10	12:42	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	7:47	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	12:45	P	NO PRE-DELIVERY FINDINGS
				22	11/01/10	7:45	P	PUPS PRESENT IN NESTING BOX
				22	11/01/10	8:12	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81926	F	100 MG/KG	PARTURITION OBS	20	10/30/10	7:56	P	NO PRE-DELIVERY FINDINGS
				20	10/30/10	12:42	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81926	F	100 MG/KG	PARTURITION OBS	21	10/31/10	7:48	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	12:46	P	NO PRE-DELIVERY FINDINGS
				22	11/01/10	7:46	P	PUPS PRESENT IN NESTING BOX
				22	11/01/10	8:15	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81930	F	100 MG/KG	PARTURITION OBS	20	10/27/10	8:01	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:54	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:49	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	13:59	P	PUPS PRESENT IN NESTING BOX
				21	10/28/10	14:09	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81941	F	100 MG/KG	PARTURITION OBS	20	10/27/10	8:01	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:54	P	VAGINAL DISCHARGE/MATERIAL
				21	10/28/10	7:50	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	14:00	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:50	P	PUPS PRESENT IN NESTING BOX
				22	10/29/10	8:10	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81960	F	100 MG/KG	PARTURITION OBS	20	10/27/10	8:02	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:55	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:50	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	14:00	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:50	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	14:01	P	PUPS PRESENT IN NESTING BOX
				22	10/29/10	14:35	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81961	F	100 MG/KG	PARTURITION OBS	20	10/29/10	7:51	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	14:01	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:56	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:42	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:48	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	7:54	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81962	F	100 MG/KG	PARTURITION OBS	20	10/28/10	7:50	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:00	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81962	F	100 MG/KG	PARTURITION OBS	21	10/29/10	7:51	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	14:01	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	7:57	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	8:14	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81972	F	100 MG/KG	PARTURITION OBS	20	10/28/10	7:50	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:00	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:51	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	14:01	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	7:57	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	8:19	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81978	F	100 MG/KG	PARTURITION OBS	20	10/27/10	8:02	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:55	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:50	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	14:00	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:51	P	PUPS PRESENT IN NESTING BOX
				22	10/29/10	8:16	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81914	F	300 MG/KG	PARTURITION OBS	20	11/08/10	7:42	P	NO PRE-DELIVERY FINDINGS
				20	11/08/10	13:51	P	NO PRE-DELIVERY FINDINGS
				21	11/09/10	7:20	P	PUPS PRESENT IN NESTING BOX
				21	11/09/10	7:21	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				21	11/09/10	9:15	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81931	F	300 MG/KG	PARTURITION OBS	20	10/29/10	7:51	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	14:01	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:57	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:43	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:48	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	7:58	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81934	F	300 MG/KG	PARTURITION OBS	20	10/29/10	7:51	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	14:02	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:57	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81934	F	300 MG/KG	PARTURITION OBS	21	10/30/10	12:43	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:48	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	8:14	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81943	F	300 MG/KG	PARTURITION OBS	20	10/29/10	7:52	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	14:02	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:57	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:43	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:49	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	8:17	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/31/10	12:35	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81945	F	300 MG/KG	PARTURITION OBS	-	10/27/10	8:03	P	NO PRE-DELIVERY FINDINGS
				-	10/27/10	13:55	P	NO PRE-DELIVERY FINDINGS
				-	10/28/10	7:51	P	NO PRE-DELIVERY FINDINGS
				-	10/28/10	14:01	P	NO PRE-DELIVERY FINDINGS
				-	10/29/10	7:52	P	NO PRE-DELIVERY FINDINGS
				-	10/29/10	14:02	P	NO PRE-DELIVERY FINDINGS
				-	10/30/10	7:58	P	NO PRE-DELIVERY FINDINGS
				-	10/30/10	12:43	P	NO PRE-DELIVERY FINDINGS
				-	10/31/10	7:49	P	NO PRE-DELIVERY FINDINGS
				-	10/31/10	12:46	P	NO PRE-DELIVERY FINDINGS
				-	11/01/10	7:46	P	NO PRE-DELIVERY FINDINGS
				-	11/01/10	14:08	P	NO PRE-DELIVERY FINDINGS
				-	11/02/10	7:46	P	NO PRE-DELIVERY FINDINGS
				-	11/02/10	13:42	P	NO PRE-DELIVERY FINDINGS
				-	11/03/10	8:11	P	NO PRE-DELIVERY FINDINGS
				-	11/03/10	14:06	P	NO PRE-DELIVERY FINDINGS
				-	11/04/10	8:05	P	NO PRE-DELIVERY FINDINGS
				-	11/04/10	13:41	P	NO PRE-DELIVERY FINDINGS
				-	11/05/10	7:54	P	NO PRE-DELIVERY FINDINGS
				-	11/05/10	14:24	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS	
81945	F	300 MG/KG	PARTURITION OBS	-	11/06/10	6:55	P	NO PRE-DELIVERY FINDINGS	
				-	11/08/10	7:42	P	NO PRE-DELIVERY FINDINGS	
				-	11/08/10	13:51	P	NO PRE-DELIVERY FINDINGS	
				-	11/09/10	7:20	P	NO PRE-DELIVERY FINDINGS	
				-	11/09/10	14:27	P	NO PRE-DELIVERY FINDINGS	
				-	11/10/10	8:05	P	NO PRE-DELIVERY FINDINGS	
				-	11/10/10	14:07	P	NO PRE-DELIVERY FINDINGS	
				-	11/11/10	7:14	P	NO PRE-DELIVERY FINDINGS	
				-	11/11/10	15:06	P	NO PRE-DELIVERY FINDINGS	
				-	11/12/10	7:12	P	NO PRE-DELIVERY FINDINGS	
				-	11/12/10	14:18	P	NO PRE-DELIVERY FINDINGS	
				-	11/13/10	8:53	P	NO PRE-DELIVERY FINDINGS	
				-	11/13/10	14:12	P	NO PRE-DELIVERY FINDINGS	
				-	11/14/10	6:31	P	NO PRE-DELIVERY FINDINGS	
				-	11/06/10	12:32	P	NO PRE-DELIVERY FINDINGS	*
				-	11/07/10	7:05	P	NO PRE-DELIVERY FINDINGS	*
				-	11/07/10	12:14	P	NO PRE-DELIVERY FINDINGS	*
81946	F	300 MG/KG	PARTURITION OBS	20	10/29/10	7:52	P	NO PRE-DELIVERY FINDINGS	
				20	10/29/10	14:02	P	NO PRE-DELIVERY FINDINGS	
				21	10/30/10	7:58	P	NO PRE-DELIVERY FINDINGS	
				21	10/30/10	12:43	P	NO PRE-DELIVERY FINDINGS	
				22	10/31/10	7:49	P	PUPS PRESENT IN NESTING BOX	
				22	10/31/10	8:19	P	NO SIGNIFICANT FINDINGS DURING PARTURITION	
				22	10/31/10	12:36	P	NO SIGNIFICANT FINDINGS DURING PARTURITION	
81947	F	300 MG/KG	PARTURITION OBS	-	10/27/10	8:03	P	NO PRE-DELIVERY FINDINGS	
				-	10/27/10	13:55	P	NO PRE-DELIVERY FINDINGS	
				-	10/28/10	7:51	P	NO PRE-DELIVERY FINDINGS	
				-	10/28/10	14:01	P	NO PRE-DELIVERY FINDINGS	
				-	10/29/10	7:52	P	NO PRE-DELIVERY FINDINGS	
				-	10/29/10	14:03	P	NO PRE-DELIVERY FINDINGS	

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY
* - LATE COMPUTER ENTRY OBSERVATIONS FOR ABOVE DATES

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS	
81947	F	300 MG/KG	PARTURITION OBS	-	10/30/10	7:58	P	NO PRE-DELIVERY FINDINGS	
				-	10/30/10	12:43	P	NO PRE-DELIVERY FINDINGS	
				-	10/31/10	7:49	P	NO PRE-DELIVERY FINDINGS	
				-	10/31/10	12:46	P	NO PRE-DELIVERY FINDINGS	
				-	11/01/10	7:46	P	NO PRE-DELIVERY FINDINGS	
				-	11/01/10	14:08	P	NO PRE-DELIVERY FINDINGS	
				-	11/02/10	7:47	P	NO PRE-DELIVERY FINDINGS	
				-	11/02/10	13:43	P	NO PRE-DELIVERY FINDINGS	
				-	11/03/10	8:12	P	NO PRE-DELIVERY FINDINGS	
				-	11/03/10	14:06	P	NO PRE-DELIVERY FINDINGS	
				-	11/04/10	8:05	P	NO PRE-DELIVERY FINDINGS	
				-	11/04/10	13:42	P	NO PRE-DELIVERY FINDINGS	
				-	11/05/10	7:54	P	NO PRE-DELIVERY FINDINGS	
				-	11/05/10	14:24	P	NO PRE-DELIVERY FINDINGS	
				-	11/06/10	6:55	P	NO PRE-DELIVERY FINDINGS	
				-	11/08/10	7:42	P	NO PRE-DELIVERY FINDINGS	
				-	11/08/10	13:52	P	NO PRE-DELIVERY FINDINGS	
				-	11/09/10	7:20	P	NO PRE-DELIVERY FINDINGS	
				-	11/09/10	14:28	P	NO PRE-DELIVERY FINDINGS	
				-	11/10/10	8:05	P	NO PRE-DELIVERY FINDINGS	
				-	11/10/10	14:07	P	NO PRE-DELIVERY FINDINGS	
				-	11/11/10	7:14	P	NO PRE-DELIVERY FINDINGS	
				-	11/11/10	15:06	P	NO PRE-DELIVERY FINDINGS	
				-	11/12/10	7:12	P	NO PRE-DELIVERY FINDINGS	
				-	11/12/10	14:19	P	NO PRE-DELIVERY FINDINGS	
				-	11/13/10	8:53	P	NO PRE-DELIVERY FINDINGS	
				-	11/13/10	14:13	P	NO PRE-DELIVERY FINDINGS	
				-	11/14/10	6:31	P	NO PRE-DELIVERY FINDINGS	
				-	11/06/10	12:32	P	NO PRE-DELIVERY FINDINGS	*
				-	11/07/10	7:05	P	NO PRE-DELIVERY FINDINGS	*

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY
* - LATE COMPUTER ENTRY OBSERVATIONS FOR ABOVE DATES

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 11

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS	
81947	F	300 MG/KG	PARTURITION OBS	-	11/07/10	12:14	P	NO PRE-DELIVERY FINDINGS	*
81957	F	300 MG/KG	PARTURITION OBS	20	10/31/10	7:50	P	NO PRE-DELIVERY FINDINGS	
				20	10/31/10	12:47	P	NO PRE-DELIVERY FINDINGS	
				21	11/01/10	7:46	P	NO PRE-DELIVERY FINDINGS	
				21	11/01/10	14:08	P	NO PRE-DELIVERY FINDINGS	
				22	11/02/10	7:47	P	NO PRE-DELIVERY FINDINGS	
				22	11/02/10	13:43	P	PUPS PRESENT IN NESTING BOX	
				22	11/02/10	13:45	P	NO SIGNIFICANT FINDINGS DURING PARTURITION	
81959	F	300 MG/KG	PARTURITION OBS	20	10/28/10	7:51	P	NO PRE-DELIVERY FINDINGS	
				20	10/28/10	14:01	P	NO PRE-DELIVERY FINDINGS	
				21	10/29/10	7:52	P	NO PRE-DELIVERY FINDINGS	
				21	10/29/10	14:03	P	NO PRE-DELIVERY FINDINGS	
				22	10/30/10	7:58	P	PUPS PRESENT IN NESTING BOX	
				22	10/30/10	8:48	P	NO SIGNIFICANT FINDINGS DURING PARTURITION	
81974	F	300 MG/KG	PARTURITION OBS	20	10/27/10	8:03	P	NO PRE-DELIVERY FINDINGS	
				20	10/27/10	13:56	P	NO PRE-DELIVERY FINDINGS	
				21	10/28/10	7:51	P	NO PRE-DELIVERY FINDINGS	
				21	10/28/10	14:01	P	NO PRE-DELIVERY FINDINGS	
				22	10/29/10	7:53	P	NO PRE-DELIVERY FINDINGS	
				22	10/29/10	14:04	P	VAGINAL DISCHARGE/MATERIAL	
				23	10/30/10	7:58	P	PUPS PRESENT IN NESTING BOX	
				23	10/30/10	8:24	P	NO SIGNIFICANT FINDINGS DURING PARTURITION	
81976	F	300 MG/KG	PARTURITION OBS	20	10/31/10	7:50	P	NO PRE-DELIVERY FINDINGS	
				20	10/31/10	12:47	P	NO PRE-DELIVERY FINDINGS	
				21	11/01/10	7:46	P	NO PRE-DELIVERY FINDINGS	
				21	11/01/10	14:09	P	NO PRE-DELIVERY FINDINGS	
				22	11/02/10	7:47	P	PUPS PRESENT IN NESTING BOX	
				22	11/02/10	7:48	P	NO SIGNIFICANT FINDINGS DURING PARTURITION	
81977	F	300 MG/KG	PARTURITION OBS	20	10/30/10	7:59	P	NO PRE-DELIVERY FINDINGS	
				20	10/30/10	12:44	P	NO PRE-DELIVERY FINDINGS	

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

* - LATE COMPUTER ENTRY OBSERVATIONS FOR ABOVE DATES

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81977	F	300 MG/KG	PARTURITION OBS	21	10/31/10	7:50	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	12:47	P	NO PRE-DELIVERY FINDINGS
				22	11/01/10	7:46	P	PUPS PRESENT IN NESTING BOX
				22	11/01/10	8:16	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81918	F	900 MG/KG	PARTURITION OBS	20	10/30/10	7:59	P	NO PRE-DELIVERY FINDINGS
				20	10/30/10	12:44	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	7:50	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	12:47	P	NO PRE-DELIVERY FINDINGS
				22	11/01/10	7:47	P	PUPS PRESENT IN NESTING BOX
				22	11/01/10	8:24	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81919	F	900 MG/KG	PARTURITION OBS	20	10/31/10	7:50	P	NO PRE-DELIVERY FINDINGS
				20	10/31/10	12:48	P	NO PRE-DELIVERY FINDINGS
				21	11/01/10	7:47	P	NO PRE-DELIVERY FINDINGS
				21	11/01/10	14:09	P	PUPS PRESENT IN NESTING BOX
				21	11/01/10	14:10	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	11/02/10	7:18	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81927	F	900 MG/KG	PARTURITION OBS	20	11/09/10	7:20	P	NO PRE-DELIVERY FINDINGS
				20	11/09/10	14:28	P	VAGINAL DISCHARGE/MATERIAL
				21	11/10/10	8:05	P	VAGINAL DISCHARGE/MATERIAL
				21	11/10/10	14:08	P	VAGINAL DISCHARGE/MATERIAL
				22	11/11/10	7:14	P	PUPS PRESENT IN NESTING BOX
				22	11/11/10	7:15	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81936	F	900 MG/KG	PARTURITION OBS	20	10/29/10	7:53	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	14:04	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	8:00	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:44	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:51	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	8:21	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81937	F	900 MG/KG	PARTURITION OBS	20	10/28/10	7:52	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:01	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A88 (F0 FEMALES)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DAM OBSERVATIONS DURING PARTURITION

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81937	F	900 MG/KG	PARTURITION OBS	21	10/29/10	7:53	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	14:04	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	8:00	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	12:44	P	NO PRE-DELIVERY FINDINGS
				23	10/31/10	7:51	P	PUPS PRESENT IN NESTING BOX
				23	10/31/10	8:24	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				23	10/31/10	12:39	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81951	F	900 MG/KG	PARTURITION OBS	20	10/27/10	8:04	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:56	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:52	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	14:01	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:54	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	14:04	P	VAGINAL DISCHARGE/MATERIAL
				23	10/30/10	8:00	P	PUPS PRESENT IN NESTING BOX
				23	10/30/10	8:38	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81955	F	900 MG/KG	PARTURITION OBS	20	10/27/10	8:04	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:56	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:52	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	14:02	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	7:54	P	NO PRE-DELIVERY FINDINGS
				22	10/29/10	14:05	P	PUPS PRESENT IN NESTING BOX
				22	10/29/10	14:37	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81964	F	900 MG/KG	PARTURITION OBS	20	10/30/10	8:00	P	NO PRE-DELIVERY FINDINGS
				20	10/30/10	12:45	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	7:51	P	NO PRE-DELIVERY FINDINGS
				21	10/31/10	12:48	P	NO PRE-DELIVERY FINDINGS
				22	11/01/10	7:47	P	VAGINAL DISCHARGE/MATERIAL
				22	11/01/10	14:09	P	PUPS PRESENT IN NESTING BOX
				22	11/01/10	14:15	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81968	F	900 MG/KG	PARTURITION OBS	20	10/29/10	7:54	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81968	F	900 MG/KG	PARTURITION OBS	20	10/29/10	14:05	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	8:01	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:45	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	7:52	P	NO PRE-DELIVERY FINDINGS
				22	10/31/10	12:48	P	PUPS PRESENT IN NESTING BOX
				22	10/31/10	13:06	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81969	F	900 MG/KG	PARTURITION OBS	20	10/28/10	7:52	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:02	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:54	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	14:05	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	8:01	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	12:45	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	12:57	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81973	F	900 MG/KG	PARTURITION OBS	20	10/28/10	7:52	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:02	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:55	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	14:05	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	8:01	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	8:50	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81980	F	900 MG/KG	PARTURITION OBS	20	10/31/10	7:52	P	NO PRE-DELIVERY FINDINGS
				20	10/31/10	12:48	P	NO PRE-DELIVERY FINDINGS
				21	11/01/10	7:47	P	NO PRE-DELIVERY FINDINGS
				21	11/01/10	14:10	P	NO PRE-DELIVERY FINDINGS
				22	11/02/10	7:47	P	NO PRE-DELIVERY FINDINGS
				22	11/02/10	13:43	P	PUPS PRESENT IN NESTING BOX
				22	11/02/10	13:50	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				23	11/03/10	6:47	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81928	F	60 MG/KG CYC	PARTURITION OBS	20	10/27/10	8:04	P	NO PRE-DELIVERY FINDINGS
				20	10/27/10	13:52	P	NO PRE-DELIVERY FINDINGS
				21	10/28/10	7:46	P	NO PRE-DELIVERY FINDINGS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

ANIMAL	SEX	GROUP	CATEGORY	GD	DATE	TIME	GRADE	OBSERVATIONS
81928	F	60 MG/KG CYC	PARTURITION OBS	21	10/28/10	14:03	P	PUPS PRESENT IN NESTING BOX
				21	10/28/10	14:06	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/29/10	7:20	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81935	F	60 MG/KG CYC	PARTURITION OBS	20	10/28/10	7:46	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:03	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:46	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:55	P	NO PRE-DELIVERY FINDINGS
				22	10/30/10	7:53	P	PUPS PRESENT IN NESTING BOX
				22	10/30/10	8:56	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81949	F	60 MG/KG CYC	PARTURITION OBS	20	10/29/10	7:46	P	NO PRE-DELIVERY FINDINGS
				20	10/29/10	13:55	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	7:53	P	NO PRE-DELIVERY FINDINGS
				21	10/30/10	12:37	P	PUPS PRESENT IN NESTING BOX
				21	10/30/10	13:19	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81953	F	60 MG/KG CYC	PARTURITION OBS	20	10/28/10	7:46	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:04	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:46	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:56	P	PUPS PRESENT IN NESTING BOX
				21	10/29/10	14:42	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
81970	F	60 MG/KG CYC	PARTURITION OBS	20	10/28/10	7:47	P	NO PRE-DELIVERY FINDINGS
				20	10/28/10	14:04	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	7:46	P	NO PRE-DELIVERY FINDINGS
				21	10/29/10	13:56	P	PUPS PRESENT IN NESTING BOX
				21	10/29/10	14:45	P	NO SIGNIFICANT FINDINGS DURING PARTURITION
				22	10/30/10	6:37	P	NO SIGNIFICANT FINDINGS DURING PARTURITION

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT GD = GESTATIONAL DAY

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81983 GROUP 1: SHAM CONTROL MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.12	0.454
LIVER	14.99	3.210
KIDNEYS	3.87	0.829
SPLEEN	0.72	0.154
HEART	1.49	0.319
LUNGS	1.65	0.353
TESTIS, RT	1.64	0.351
TESTIS, LT	1.66	0.355
EPIDIDYMIS, RT	0.55	0.118
EPIDIDYMIS, LT	0.61	0.131
THYMUS	0.3302	0.071
ADRENAL GLANDS	0.0656	0.014
THYROIDS/PARATHY	0.0180	0.004
FINAL BODY WT(G)	467.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81990 GROUP 1: SHAM CONTROL MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.428
LIVER	15.74	3.321
KIDNEYS	3.26	0.688
SPLEEN	0.77	0.162
HEART	1.37	0.289
LUNGS	1.56	0.329
TESTIS, RT	1.62	0.342
TESTIS, LT	1.59	0.335
EPIDIDYMIS, RT	0.62	0.131
EPIDIDYMIS, LT	0.61	0.129
THYMUS	0.3045	0.064
ADRENAL GLANDS	0.0502	0.011
THYROIDS/PARATHY	0.0181	0.004
FINAL BODY WT(G)	474.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 82004 GROUP 1: SHAM CONTROL MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.25	0.479
LIVER	16.26	3.460
KIDNEYS	3.65	0.777
SPLEEN	0.95	0.202
HEART	1.47	0.313
LUNGS	1.80	0.383
TESTIS, RT	1.81	0.385
TESTIS, LT	1.73	0.368
EPIDIDYMIS, RT	0.63	0.134
EPIDIDYMIS, LT	0.70	0.149
THYMUS	0.5263	0.112
ADRENAL GLANDS	0.0597	0.013
THYROIDS/PARATHY	0.0220	0.005
FINAL BODY WT(G)	470.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 82012 GROUP 1: SHAM CONTROL MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.408
LIVER	17.44	3.502
KIDNEYS	3.32	0.667
SPLEEN	0.81	0.163
HEART	1.61	0.323
LUNGS	1.55	0.311
TESTIS, RT	1.68	0.337
TESTIS, LT	1.60	0.321
EPIDIDYMIS, RT	0.62	0.124
EPIDIDYMIS, LT	0.59	0.118
THYMUS	0.3183	0.064
ADRENAL GLANDS	0.0647	0.013
THYROIDS/PARATHY	0.0178	0.004
FINAL BODY WT(G)	498.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

ANIMAL NO. 82017 GROUP 1: SHAM CONTROL MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.446
LIVER	13.61	3.210
KIDNEYS	3.45	0.814
SPLEEN	0.66	0.156
HEART	1.40	0.330
LUNGS	1.45	0.342
TESTIS, RT	1.63	0.384
TESTIS, LT	0.79	0.186
EPIDIDYMIS, RT	0.66	0.156
EPIDIDYMIS, LT	0.34	0.080
THYMUS	0.3174	0.075
ADRENAL GLANDS	0.0441	0.010
THYROIDS/PARATHY	0.0190	0.004
FINAL BODY WT(G)	424.	

		GRADE
EPIDIDYMIDES	GROSS: SMALL LEFT	P
TESTES	GROSS: UNDESCENDED LEFT	P
TESTES	GROSS: SMALL LEFT	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
PANCREAS	PITUITARY	PROSTATE	RECTUM
SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
SKIN	SPLEEN	SEMINAL VESICLES	THYROID GLANDS
THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY
COAGULATING GL			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81988 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.10	0.479
LIVER	11.61	2.651
KIDNEYS	3.04	0.694
SPLEEN	0.59	0.135
HEART	1.29	0.295
LUNGS	1.43	0.326
TESTIS, RT	1.53	0.349
TESTIS, LT	1.53	0.349
EPIDIDYMIS, RT	0.56	0.128
EPIDIDYMIS, LT	0.53	0.121
THYMUS	0.4307	0.098
ADRENAL GLANDS	0.0454	0.010
THYROIDS/PARATHY	0.0189	0.004
FINAL BODY WT(G)	438.	

KIDNEYS
LN, MANDIBULAR
LIVER
PROSTATE
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
MICRO:	NEPHROPATHY, CHRONIC PROGRESSIVE				1
MICRO:	PLASMACYTOSIS, MEDULLARY				1
MICRO:	INFILTRATE, MONONUCLEAR				1
MICRO:	INFILTRATE, LYMPHOCYTE				1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
	TESTES	THYROID GLANDS	THYMUS	TRACHEA	
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE	
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN	
	CECUM	COLON	DUODENUM	EPIDIDYMIDES	
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
	ILEUM	JEJUNUM	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	RECTUM	
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
	TESTES	THYROID GLANDS	THYMUS	TRACHEA	
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL		

NOT PRESENT FOR EXAMINATION

MICRO:PARATHYROIDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81989 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.534
LIVER	10.50	2.734
KIDNEYS	2.94	0.766
SPLEEN	0.71	0.185
HEART	1.30	0.339
LUNGS	1.49	0.388
TESTIS, RT	1.52	0.396
TESTIS, LT	1.52	0.396
EPIDIDYMIS, RT	0.60	0.156
EPIDIDYMIS, LT	0.63	0.164
THYMUS	0.1814	0.047
ADRENAL GLANDS	0.0469	0.012
THYROIDS/PARATHY	0.0180	0.005
FINAL BODY WT(G)	384.	

KIDNEYS
LN, MANDIBULAR
LIVER
PANCREAS
NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	NEPHROPATHY, CHRONIC PROGRESSIVE	1
MICRO:	PLASMACYTOSIS, MEDULLARY	1
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	INFILTRATE, LYMPHOCYTE	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	PARATHYROIDS	THYMUS
	TRACHEA	URINARY BLADDER	LN, AXILLARY	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81991 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.99	0.412
LIVER	15.21	3.149
KIDNEYS	3.22	0.667
SPLEEN	0.73	0.151
HEART	1.46	0.302
LUNGS	1.56	0.323
TESTIS, RT	1.64	0.340
TESTIS, LT	1.58	0.327
EPIDIDYMIS, RT	0.60	0.124
EPIDIDYMIS, LT	0.58	0.120
THYMUS	0.2833	0.059
ADRENAL GLANDS	0.0620	0.013
THYROIDS/PARATHY	0.0175	0.004
FINAL BODY WT(G)	483.	

NERVES, OPTIC
LIVER
SKELETAL MUSCLE
THYROID GLANDS
PARATHYROIDS
NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
MICRO:	INFILTRATE, MONONUCLEAR	1
	VACUOLATION, HEPATOCELLULAR, PERIPORTAL	1
MICRO:	INFILTRATE, MONONUCLEAR	(1)
MICRO:	CYST, ULTIMOBRANCHIAL	P
MICRO:	NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	PANCREAS
	PITUITARY	PROSTATE	RECTUM	SPINAL CORD
	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	PARATHYROIDS
	THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY
	COAGULATING GL			

ANIMAL NO. 81991 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
( )-FOCAL/SOLITARY, (( ))-MULTIFOCAL/MULTIPLE, NO PARENTHESES-NOT SPECIFIED

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81996 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.09	0.543
LIVER	12.41	3.223
KIDNEYS	2.85	0.740
SPLEEN	0.56	0.145
HEART	1.19	0.309
LUNGS	1.21	0.314
TESTIS, RT	1.53	0.397
TESTIS, LT	1.56	0.405
EPIDIDYMIS, RT	0.57	0.148
EPIDIDYMIS, LT	0.54	0.140
THYMUS	0.3029	0.079
ADRENAL GLANDS	0.0641	0.017
THYROIDS/PARATHY	0.0180	0.005
FINAL BODY WT(G)	385.	

KIDNEYS: NO SIGNIFICANT CHANGES OBSERVED

GRADE

MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE 1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	PANCREAS
	PITUITARY	PROSTATE	RECTUM	SPINAL CORD
	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	PARATHYROIDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81997 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.446
LIVER	15.02	3.301
KIDNEYS	3.60	0.791
SPLEEN	0.60	0.132
HEART	1.48	0.325
LUNGS	1.54	0.338
TESTIS, RT	1.79	0.393
TESTIS, LT	1.78	0.391
EPIDIDYMIS, RT	0.59	0.130
EPIDIDYMIS, LT	0.61	0.134
THYMUS	0.3309	0.073
ADRENAL GLANDS	0.0536	0.012
THYROIDS/PARATHY	0.0188	0.004
FINAL BODY WT(G)	455.	

HEART
LIVER
NO SIGNIFICANT
CHANGES OBSERVED

NOT PRESENT FOR EXAMINATION

		GRADE
MICRO:	CARDIOMYOPATHY	2
MICRO:	INFILTRATE, MONONUCLEAR	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	ILEUM
	JEJUNUM	KIDNEYS	LN, MANDIBULAR	LN, MESENTERIC
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	THYROID GLANDS
	THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY
	COAGULATING GL			

MICRO:PARATHYROIDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81998 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.01	0.421
LIVER	13.77	2.887
KIDNEYS	3.23	0.677
SPLEEN	0.82	0.172
HEART	1.81	0.379
LUNGS	1.98	0.415
TESTIS, RT	1.67	0.350
TESTIS, LT	1.65	0.346
EPIDIDYMIS, RT	0.63	0.132
EPIDIDYMIS, LT	0.64	0.134
THYMUS	0.4070	0.085
ADRENAL GLANDS	0.0538	0.011
THYROIDS/PARATHY	0.0219	0.005
FINAL BODY WT(G)	477.	

EYES
KIDNEYS
LN, MANDIBULAR
PROSTATE
PARATHYROIDS
NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFILTRATE, NEUTROPHIL EXTRAOCULAR TISSUES	1
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	PLASMACYTOSIS, MEDULLARY	1
MICRO:	INFILTRATE, LYMPHOCYTE	1
MICRO:	NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	PARATHYROIDS	THYMUS
	TRACHEA	URINARY BLADDER	LN, AXILLARY	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82014 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.17	0.391
LIVER	17.87	3.220
KIDNEYS	3.29	0.593
SPLEEN	0.64	0.115
HEART	1.90	0.342
LUNGS	1.76	0.317
TESTIS, RT	1.70	0.306
TESTIS, LT	1.67	0.301
EPIDIDYMIS, RT	0.57	0.103
EPIDIDYMIS, LT	0.55	0.099
THYMUS	0.1880	0.034
ADRENAL GLANDS	0.0551	0.010
THYROIDS/PARATHY	0.0194	0.003
FINAL BODY WT(G)	555.	

HEART
LN, MANDIBULAR
LIVER
^==>
LIVER

PARATHYROIDS

NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	CARDIOMYOPATHY	1
MICRO:	PLASMACYTOSIS, MEDULLARY	1
GROSS:	SWOLLEN	P
	MEDIAN LOBE	
LIVER:	VACUOLATION, HEPATOCELLULAR, PERIPORTAL	
MICRO:	VACUOLATION, HEPATOCELLULAR, PERIPORTAL	2
	INFILTRATE, MONONUCLEAR	1
MICRO:	NO SIGNIFICANT CHANGES OBSERVED	
	ONE OF PAIR PRESENT	

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	ILEUM
	JEJUNUM	KIDNEYS	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
	STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN
	SEMINAL VESICLES	TESTES	THYROID GLANDS	PARATHYROIDS
	THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY
	COAGULATING GL			

ANIMAL NO. 82014 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82020 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.06	0.459
LIVER	13.39	2.982
KIDNEYS	3.37	0.751
SPLEEN	0.56	0.125
HEART	1.54	0.343
LUNGS	1.50	0.334
TESTIS, RT	2.05	0.457
TESTIS, LT	2.12	0.472
EPIDIDYMIS, RT	0.73	0.163
EPIDIDYMIS, LT	0.71	0.158
THYMUS	0.2673	0.060
ADRENAL GLANDS	0.0681	0.015
THYROIDS/PARATHY	0.0179	0.004
FINAL BODY WT(G)	449.	

EYES
LIVER
PITUITARY
NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO: INFILTRATE, NEUTROPHIL				1
EXTRAOCULAR TISSUES				
MICRO: INFILTRATE, MONONUCLEAR				1
MICRO: NO SIGNIFICANT CHANGES OBSERVED				
PARS NERVOSA NOT IN SECTION				

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	KIDNEYS	LN, MANDIBULAR	LN, MESENTERIC
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	THYROID GLANDS
	PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82021 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.99	0.451
LIVER	11.43	2.592
KIDNEYS	3.36	0.762
SPLEEN	0.58	0.132
HEART	1.35	0.306
LUNGS	1.44	0.327
TESTIS, RT	1.60	0.363
TESTIS, LT	1.62	0.367
EPIDIDYMIS, RT	0.59	0.134
EPIDIDYMIS, LT	0.57	0.129
THYMUS	0.5348	0.121
ADRENAL GLANDS	0.0502	0.011
THYROIDS/PARATHY	0.0181	0.004
FINAL BODY WT(G)	441.	

EYES

KIDNEYS

LN, MANDIBULAR

^==> GROSS UNCONFIRMED

LIVER

NO SIGNIFICANT CHANGES OBSERVED

					GRADE
MICRO: INFILTRATE, NEUTROPHIL EXTRAOCULAR TISSUES					1
MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE					1
GROSS: DISCOLORATION, DARK RED BILATERAL					P
MICRO: INFILTRATE, MONONUCLEAR					1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	
	PANCREAS	PITUITARY	PROSTATE	RECTUM	
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	LN, AXILLARY	COAGULATING GL			
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE	
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN	
	CECUM	COLON	DUODENUM	EPIDIDYMIDES	
	ESOPHAGUS	NERVES, OPTIC	HEART	ILEUM	
	JEJUNUM	LN, MANDIBULAR	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	
	STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN	
	SEMINAL VESICLES	TESTES	THYROID GLANDS	PARATHYROIDS	
	THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY	
	COAGULATING GL				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82025 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.449
LIVER	13.04	2.853
KIDNEYS	3.11	0.681
SPLEEN	0.57	0.125
HEART	1.40	0.306
LUNGS	1.44	0.315
TESTIS, RT	1.75	0.383
TESTIS, LT	1.73	0.379
EPIDIDYMIS, RT	0.69	0.151
EPIDIDYMIS, LT	0.62	0.136
THYMUS	0.3203	0.070
ADRENAL GLANDS	0.0526	0.012
THYROIDS/PARATHY	0.0178	0.004
FINAL BODY WT(G)	457.	

EPIDIDYMIDES
HEART
LN, MANDIBULAR
LIVER
SKIN
THYROID GLANDS
PARATHYROIDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFILTRATE, LYMPHOCYTE	1
MICRO:	CARDIOMYOPATHY	1
MICRO:	PLASMACYTOSIS, MEDULLARY	2
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	HYPERPLASIA, EPITHELIAL	1
MICRO:	CYST, ULTIMOBRANCHIAL	P
MICRO:	NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	ILEUM	JEJUNUM
	KIDNEYS	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
	SKELETAL MUSCLE	SPLEEN	SEMINAL VESICLES	TESTES
	PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82038 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.10	0.438
LIVER	14.56	3.033
KIDNEYS	3.24	0.675
SPLEEN	0.78	0.163
HEART	1.42	0.296
LUNGS	1.80	0.375
TESTIS, RT	1.56	0.325
TESTIS, LT	1.63	0.340
EPIDIDYMIS, RT	0.62	0.129
EPIDIDYMIS, LT	0.57	0.119
THYMUS	0.5409	0.113
ADRENAL GLANDS	0.0634	0.013
THYROIDS/PARATHY	0.0188	0.004
FINAL BODY WT(G)	480.	

EYES
LN, MANDIBULAR
LIVER
PROSTATE
NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO: INFILTRATE, NEUTROPHIL EXTRAOCULAR TISSUES				1
MICRO: PLASMACYTOSIS, MEDULLARY				1
MICRO: INFILTRATE, MONONUCLEAR				1
MICRO: INFILTRATE, LYMPHOCYTE				1
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
HEART	ILEUM	JEJUNUM	KIDNEYS	
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
TESTES	THYROID GLANDS	THYMUS	TRACHEA	
URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE	
MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN	
CECUM	COLON	DUODENUM	EPIDIDYMIDES	
ESOPHAGUS	NERVES, OPTIC	HEART	ILEUM	
JEJUNUM	KIDNEYS	LN, MESENTERIC	LUNGS	
NERVE, SCIATIC	PANCREAS	PITUITARY	RECTUM	
SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
TESTES	THYROID GLANDS	PARATHYROIDS	THYMUS	
TRACHEA	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82041 GROUP 2: 0 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.07	0.466
LIVER	12.70	2.860
KIDNEYS	3.26	0.734
SPLEEN	0.58	0.131
HEART	1.36	0.306
LUNGS	1.45	0.327
TESTIS, RT	1.60	0.360
TESTIS, LT	1.63	0.367
EPIDIDYMIS, RT	0.69	0.155
EPIDIDYMIS, LT	0.61	0.137
THYMUS	0.2991	0.067
ADRENAL GLANDS	0.0528	0.012
THYROIDS/PARATHY	0.0192	0.004
FINAL BODY WT(G)	444.	

HEART
LIVER
PARATHYROIDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	CARDIOMYOPATHY	2
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	ILEUM
	JEJUNUM	KIDNEYS	LN, MANDIBULAR	LN, MESENTERIC
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	THYROID GLANDS
	PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81982 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.15	0.468
LIVER	14.92	3.251
KIDNEYS	3.82	0.832
SPLEEN	0.67	0.146
HEART	1.38	0.301
LUNGS	1.43	0.312
TESTIS, RT	1.73	0.377
TESTIS, LT	1.78	0.388
EPIDIDYMIS, RT	0.58	0.126
EPIDIDYMIS, LT	0.61	0.133
THYMUS	0.2712	0.059
ADRENAL GLANDS	0.0827	0.018
THYROIDS/PARATHY	0.0230	0.005
FINAL BODY WT(G)	459.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	KIDNEYS
	LIVER	THYROID GLANDS	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81987 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.02	0.539
LIVER	10.96	2.923
KIDNEYS	2.74	0.731
SPLEEN	0.62	0.165
HEART	1.18	0.315
LUNGS	1.32	0.352
TESTIS, RT	1.58	0.421
TESTIS, LT	1.59	0.424
EPIDIDYMIS, RT	0.64	0.171
EPIDIDYMIS, LT	0.61	0.163
THYMUS	0.2065	0.055
ADRENAL GLANDS	0.0455	0.012
THYROIDS/PARATHY	0.0187	0.005
FINAL BODY WT(G)	375.	

HEART: NO SIGNIFICANT CHANGES OBSERVED

MICRO: CARDIOMYOPATHY GRADE 1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	KIDNEYS	LIVER
	THYROID GLANDS	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81994 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.17	0.492
LIVER	14.76	3.347
KIDNEYS	3.73	0.846
SPLEEN	0.81	0.184
HEART	1.27	0.288
LUNGS	1.52	0.345
TESTIS, RT	1.74	0.395
TESTIS, LT	1.76	0.399
EPIDIDYMIS, RT	0.66	0.150
EPIDIDYMIS, LT	0.62	0.141
THYMUS	0.2539	0.058
ADRENAL GLANDS	0.0579	0.013
THYROIDS/PARATHY	0.0180	0.004
FINAL BODY WT(G)	441.	

KIDNEYS
MICRO: CAST, HYALINE — GRADE 1
LIVER
MICRO: INFILTRATE, MONONUCLEAR — GRADE 1
THYROID GLANDS
MICRO: HYPERTROPHY, EPITHELIAL — GRADE 1
VACUOLATION, CYTOPLASMIC — GRADE 1
THYMUS
GROSS: AREA(S), DARK RED — GRADE P
MULTIPLE, PINPOINT
^==>
THYMUS: HEMORRHAGE
MICRO: HEMORRHAGE — GRADE 2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82001 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.13	0.452
LIVER	16.26	3.452
KIDNEYS	3.56	0.756
SPLEEN	0.89	0.189
HEART	1.53	0.325
LUNGS	1.41	0.299
TESTIS, RT	1.68	0.357
TESTIS, LT	1.69	0.359
EPIDIDYMIS, RT	0.64	0.136
EPIDIDYMIS, LT	0.63	0.134
THYMUS	0.4515	0.096
ADRENAL GLANDS	0.0707	0.015
THYROIDS/PARATHY	0.0189	0.004
FINAL BODY WT(G)	471.	

		GRADE
HEART	MICRO: CARDIOMYOPATHY	1
KIDNEYS	GROSS: DILATED PELVIS	3
	RIGHT	
^==>	KIDNEYS: DILATATION, PELVIS	
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE	1
	DILATATION, PELVIS	2
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82003 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.11	0.407
LIVER	15.09	2.913
KIDNEYS	3.30	0.637
SPLEEN	0.67	0.129
HEART	1.41	0.272
LUNGS	1.42	0.274
TESTIS, RT	1.59	0.307
TESTIS, LT	1.64	0.317
EPIDIDYMIS, RT	0.61	0.118
EPIDIDYMIS, LT	0.65	0.125
THYMUS	0.3240	0.063
ADRENAL GLANDS	0.0596	0.012
THYROIDS/PARATHY	0.0215	0.004
FINAL BODY WT(G)	518.	

HEART
KIDNEYS
LIVER
NO SIGNIFICANT
CHANGES OBSERVED

				GRADE
MICRO: CARDIOMYOPATHY				1
MICRO: DROPLET, HYALINE				1
BASOPHILIC TUBULES				1
MICRO: VACUOLATION, HEPATOCELLULAR, PERIPORTAL				1
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
HEART	ILEUM	JEJUNUM	KIDNEYS	
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
TESTES	THYROID GLANDS	THYMUS	TRACHEA	
URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	THYROID GLANDS	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82007 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.21	0.458
LIVER	16.00	3.313
KIDNEYS	3.73	0.772
SPLEEN	0.81	0.168
HEART	1.43	0.296
LUNGS	1.77	0.366
TESTIS, RT	1.79	0.371
TESTIS, LT	1.79	0.371
EPIDIDYMIS, RT	0.61	0.126
EPIDIDYMIS, LT	0.61	0.126
THYMUS	0.5196	0.108
ADRENAL GLANDS	0.0688	0.014
THYROIDS/PARATHY	0.0202	0.004
FINAL BODY WT(G)	483.	

HEART
LIVER
THYROID GLANDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	CARDIOMYOPATHY	1
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	KIDNEYS	THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82011 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.	HEART	GRADE
BRAIN	2.00	0.464	NO SIGNIFICANT	
LIVER	12.64	2.933	CHANGES OBSERVED	
KIDNEYS	3.19	0.740		
SPLEEN	0.65	0.151		
HEART	1.46	0.339		
LUNGS	1.48	0.343		
TESTIS, RT	1.69	0.392		
TESTIS, LT	1.63	0.378		
EPIDIDYMIS, RT	0.60	0.139		
EPIDIDYMIS, LT	0.57	0.132		
THYMUS	0.3216	0.075		
ADRENAL GLANDS	0.0668	0.015		
THYROIDS/PARATHY	0.0211	0.005		
FINAL BODY WT(G)	431.			

MICRO: CARDIOMYOPATHY 1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	KIDNEYS	LIVER
	THYROID GLANDS	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82016 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.17	0.427
LIVER	16.22	3.193
KIDNEYS	3.69	0.726
SPLEEN	0.70	0.138
HEART	1.71	0.337
LUNGS	1.55	0.305
TESTIS, RT	1.51	0.297
TESTIS, LT	1.55	0.305
EPIDIDYMIS, RT	0.66	0.130
EPIDIDYMIS, LT	0.63	0.124
THYMUS	0.2690	0.053
ADRENAL GLANDS	0.0616	0.012
THYROIDS/PARATHY	0.0210	0.004
FINAL BODY WT(G)	508.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
CECUM	GROSS: DISTENDED	P
	GAS FILLED	
HEART	MICRO: CARDIOMYOPATHY	1
ILEUM	GROSS: DISTENDED	P
	GAS FILLED	
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
STOMACH	GROSS: CONTENTS, THICK GREEN	P
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	JEJUNUM	KIDNEYS	LN, MANDIBULAR	LIVER
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	PANCREAS
	PITUITARY	PROSTATE	RECTUM	SPINAL CORD
	SAL. GLAND MAND	SKELETAL MUSCLE	SKIN	SPLEEN
	SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS
	TRACHEA	URINARY BLADDER	LN, AXILLARY	COAGULATING GL
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	KIDNEYS	THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 82022 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.85	0.436
LIVER	12.60	2.972
KIDNEYS	2.68	0.632
SPLEEN	0.70	0.165
HEART	1.36	0.321
LUNGS	1.65	0.389
TESTIS, RT	1.39	0.328
TESTIS, LT	1.38	0.325
EPIDIDYMIS, RT	0.58	0.137
EPIDIDYMIS, LT	0.55	0.130
THYMUS	0.4146	0.098
ADRENAL GLANDS	0.0481	0.011
THYROIDS/PARATHY	0.0181	0.004
FINAL BODY WT(G)	424.	

GENERAL COMMENT

HEART

^==> GROSS UNCONFIRMED

LIVER

^==> GROSS UNCONFIRMED

THYROID GLANDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
GROSS:	ORGAN DAMAGED AT NECROPSY	P
	ADRENAL GLAND, RIGHT	
MICRO:	CARDIOMYOPATHY	1
GROSS:	AREA(S), DEPRESSED	P
	FEW, IRREGULARLY SHAPED, IN CORTEX, BILATERAL	
GROSS:	AREA(S), WHITE	P
	ONE, IRREGULARLY SHAPED, IN MEDIAN CLEFT	
MICRO:	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	LN, MANDIBULAR
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	PANCREAS
	PITUITARY	PROSTATE	RECTUM	SPINAL CORD
	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	THYROID GLANDS
	THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY
	COAGULATING GL			
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	KIDNEYS	LIVER
	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 82024 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.06	0.509
LIVER	12.26	3.027
KIDNEYS	3.30	0.815
SPLEEN	0.56	0.138
HEART	1.38	0.341
LUNGS	1.46	0.360
TESTIS, RT	1.92	0.474
TESTIS, LT	1.95	0.481
EPIDIDYMIS, RT	0.59	0.146
EPIDIDYMIS, LT	0.61	0.151
THYMUS	0.2244	0.055
ADRENAL GLANDS	0.0604	0.015
THYROIDS/PARATHY	0.0212	0.005
FINAL BODY WT(G)	405.	

GENERAL COMMENT: KIDNEYS NO SIGNIFICANT CHANGES OBSERVED

					GRADE
GROSS: ORGAN DAMAGED AT NECROPSY					P
ADRENAL GLAND, LEFT					
MICRO: DROPLET, HYALINE					1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
	TESTES	THYROID GLANDS	THYMUS	TRACHEA	
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER	
	THYROID GLANDS	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82034 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.14	0.546
LIVER	10.66	2.719
KIDNEYS	3.10	0.791
SPLEEN	0.47	0.120
HEART	1.27	0.324
LUNGS	1.40	0.357
TESTIS, RT	1.56	0.398
TESTIS, LT	1.61	0.411
EPIDIDYMIS, RT	0.60	0.153
EPIDIDYMIS, LT	0.61	0.156
THYMUS	0.1923	0.049
ADRENAL GLANDS	0.0452	0.012
THYROIDS/PARATHY	0.0182	0.005
FINAL BODY WT(G)	392.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
ADRENAL CORTEX	MICRO: VACUOLATION, CYTOPLASMIC	1
DUODENUM	GROSS: CONTENTS, DARK GREEN	P
JEJUNUM	GROSS: CONTENTS, DARK GREEN	P
LN, MANDIBULAR	GROSS: DISCOLORATION, DARK RED BILATERAL	P
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
STOMACH	GROSS: CONTENTS, THICK GREEN	P
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	KIDNEYS	LIVER	LN, MESENTERIC
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL MEDULLA	HEART	KIDNEYS	THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82046 GROUP 3: 100 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.06	0.444
LIVER	15.40	3.319
KIDNEYS	3.71	0.800
SPLEEN	0.60	0.129
HEART	1.49	0.321
LUNGS	1.65	0.356
TESTIS, RT	1.44	0.310
TESTIS, LT	1.41	0.304
EPIDIDYMIS, RT	0.56	0.121
EPIDIDYMIS, LT	0.49	0.106
THYMUS	0.3104	0.067
ADRENAL GLANDS	0.0608	0.013
THYROIDS/PARATHY	0.0192	0.004
FINAL BODY WT(G)	464.	

ADRENAL CORTEX
KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
MICRO:	VACUOLATION, CYTOPLASMIC				1
MICRO:	DROPLET, HYALINE				1
	BASOPHILIC TUBULES				1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
	TESTES	THYROID GLANDS	THYMUS	TRACHEA	
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL MEDULLA	HEART	LIVER	THYROID GLANDS	
	THYMUS				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81993 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.00	0.542
LIVER	11.90	3.225
KIDNEYS	2.88	0.780
SPLEEN	0.61	0.165
HEART	1.11	0.301
LUNGS	1.21	0.328
TESTIS, RT	1.72	0.466
TESTIS, LT	1.68	0.455
EPIDIDYMIS, RT	0.66	0.179
EPIDIDYMIS, LT	0.61	0.165
THYMUS	0.2773	0.075
ADRENAL GLANDS	0.0474	0.013
THYROIDS/PARATHY	0.0187	0.005
FINAL BODY WT(G)	369.	

		GRADE
HEART	MICRO: CARDIOMYOPATHY	1
LIVER	GROSS: AREA(S), WHITE	P
	ONE, 1 MM IN DIAMETER, IN MEDIAN CLEFT	
^==>	GROSS UNCONFIRMED	
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	KIDNEYS	LIVER
	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 81995 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.04	0.514
LIVER	15.08	3.798
KIDNEYS	3.29	0.829
SPLEEN	0.54	0.136
HEART	1.49	0.375
LUNGS	1.36	0.343
TESTIS, RT	1.92	0.484
TESTIS, LT	1.89	0.476
EPIDIDYMIS, RT	0.64	0.161
EPIDIDYMIS, LT	0.69	0.174
THYMUS	0.2502	0.063
ADRENAL GLANDS	0.0631	0.016
THYROIDS/PARATHY	0.0189	0.005
FINAL BODY WT(G)	397.	

HEART
KIDNEYS
LIVER
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
MICRO: CARDIOMYOPATHY					1
MICRO: NEPHROPATHY, HYALINE DROPLET					1
DROPLET, HYALINE					1
MICRO: INFILTRATE, MONONUCLEAR					1
GROSS:ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR		
BRAIN	CECUM	COLON	DUODENUM		
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC		
HEART	ILEUM	JEJUNUM	KIDNEYS		
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS		
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE		
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH		
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES		
TESTES	THYROID GLANDS	THYMUS	TRACHEA		
URINARY BLADDER	LN, AXILLARY	COAGULATING GL			
MICRO:ADRENAL CORTEX	ADRENAL MEDULLA	THYROID GLANDS	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 82000 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.23	0.486
LIVER	16.04	3.495
KIDNEYS	3.56	0.776
SPLEEN	0.89	0.194
HEART	1.60	0.349
LUNGS	1.67	0.364
TESTIS, RT	1.91	0.416
TESTIS, LT	1.97	0.429
EPIDIDYMIS, RT	0.74	0.161
EPIDIDYMIS, LT	0.72	0.157
THYMUS	0.3683	0.080
ADRENAL GLANDS	0.0662	0.014
THYROIDS/PARATHY	0.0189	0.004
FINAL BODY WT(G)	459.	

KIDNEYS
LIVER
THYROID GLANDS
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
MICRO:	DROPLET, HYALINE				1
	NEPHROPATHY, CHRONIC PROGRESSIVE				1
MICRO:	INFILTRATE, MONONUCLEAR				1
MICRO:	HYPERTROPHY, EPITHELIAL				1
	VACUOLATION, CYTOPLASMIC				1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
	TESTES	THYROID GLANDS	THYMUS	TRACHEA	
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82002 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.23	0.492
LIVER	16.18	3.572
KIDNEYS	3.68	0.812
SPLEEN	0.65	0.143
HEART	1.45	0.320
LUNGS	1.54	0.340
TESTIS, RT	1.91	0.422
TESTIS, LT	1.87	0.413
EPIDIDYMIS, RT	0.71	0.157
EPIDIDYMIS, LT	0.69	0.152
THYMUS	0.2870	0.063
ADRENAL GLANDS	0.0783	0.017
THYROIDS/PARATHY	0.0175	0.004
FINAL BODY WT(G)	453.	

KIDNEYS
THYROID GLANDS
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
MICRO:	DROPLET, HYALINE				1
MICRO:	HYPERTROPHY, EPITHELIAL VACUOLATION, CYTOPLASMIC				1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
	TESTES	THYROID GLANDS	THYMUS	TRACHEA	
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER	
	THYMUS				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82005 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.24	0.490
LIVER	18.48	4.044
KIDNEYS	3.91	0.856
SPLEEN	0.65	0.142
HEART	1.48	0.324
LUNGS	1.46	0.319
TESTIS, RT	1.78	0.389
TESTIS, LT	1.75	0.383
EPIDIDYMIS, RT	0.64	0.140
EPIDIDYMIS, LT	0.64	0.140
THYMUS	0.2716	0.059
ADRENAL GLANDS	0.0701	0.015
THYROIDS/PARATHY	0.0239	0.005
FINAL BODY WT(G)	457.	

		GRADE
ADRENAL CORTEX	MICRO: VACUOLATION, CYTOPLASMIC	1
HEART	MICRO: CARDIOMYOPATHY	1
	PIGMENT, BROWN	1
KIDNEYS	MICRO: DROPLET, HYALINE	2
	NEPHROPATHY, CHRONIC PROGRESSIVE	1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL MEDULLA	LIVER	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82013 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.08	0.494
LIVER	13.45	3.195
KIDNEYS	3.10	0.736
SPLEEN	0.62	0.147
HEART	1.33	0.316
LUNGS	1.95	0.463
TESTIS, RT	1.85	0.439
TESTIS, LT	1.86	0.442
EPIDIDYMIS, RT	0.70	0.166
EPIDIDYMIS, LT	0.72	0.171
THYMUS	0.2440	0.058
ADRENAL GLANDS	0.0535	0.013
THYROIDS/PARATHY	0.0192	0.005
FINAL BODY WT(G)	421.	

		GRADE
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE	1
LIVER	MICRO: VACUOLATION, HEPATOCELLULAR, PERIPORTAL	1
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
THYMUS	GROSS: AREA(S), DARK RED	P
	MULTIPLE, PINPOINT TO 1 MM IN DIAMETER	
^==>	THYMUS: HEMORRHAGE	
THYMUS	MICRO: HEMORRHAGE	2
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82015 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.482
LIVER	15.68	3.724
KIDNEYS	3.26	0.774
SPLEEN	0.69	0.164
HEART	1.35	0.321
LUNGS	1.38	0.328
TESTIS, RT	1.74	0.413
TESTIS, LT	1.81	0.430
EPIDIDYMIS, RT	0.59	0.140
EPIDIDYMIS, LT	0.60	0.143
THYMUS	0.3235	0.077
ADRENAL GLANDS	0.0539	0.013
THYROIDS/PARATHY	0.0182	0.004
FINAL BODY WT(G)	421.	

KIDNEYS
LIVER
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
MICRO:	DROPLET, HYALINE				1
	NEPHROPATHY, HYALINE DROPLET				1
MICRO:	INFILTRATE, MONONUCLEAR				1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
	TESTES	THYROID GLANDS	THYMUS	TRACHEA	
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	THYROID GLANDS	
	THYMUS				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82023 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.99	0.436
LIVER	16.94	3.715
KIDNEYS	3.85	0.844
SPLEEN	0.64	0.140
HEART	1.56	0.342
LUNGS	1.52	0.333
TESTIS, RT	1.76	0.386
TESTIS, LT	1.74	0.382
EPIDIDYMIS, RT	0.69	0.151
EPIDIDYMIS, LT	0.66	0.145
THYMUS	0.4021	0.088
ADRENAL GLANDS	0.0550	0.012
THYROIDS/PARATHY	0.0179	0.004
FINAL BODY WT(G)	456.	

		GRADE
ADRENAL CORTEX	MICRO: VACUOLATION, CYTOPLASMIC	1
HEART	MICRO: CARDIOMYOPATHY	1
KIDNEYS	MICRO: DROPLET, HYALINE	1
LIVER	MICRO: VACUOLATION, HEPATOCELLULAR, PERIPORTAL	1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
THYMUS	GROSS: AREA(S), DARK RED	P
	FEW, PINPOINT	
^==>	THYMUS: HEMORRHAGE	
THYMUS	MICRO: HEMORRHAGE	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, FEMUR; BRAIN, CECUM, COLON, DUODENUM; EPIDIDYMIDES, ESOPHAGUS, EYES, NERVES, OPTIC; HEART, ILEUM, JEJUNUM, KIDNEYS; LN, MANDIBULAR, LIVER, LN, MESENTERIC, LUNGS; NERVE, SCIATIC, PANCREAS, PITUITARY, PROSTATE; RECTUM, SPINAL CORD, SAL. GLAND MAND, STOMACH; SKELETAL MUSCLE, SKIN, SPLEEN, SEMINAL VESICLES; TESTES, THYROID GLANDS, TRACHEA, URINARY BLADDER; LN, AXILLARY, COAGULATING GL

MICRO: ADRENAL MEDULLA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 82031 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.93	0.417
LIVER	17.09	3.691
KIDNEYS	3.92	0.847
SPLEEN	0.61	0.132
HEART	1.48	0.320
LUNGS	1.46	0.315
TESTIS, RT	1.87	0.404
TESTIS, LT	1.92	0.415
EPIDIDYMIS, RT	0.71	0.153
EPIDIDYMIS, LT	0.69	0.149
THYMUS	0.2268	0.049
ADRENAL GLANDS	0.0655	0.014
THYROIDS/PARATHY	0.0222	0.005
FINAL BODY WT(G)	463.	

HEART
KIDNEYS
THYROID GLANDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	CARDIOMYOPATHY	1
MICRO:	DROPLET, HYALINE	1
MICRO:	CYST, ULTIMOBRANCHIAL	P
	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	LIVER	THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A89 (F0 MALES -SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 82036 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.11	0.423
LIVER	17.50	3.507
KIDNEYS	3.74	0.749
SPLEEN	0.80	0.160
HEART	1.53	0.307
LUNGS	1.45	0.291
TESTIS, RT	1.90	0.381
TESTIS, LT	2.15	0.431
EPIDIDYMIS, RT	0.64	0.128
EPIDIDYMIS, LT	0.69	0.138
THYMUS	0.3476	0.070
ADRENAL GLANDS	0.0558	0.011
THYROIDS/PARATHY	0.0202	0.004
FINAL BODY WT(G)	499.	

ADRENAL CORTEX
HEART
KIDNEYS
THYROID GLANDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	VACUOLATION, CYTOPLASMIC	1
MICRO:	CARDIOMYOPATHY	1
MICRO:	DROPLET, HYALINE	1
MICRO:	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL MEDULLA	LIVER	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82039 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.486
LIVER	15.81	3.746
KIDNEYS	3.59	0.851
SPLEEN	0.65	0.154
HEART	1.39	0.329
LUNGS	1.39	0.329
TESTIS, RT	1.65	0.391
TESTIS, LT	1.66	0.393
EPIDIDYMIS, RT	0.64	0.152
EPIDIDYMIS, LT	0.64	0.152
THYMUS	0.2323	0.055
ADRENAL GLANDS	0.0629	0.015
THYROIDS/PARATHY	0.0205	0.005
FINAL BODY WT(G)	422.	

HEART
KIDNEYS
LIVER
THYROID GLANDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	CARDIOMYOPATHY	1
MICRO:	DROPLET, HYALINE	1
	NEPHROPATHY, CHRONIC PROGRESSIVE	1
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82044 GROUP 4: 300 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.11	0.472
LIVER	14.18	3.172
KIDNEYS	3.57	0.799
SPLEEN	0.68	0.152
HEART	1.40	0.313
LUNGS	1.68	0.376
TESTIS, RT	1.57	0.351
TESTIS, LT	1.58	0.353
EPIDIDYMIS, RT	0.61	0.136
EPIDIDYMIS, LT	0.56	0.125
THYMUS	0.3466	0.078
ADRENAL GLANDS	0.0621	0.014
THYROIDS/PARATHY	0.0235	0.005
FINAL BODY WT(G)	447.	

HEART
KIDNEYS
LIVER
THYMUS
NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO: CARDIOMYOPATHY				1
MICRO: DROPLET, HYALINE				1
MICRO: INFILTRATE, MONONUCLEAR				1
MICRO: HEMORRHAGE				1
GROSS:ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
HEART	ILEUM	JEJUNUM	KIDNEYS	
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES	
TESTES	THYROID GLANDS	THYMUS	TRACHEA	
URINARY BLADDER	LN, AXILLARY	COAGULATING GL		
MICRO:ADRENAL CORTEX	ADRENAL MEDULLA	THYROID GLANDS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82006 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.04	0.436
LIVER	21.62	4.620
KIDNEYS	4.52	0.966
SPLEEN	0.71	0.152
HEART	1.50	0.321
LUNGS	1.36	0.291
TESTIS, RT	1.80	0.385
TESTIS, LT	1.75	0.374
EPIDIDYMIS, RT	0.63	0.135
EPIDIDYMIS, LT	0.58	0.124
THYMUS	0.3397	0.073
ADRENAL GLANDS	0.0719	0.015
THYROIDS/PARATHY	0.0190	0.004
FINAL BODY WT(G)	468.	

EPIDIDYMIDES
HEART
KIDNEYS

LN, MANDIBULAR
LIVER

PROSTATE
TESTES
THYROID GLANDS

NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	LUMINAL DEBRIS, CELLULAR	1
MICRO:	CARDIOMYOPATHY	1
MICRO:	NEPHROPATHY, HYALINE DROPLET	1
	DROPLET, HYALINE	2
MICRO:	PLASMACYTOSIS, MEDULLARY	1
MICRO:	INFILTRATE, MONONUCLEAR	1
	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
MICRO:	INFLAMMATION, SUPPURATIVE	1
MICRO:	DEGENERATION, SEMINIFEROUS TUBULES	1
MICRO:	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	ILEUM	JEJUNUM
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	PARATHYROIDS	THYMUS
	TRACHEA	URINARY BLADDER	LN, AXILLARY	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82009 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.01	0.451
LIVER	23.62	5.296
KIDNEYS	4.43	0.993
SPLEEN	0.68	0.152
HEART	1.44	0.323
LUNGS	1.40	0.314
TESTIS, RT	1.82	0.408
TESTIS, LT	1.76	0.395
EPIDIDYMIS, RT	0.73	0.164
EPIDIDYMIS, LT	0.66	0.148
THYMUS	0.2252	0.050
ADRENAL GLANDS	0.0491	0.011
THYROIDS/PARATHY	0.0209	0.005
FINAL BODY WT(G)	446.	

NO SIGNIFICANT CHANGES OBSERVED

			GRADE
ADRENAL CORTEX	MICRO:	VACUOLATION, CYTOPLASMIC	1
HEART	MICRO:	CARDIOMYOPATHY	1
KIDNEYS	GROSS:	PALE	P
		BILATERAL	
^==>	KIDNEYS:	NEPHROPATHY, HYALINE DROPLET	
KIDNEYS	MICRO:	NEPHROPATHY, HYALINE DROPLET	2
		DROPLET, HYALINE	1
LN, MANDIBULAR	MICRO:	PLASMACYTOSIS, MEDULLARY	1
LIVER	MICRO:	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
		INFILTRATE, MONONUCLEAR	1
THYROID GLANDS	MICRO:	HYPERTROPHY, EPITHELIAL	1
		VACUOLATION, CYTOPLASMIC	1
PARATHYROIDS	MICRO:	NO SIGNIFICANT CHANGES OBSERVED	
		ONE OF PAIR PRESENT	

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL MEDULLA	AORTA	STERNEBRAE	MARROW, STERN
	FEMUR	MARROW, FEMUR	BRAIN	CECUM
	COLON	DUODENUM	EPIDIDYMIDES	ESOPHAGUS
	EYES	NERVES, OPTIC	ILEUM	JEJUNUM
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	PANCREAS
	PITUITARY	PROSTATE	RECTUM	SPINAL CORD

ANIMAL NO. 82009 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

GRADE

SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE
SKIN	SPLEEN	SEMINAL VESICLES	TESTES
PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
LN, AXILLARY	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82010 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.01	0.488
LIVER	21.96	5.330
KIDNEYS	3.92	0.951
SPLEEN	0.66	0.160
HEART	1.46	0.354
LUNGS	1.47	0.357
TESTIS, RT	1.57	0.381
TESTIS, LT	1.62	0.393
EPIDIDYMIS, RT	0.62	0.150
EPIDIDYMIS, LT	0.61	0.148
THYMUS	0.2340	0.057
ADRENAL GLANDS	0.0617	0.015
THYROIDS/PARATHY	0.0219	0.005
FINAL BODY WT(G)	412.	

ADRENAL CORTEX
HEART
KIDNEYS

LN, MANDIBULAR
LIVER

LN, MESENTERIC
THYROID GLANDS

NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	VACUOLATION, CYTOPLASMIC	1
MICRO:	CARDIOMYOPATHY	1
MICRO:	NEPHROPATHY, HYALINE DROPLET	2
	DROPLET, HYALINE	1
	NEPHROPATHY, CHRONIC PROGRESSIVE	1
MICRO:	PLASMACYTOSIS, MEDULLARY	1
MICRO:	INFILTRATE, MONONUCLEAR	1
	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
MICRO:	ERYTHROCYTOSIS, SINUS	2
MICRO:	CYST, ULTIMOBRANCHIAL	P
	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL MEDULLA	AORTA	STERNEBRAE	MARROW, STERN
	FEMUR	MARROW, FEMUR	BRAIN	CECUM
	COLON	DUODENUM	EPIDIDYMIDES	ESOPHAGUS
	EYES	NERVES, OPTIC	ILEUM	JEJUNUM
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	PARATHYROIDS
	THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY

ANIMAL NO. 82010 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

	GRADE
COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82018 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.97	0.475
LIVER	19.88	4.790
KIDNEYS	3.76	0.906
SPLEEN	0.64	0.154
HEART	1.23	0.296
LUNGS	1.28	0.308
TESTIS, RT	1.68	0.405
TESTIS, LT	1.63	0.393
EPIDIDYMIS, RT	0.63	0.152
EPIDIDYMIS, LT	0.61	0.147
THYMUS	0.2786	0.067
ADRENAL GLANDS	0.0531	0.013
THYROIDS/PARATHY	0.0193	0.005
FINAL BODY WT(G)	415.	

			GRADE
KIDNEYS	GROSS:	PALE	P
		BILATERAL	
^==>	KIDNEYS:	NEPHROPATHY, HYALINE DROPLET	
KIDNEYS	GROSS:	AREA(S), DARK RED	P
		MULTIPLE, IRREGULARLY SHAPED, IN CORTEX, BILATERAL	
^==>	GROSS UNCONFIRMED		
KIDNEYS	MICRO:	NEPHROPATHY, HYALINE DROPLET	1
		DROPLET, HYALINE	1
		NEPHROPATHY, CHRONIC PROGRESSIVE	1
LN, MANDIBULAR	MICRO:	PLASMACYTOSIS, MEDULLARY	1
LIVER	MICRO:	INFILTRATE, MONONUCLEAR	1
		HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
SKELETAL MUSCLE	MICRO:	INFILTRATE, MONONUCLEAR	1
THYROID GLANDS	MICRO:	HYPERTROPHY, EPITHELIAL	1
		VACUOLATION, CYTOPLASMIC	1
PARATHYROIDS	MICRO:	NO SIGNIFICANT CHANGES OBSERVED	
		ONE OF PAIR PRESENT	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES

ANIMAL NO. 82018 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

GRADE

ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
STOMACH, NON	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	PARATHYROIDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82028 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.09	0.496
LIVER	21.01	4.990
KIDNEYS	4.10	0.974
SPLEEN	0.64	0.152
HEART	1.48	0.352
LUNGS	1.53	0.363
TESTIS, RT	2.02	0.480
TESTIS, LT	2.05	0.487
EPIDIDYMIS, RT	0.74	0.176
EPIDIDYMIS, LT	0.74	0.176
THYMUS	0.2132	0.051
ADRENAL GLANDS	0.0619	0.015
THYROIDS/PARATHY	0.0239	0.006
FINAL BODY WT(G)	421.	

EYES
KIDNEYS
LIVER
THYROID GLANDS
NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO:	NO SIGNIFICANT CHANGES OBSERVED			
	ONLY ONE CORNEA IN SECTION			
MICRO:	NEPHROPATHY, CHRONIC PROGRESSIVE			2
	NEPHROPATHY, HYALINE DROPLET			2
	DROPLET, HYALINE			2
MICRO:	INFILTRATE, MONONUCLEAR			1
	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR			1
MICRO:	HYPERTROPHY, EPITHELIAL			1
	VACUOLATION, CYTOPLASMIC			1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	LN, MANDIBULAR	LN, MESENTERIC
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	THYMUS
	TRACHEA	URINARY BLADDER	LN, AXILLARY	COAGULATING GL

ANIMAL NO. 82028 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

GRADE

NOT PRESENT FOR EXAMINATION

MICRO:PARATHYROIDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82029 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.10	0.521
LIVER	17.73	4.400
KIDNEYS	3.52	0.873
SPLEEN	0.74	0.184
HEART	1.31	0.325
LUNGS	1.70	0.422
TESTIS, RT	1.65	0.409
TESTIS, LT	1.56	0.387
EPIDIDYMIS, RT	0.67	0.166
EPIDIDYMIS, LT	0.63	0.156
THYMUS	0.2845	0.071
ADRENAL GLANDS	0.0665	0.017
THYROIDS/PARATHY	0.0196	0.005
FINAL BODY WT(G)	403.	

		GRADE
KIDNEYS	GROSS: PALE	P
^==>	BILATERAL	
	KIDNEYS: NEPHROPATHY, HYALINE DROPLET	
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE	1
	NEPHROPATHY, HYALINE DROPLET	1
	DROPLET, HYALINE	1
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED	
	ONE OF PAIR PRESENT	
URINARY BLADDER	GROSS: DISTENDED	P
^==> GROSS UNCONFIRMED		
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	THYMUS	TRACHEA	LN, AXILLARY
	COAGULATING GL			
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	LN, MANDIBULAR	LN, MESENTERIC
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND

ANIMAL NO. 82029 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

				GRADE
STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN	
SPLEEN	SEMINAL VESICLES	TESTES	PARATHYROIDS	
THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY	
COAGULATING GL				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82030 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.00	0.517
LIVER	18.64	4.817
KIDNEYS	3.00	0.775
SPLEEN	0.61	0.158
HEART	1.30	0.336
LUNGS	1.49	0.385
TESTIS, RT	1.65	0.426
TESTIS, LT	1.58	0.408
EPIDIDYMIS, RT	0.62	0.160
EPIDIDYMIS, LT	0.62	0.160
THYMUS	0.3839	0.099
ADRENAL GLANDS	0.0592	0.015
THYROIDS/PARATHY	0.0193	0.005
FINAL BODY WT(G)	387.	

			GRADE
HEART	MICRO:	CARDIOMYOPATHY	1
KIDNEYS	GROSS:	PALE	P
		BILATERAL	
^==>	KIDNEYS:	NEPHROPATHY, HYALINE DROPLET	
KIDNEYS	MICRO:	NEPHROPATHY, HYALINE DROPLET	1
		DROPLET, HYALINE	1
LN, MANDIBULAR	MICRO:	PLASMACYTOSIS, MEDULLARY	1
LIVER	MICRO:	INFILTRATE, MONONUCLEAR	1
		HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
PROSTATE	MICRO:	INFILTRATE, LYMPHOCYTE	1
THYROID GLANDS	MICRO:	HYPERTROPHY, EPITHELIAL	1
		VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED			

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	ILEUM
	JEJUNUM	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	RECTUM	SPINAL CORD
	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE
	SKIN	SPLEEN	SEMINAL VESICLES	TESTES
	PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER

ANIMAL NO. 82030 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

	GRADE
LN, AXILLARY	
COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82035 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.488
LIVER	21.09	5.021
KIDNEYS	3.76	0.895
SPLEEN	0.56	0.133
HEART	1.38	0.329
LUNGS	1.36	0.324
TESTIS, RT	1.85	0.440
TESTIS, LT	1.83	0.436
EPIDIDYMIS, RT	0.68	0.162
EPIDIDYMIS, LT	0.64	0.152
THYMUS	0.2940	0.070
ADRENAL GLANDS	0.0543	0.013
THYROIDS/PARATHY	0.0198	0.005
FINAL BODY WT(G)	420.	

EYES
NERVES, OPTIC
HEART
KIDNEYS
THYROID GLANDS
NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO:	INFILTRATE, NEUTROPHIL			1
	EXTRAOCULAR TISSUES			
MICRO:	NO SIGNIFICANT CHANGES OBSERVED			
	ONE OF PAIR PRESENT			
MICRO:	CARDIOMYOPATHY			1
MICRO:	DROPLET, HYALINE			1
	NEPHROPATHY, HYALINE DROPLET			1
MICRO:	CYST, ULTIMOBRANCHIAL			P
	HYPERTROPHY, EPITHELIAL			1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	NERVES, OPTIC	ILEUM	JEJUNUM
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
	STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN
	SEMINAL VESICLES	TESTES	PARATHYROIDS	THYMUS
	TRACHEA	URINARY BLADDER	LN, AXILLARY	COAGULATING GL

ANIMAL NO. 82035 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82037 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.96	0.494
LIVER	17.61	4.436
KIDNEYS	3.43	0.864
SPLEEN	0.67	0.169
HEART	1.20	0.302
LUNGS	1.32	0.332
TESTIS, RT	1.46	0.368
TESTIS, LT	1.49	0.375
EPIDIDYMIS, RT	0.68	0.171
EPIDIDYMIS, LT	0.63	0.159
THYMUS	0.2081	0.052
ADRENAL GLANDS	0.0470	0.012
THYROIDS/PARATHY	0.0229	0.006
FINAL BODY WT(G)	397.	

GENERAL COMMENT
HEART
SKELETAL MUSCLE
NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
GROSS:	ORGAN DAMAGED AT NECROPSY	P
	BRAIN	
MICRO:	CARDIOMYOPATHY	1
MICRO:	INFILTRATE, MONONUCLEAR	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	ILEUM
	JEJUNUM	KIDNEYS	LN, MANDIBULAR	LIVER
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	PANCREAS
	PITUITARY	PROSTATE	RECTUM	SPINAL CORD
	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	THYROID GLANDS
	PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
	LN, AXILLARY	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82040 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.479
LIVER	21.00	4.907
KIDNEYS	4.06	0.949
SPLEEN	0.59	0.138
HEART	1.18	0.276
LUNGS	1.33	0.311
TESTIS, RT	1.80	0.421
TESTIS, LT	1.77	0.414
EPIDIDYMIS, RT	0.73	0.171
EPIDIDYMIS, LT	0.69	0.161
THYMUS	0.2078	0.049
ADRENAL GLANDS	0.0648	0.015
THYROIDS/PARATHY	0.0195	0.005
FINAL BODY WT(G)	428.	

		GRADE
KIDNEYS	GROSS: PALE	P
	BILATERAL	
^==>	KIDNEYS: NEPHROPATHY, HYALINE DROPLET	
KIDNEYS	MICRO: NEPHROPATHY, HYALINE DROPLET	2
	NEPHROPATHY, CHRONIC PROGRESSIVE	1
	DROPLET, HYALINE	1
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
PANCREAS	PITUITARY	PROSTATE	RECTUM
SPINAL CORD	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE
SKIN	SPLEEN	SEMINAL VESICLES	TESTES
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
LN, AXILLARY	COAGULATING GL		

MICRO:

ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
CECUM	COLON	DUODENUM	EPIDIDYMIDES
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	LN, MANDIBULAR	LN, MESENTERIC
LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
SPLEEN	SEMINAL VESICLES	TESTES	PARATHYROIDS
THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY
COAGULATING GL			

ANIMAL NO. 82040 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 82042 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.540
LIVER	17.04	4.532
KIDNEYS	3.28	0.872
SPLEEN	0.62	0.165
HEART	1.25	0.332
LUNGS	1.32	0.351
TESTIS, RT	1.48	0.394
TESTIS, LT	1.49	0.396
EPIDIDYMIS, RT	0.53	0.141
EPIDIDYMIS, LT	0.49	0.130
THYMUS	0.3834	0.102
ADRENAL GLANDS	0.0605	0.016
THYROIDS/PARATHY	0.0210	0.006
FINAL BODY WT(G)	376.	

BRAIN
ESOPHAGUS
HEART
KIDNEYS

LN, MANDIBULAR
LN, MESENTERIC
THYROID GLANDS

NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	GLIAL REST	(1)
MICRO:	DEGENERATION, MUSCLE	1
MICRO:	CARDIOMYOPATHY	1
MICRO:	DROPLET, HYALINE	1
	INFILTRATE, MONONUCLEAR	1
MICRO:	PLASMACYTOSIS, MEDULLARY	1
MICRO:	ERYTHROCYTOSIS, SINUS	1
MICRO:	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	CECUM
	COLON	DUODENUM	EPIDIDYMIDES	EYES
	NERVES, OPTIC	ILEUM	JEJUNUM	LIVER
	LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
	PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	SEMINAL VESICLES	TESTES	PARATHYROIDS
	THYMUS	TRACHEA	URINARY BLADDER	LN, AXILLARY
	COAGULATING GL			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
( )-FOCAL/SOLITARY, (( ))-MULTIFOCAL/MULTIPLE, NO PARENTHESES-NOT SPECIFIED

ANIMAL NO. 82043 GROUP 5: 900 MG/KG MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT
BRAIN	1.99	0.535	
LIVER	18.11	4.868	HEART
KIDNEYS	3.45	0.927	KIDNEYS
SPLEEN	0.53	0.142	LN, MANDIBULAR
HEART	1.11	0.298	LIVER
LUNGS	1.32	0.355	
TESTIS, RT	1.48	0.398	THYROID GLANDS
TESTIS, LT	1.58	0.425	
EPIDIDYMIS, RT	0.57	0.153	NO SIGNIFICANT
EPIDIDYMIS, LT	0.60	0.161	CHANGES OBSERVED
THYMUS	0.2152	0.058	
ADRENAL GLANDS	0.0653	0.018	
THYROIDS/PARATHY	0.0185	0.005	
FINAL BODY WT(G)	372.		

				GRADE
GROSS:	ORGAN DAMAGED AT NECROPSY			P
	RECTUM			
MICRO:	CARDIOMYOPATHY			1
MICRO:	DROPLET, HYALINE			1
MICRO:	PLASMACYTOSIS, MEDULLARY			1
MICRO:	INFILTRATE, MONONUCLEAR			1
	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR			1
MICRO:	HYPERTROPHY, EPITHELIAL			1
	VACUOLATION, CYTOPLASMIC			1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	THYROID GLANDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES	NERVES, OPTIC	ILEUM
	JEJUNUM	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	PANCREAS	PITUITARY	PROSTATE	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
	SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
	TESTES	PARATHYROIDS	THYMUS	TRACHEA
	URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81985 GROUP 6: 60 MG/KG CYC MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.17	0.491
LIVER	15.69	3.550
KIDNEYS	3.40	0.769
SPLEEN	0.56	0.127
HEART	1.47	0.333
LUNGS	2.01	0.455
TESTIS, RT	1.78	0.403
TESTIS, LT	1.80	0.407
EPIDIDYMIS, RT	0.67	0.152
EPIDIDYMIS, LT	0.64	0.145
THYMUS	0.2236	0.051
ADRENAL GLANDS	0.0693	0.016
THYROIDS/PARATHY	0.0202	0.005
FINAL BODY WT(G)	442.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81992 GROUP 6: 60 MG/KG CYC MALE SCHEDULED EUTH 10/21/10 DATE OF DEATH: 10/21/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.431
LIVER	16.62	3.529
KIDNEYS	3.66	0.777
SPLEEN	0.58	0.123
HEART	1.53	0.325
LUNGS	1.54	0.327
TESTIS, RT	1.94	0.412
TESTIS, LT	1.94	0.412
EPIDIDYMIS, RT	0.67	0.142
EPIDIDYMIS, LT	0.64	0.136
THYMUS	0.2104	0.045
ADRENAL GLANDS	0.0610	0.013
THYROIDS/PARATHY	0.0197	0.004
FINAL BODY WT(G)	471.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82008 GROUP 6: 60 MG/KG CYC MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.444
LIVER	14.37	3.110
KIDNEYS	3.39	0.734
SPLEEN	0.53	0.115
HEART	1.60	0.346
LUNGS	1.51	0.327
TESTIS, RT	1.53	0.331
TESTIS, LT	1.53	0.331
EPIDIDYMIS, RT	0.62	0.134
EPIDIDYMIS, LT	0.59	0.128
THYMUS	0.1663	0.036
ADRENAL GLANDS	0.0656	0.014
THYROIDS/PARATHY	0.0229	0.005
FINAL BODY WT(G)	462.	

					GRADE
SKIN	GROSS: MATTING, BROWN				P
NO SIGNIFICANT	ENTIRE VENTRAL SURFACE				
CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS	
	NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE	
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
	SKELETAL MUSCLE	SPLEEN	SEMINAL VESICLES	TESTES	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	LN, AXILLARY	COAGULATING GL			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82026 GROUP 6: 60 MG/KG CYC MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.18	0.440
LIVER	18.14	3.665
KIDNEYS	4.61	0.931
SPLEEN	0.49	0.099
HEART	1.60	0.323
LUNGS	1.68	0.339
TESTIS, RT	1.84	0.372
TESTIS, LT	1.79	0.362
EPIDIDYMIS, RT	0.69	0.139
EPIDIDYMIS, LT	0.68	0.137
THYMUS	0.1333	0.027
ADRENAL GLANDS	0.0777	0.016
THYROIDS/PARATHY	0.0283	0.006
FINAL BODY WT(G)	495.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 82033 GROUP 6: 60 MG/KG CYC MALE SCHEDULED EUTH 10/22/10 DATE OF DEATH: 10/22/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.88	0.410
LIVER	14.50	3.159
KIDNEYS	3.11	0.678
SPLEEN	0.44	0.096
HEART	1.44	0.314
LUNGS	1.37	0.298
TESTIS, RT	1.75	0.381
TESTIS, LT	1.66	0.362
EPIDIDYMIS, RT	0.59	0.129
EPIDIDYMIS, LT	0.57	0.124
THYMUS	0.1368	0.030
ADRENAL GLANDS	0.0610	0.013
THYROIDS/PARATHY	0.0206	0.004
FINAL BODY WT(G)	459.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	KIDNEYS
LN, MANDIBULAR	LIVER	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	SEMINAL VESICLES
TESTES	THYROID GLANDS	THYMUS	TRACHEA
URINARY BLADDER	LN, AXILLARY	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A90 (F0 FEMALES - UNSCHEDULED DEATH)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81964 GROUP 5: 900 MG/KG FEMALE EUTH IN EXTREMIS 11/03/10 DATE OF DEATH: 11/03/10

			GRADE
	GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,9	P
	GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 6,9	P
	ADRENAL GLANDS	GROSS: PALE BILATERAL	P
	^==> GROSS	UNCONFIRMED	
	MARROW, STERN	MICRO: HYPOCELLULAR	1
	MARROW, FEMUR	MICRO: HYPOCELLULAR	1
	BRAIN	GROSS: PALE	P
	^==> GROSS	UNCONFIRMED	
	COLON	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA	1
	NERVES, OPTIC	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
	ILEUM	MICRO: INFILTRATE, MONONUCLEAR	1
	KIDNEYS	MICRO: DILATATION, TUBULAR WIDESPREAD THROUGHOUT CORTEX, TUBULES HAVE ATTENUATED EPITHELIUM AND LUMENS ARE FILLED WITH GRANULAR EOSINOPHILIC MATERIAL	3
	LIVER	GROSS: AREA(S), WHITE MULTIPLE, IRREGULARLY SHAPED, ALL LOBES	P
	^==>	LIVER: NECROSIS, COAGULATIVE	
	^==>	LIVER: VACUOLATION, HEPATOCELLULAR	
	LIVER	MICRO: HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
		NECROSIS, COAGULATIVE	2
		VACUOLATION, HEPATOCELLULAR	2

ANIMAL NO. 81964 GROUP 5: 900 MG/KG FEMALE EUTH IN EXTREMIS 11/03/10 DATE OF DEATH: 11/03/10

				GRADE
			MULTIFOCAL, CENTRILOBULAR, COALESCING	
	MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC		2
		LACTATION		
	PITUITARY	GROSS: PALE		P
	^==> GROSS	UNCONFIRMED		
	STOMACH	GROSS: DISTENDED		P
	^==> GROSS	UNCONFIRMED		
	STOMACH, GLAN	MICRO: NECROSIS		((1))
		MIDZONAL WITH MINIMAL NEUTROPHILIC INFILTRATE		
	SPLEEN	MICRO: DEPLETION		3
		RED PULP		
		CONTRACTED		P
	THYMUS	GROSS: SMALL		P
	^==>	THYMUS: DEPLETION, LYMPHOID, CORTEX		
	THYMUS	MICRO: DEPLETION, LYMPHOID, CORTEX		4
	VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL		P
	CERVIX	MICRO: INFLAMMATION, ACUTE		1
	UTERUS	MICRO: INFLAMMATION, ACUTE		2
		INVOLUTION		P
CAUSE OF DEATH:	UTERUS	MICRO: INFLAMMATION, ACUTE		2
	NO SIGNIFICANT			
	CHANGES OBSERVED	GROSS: AORTA	STERNEBRAE	FEMUR	CECUM
		COLON	DUODENUM	ESOPHAGUS	EYES
		NERVES, OPTIC	HEART	ILEUM	JEJUNUM
		KIDNEYS	LN, MANDIBULAR	LN, MESENTERIC	LUNGS
		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES
		PANCREAS	RECTUM	SPINAL CORD	SAL. GLAND MAND
		SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS

ANIMAL NO. 81964 GROUP 5: 900 MG/KG FEMALE EUTH IN EXTREMIS 11/03/10 DATE OF DEATH: 11/03/10

GRADE

	TRACHEA	URINARY BLADDER	VAGINA	CERVIX
	LN, AXILLARY	UTERUS		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	FEMUR	BRAIN	CECUM	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	JEJUNUM	LN, MANDIBULAR	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, NON	SKELETAL MUSCLE	SKIN	THYROID GLANDS
	PARATHYROIDS	TRACHEA	URINARY BLADDER	LN, AXILLARY

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
( )-FOCAL/SOLITARY, (( ))-MULTIFOCAL/MULTIPLE, NO PARENTHESES-NOT SPECIFIED
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

TABLE A91 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81932 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT		GRADE
BRAIN	1.83	0.680	KIDNEYS	MICRO: MINERALIZATION	1
LIVER	8.88	3.301		INFILTRATE, MONONUCLEAR	1
KIDNEYS	1.87	0.695	LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
SPLEEN	0.42	0.156	OVARIES	MICRO: MINERALIZATION	1
HEART	1.09	0.405	PANCREAS	MICRO: INFILTRATE, LYMPHOCYTE	1
LUNGS	1.37	0.509	THYROID GLANDS	GROSS: SMALL	P
UTERUS/VAGINA	1.88	0.699		LEFT	
THYMUS	0.2880	0.107	^==>	THYROID GLANDS: NO SIGNIFICANT CHANGES OBSERVED	
OVARIES/OVIDUCTS	0.1438	0.053	THYROID GLANDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED	
ADRENAL GLANDS	0.0666	0.025		ONE OF PAIR PRESENT	
THYROIDS/PARATHY	0.0134	0.005	VAGINA	MICRO: NO SIGNIFICANT CHANGES OBSERVED	
FINAL BODY WT(G)	269.			CANNOT STAGE DUE TO MISSING UTERUS	
			CERVIX	GROSS: SWOLLEN	P
			^==>	GROSS UNCONFIRMED	
			CERVIX	MICRO: DILATATION	2
			UTERUS	GROSS: CONTENTS, CLEAR FLUID	P
				BOTH HORNS	
			^==>	GROSS UNCONFIRMED	

NO SIGNIFICANT CHANGES OBSERVED GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYMUS	TRACHEA	URINARY BLADDER	VAGINA
LN, AXILLARY			

ANIMAL NO. 81932 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

				GRADE
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LIVER	LN, MESENTERIC	LUNGS
	MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	PITUITARY
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
	STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	LN, AXILLARY		

NOT PRESENT FOR EXAMINATION

MICRO:	PARATHYROIDS	UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 81966 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT
BRAIN	1.89	0.616	SKELETAL MUSCLE
LIVER	9.75	3.176	THYROID GLANDS
KIDNEYS	1.88	0.612	PARATHYROIDS
SPLEEN	0.54	0.176	
HEART	1.06	0.345	VAGINA
LUNGS	1.19	0.388	
UTERUS/VAGINA	0.78	0.254	NO SIGNIFICANT
THYMUS	0.4101	0.134	CHANGES OBSERVED
OVARIES/OVIDUCTS	0.1244	0.041	
ADRENAL GLANDS	0.0664	0.022	
THYROIDS/PARATHY	0.0210	0.007	
FINAL BODY WT(G)	307.		

		GRADE
GROSS:	NONGRAVID- AMMONIUM SULFIDE NEGATIVE	P
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	CYST, ULTIMOBRANCHIAL	P
MICRO:	NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
MICRO:	NO SIGNIFICANT CHANGES OBSERVED CANNOT STAGE DUE TO MISSING UTERUS	

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	KIDNEYS	LN, MANDIBULAR	LIVER
	LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
	OVIDUCTS	OVARIES	PANCREAS	PITUITARY
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
	STOMACH, NON	SKIN	SPLEEN	PARATHYROIDS
	THYMUS	TRACHEA	URINARY BLADDER	VAGINA
	CERVIX	LN, AXILLARY		

ANIMAL NO. 81966 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

GRADE

NOT PRESENT FOR EXAMINATION

MICRO:UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A91 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81971 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT
BRAIN	2.03	0.722	LN, MANDIBULAR
LIVER	11.24	4.000	THYROID GLANDS
KIDNEYS	2.04	0.726	VAGINA
SPLEEN	0.65	0.231	
HEART	1.07	0.381	NO SIGNIFICANT
LUNGS	1.22	0.434	CHANGES OBSERVED
UTERUS/VAGINA	0.73	0.260	
THYMUS	0.2304	0.082	
OVARIES/OVIDUCTS	0.1757	0.063	
ADRENAL GLANDS	0.0626	0.022	
THYROIDS/PARATHY	0.0179	0.006	
FINAL BODY WT(G)	281.		

			GRADE
GROSS: NONGRAVID- AMMONIUM SULFIDE NEGATIVE			P
MICRO: PLASMACYTOSIS, MEDULLARY			1
MICRO: CYST, ULTIMOBRANCHIAL			P
MICRO: NO SIGNIFICANT CHANGES OBSERVED			
CANNOT STAGE DUE TO MISSING UTERUS			

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	KIDNEYS	LIVER	LN, MESENTERIC
	LUNGS	MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
	SKELETAL MUSCLE	SKIN	SPLEEN	THYMUS
	TRACHEA	URINARY BLADDER	VAGINA	CERVIX
	LN, AXILLARY			

NOT PRESENT FOR EXAMINATION

MICRO: PARATHYROIDS UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81945 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/14/10 DATE OF DEATH: 11/14/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT
BRAIN	1.87	0.714	KIDNEYS
LIVER	10.47	3.996	
KIDNEYS	1.69	0.645	KIDNEYS
SPLEEN	0.50	0.191	LIVER
HEART	0.92	0.351	THYROID GLANDS
LUNGS	1.12	0.427	
UTERUS/VAGINA	1.39	0.531	UTERUS
THYMUS	0.1268	0.048	
OVARIES/OVIDUCTS	0.1401	0.053	NO SIGNIFICANT
ADRENAL GLANDS	0.0725	0.028	CHANGES OBSERVED
THYROIDS/PARATHY	0.0155	0.006	
FINAL BODY WT(G)	262.		

				GRADE
GROSS: NONGRAVID- AMMONIUM SULFIDE NEGATIVE				P
GROSS: AREA(S), WHITE				P
ONE, 5 X 4 MM, IN CORTEX, LEFT				
MICRO: MINERALIZATION				1
MICRO: INFILTRATE, MONONUCLEAR				1
MICRO: HYPERTROPHY, EPITHELIAL				1
VACUOLATION, CYTOPLASMIC				1
GROSS: CONTENTS, CLEAR FLUID				P
BOTH HORNS				
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER	
LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC	
OVIDUCTS	OVARIES	PANCREAS	PITUITARY	
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS	
THYMUS	TRACHEA	URINARY BLADDER	VAGINA	
CERVIX	LN, AXILLARY			
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	HEART	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81947 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/14/10 DATE OF DEATH: 11/14/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.95	0.637
LIVER	13.56	4.431
KIDNEYS	2.28	0.745
SPLEEN	0.61	0.199
HEART	1.19	0.389
LUNGS	1.43	0.467
UTERUS/VAGINA	1.37	0.448
THYMUS	0.3557	0.116
OVARIES/OVIDUCTS	0.1254	0.041
ADRENAL GLANDS	0.0695	0.023
THYROIDS/PARATHY	0.0159	0.005
FINAL BODY WT(G)	306.	

GENERAL COMMENT
THYROID GLANDS
UTERUS

NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
GROSS:	NONGRAVID- AMMONIUM SULFIDE NEGATIVE	P
MICRO:	VACUOLATION, CYTOPLASMIC	1
GROSS:	CONTENTS, CLEAR FLUID BOTH HORNS	P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	KIDNEYS
	LIVER	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81951 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

			GRADE
	GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,9	P
FINAL BODY WT(G) 283.			
	GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 7,9	P
	HEART	MICRO: CARDIOMYOPATHY	1
	LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	1
	LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
		HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
		VACUOLATION, HEPATOCELLULAR, PERIPORTAL	1
	LUNGS	MICRO: MACROPHAGES, ALVEOLAR	1
	MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
	PITUITARY	MICRO: CYST, PARS DISTALIS	P
	SPLEEN	MICRO: HEMATOPOIESIS, EXTRAMEDULLARY, INCREASED	1
	THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
		VACUOLATION, CYTOPLASMIC	1
	THYMUS	MICRO: DEPLETION, LYMPHOID, CORTEX	2
	VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
	UTERUS	MICRO: INVOLUTION	P
	NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE

ANIMAL NO. 81951 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

GRADE

MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
CECUM	COLON	DUODENUM	ESOPHAGUS
EYES	NERVES, OPTIC	ILEUM	JEJUNUM
KIDNEYS	LN, MESENTERIC	NERVE, SCIATIC	OVIDUCTS
OVARIES	PANCREAS	RECTUM	SPINAL CORD
SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE
SKIN	PARATHYROIDS	TRACHEA	URINARY BLADDER
CERVIX	LN, AXILLARY		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A93 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 81924 GROUP 1: SHAM CONTROL FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
BRAIN	1.87	0.603		
LIVER	11.77	3.797	GENERAL COMMENT	
KIDNEYS	2.15	0.694		
SPLEEN	0.62	0.200	THYMUS	
HEART	0.97	0.313		
LUNGS	1.16	0.374	NO SIGNIFICANT	
UTERUS/VAGINA	1.22	0.394	CHANGES OBSERVED	
THYMUS	0.1075	0.035		
OVARIES/OVIDUCTS	0.1373	0.044		
ADRENAL GLANDS	0.0825	0.027		
THYROIDS/PARATHY	0.0128	0.004		
FINAL BODY WT(G)	310.			

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,9 — P

GROSS: CORPORA LUTEA (LEFT,RIGHT) 6,9 — P

GROSS: AREA(S), DARK RED MULTIPLE, IRREGULARLY SHAPED — P

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	TRACHEA	URINARY BLADDER	VAGINA
CERVIX	LN, AXILLARY	UTERUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 81940 GROUP 1: SHAM CONTROL FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.91	0.507
LIVER	13.33	3.536
KIDNEYS	2.42	0.642
SPLEEN	0.67	0.178
HEART	1.14	0.302
LUNGS	1.36	0.361
UTERUS/VAGINA	0.89	0.236
THYMUS	0.2206	0.059
OVARIES/OVIDUCTS	0.1514	0.040
ADRENAL GLANDS	0.0705	0.019
THYROIDS/PARATHY	0.0176	0.005
FINAL BODY WT(G)	377.	

GENERAL COMMENT
NO SIGNIFICANT
CHANGES OBSERVED

	GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)	P
8,9	
GROSS: CORPORA LUTEA (LEFT,RIGHT)	P
8,9	

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
VAGINA	CERVIX	LN, AXILLARY	UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 81944 GROUP 1: SHAM CONTROL FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.93	0.581
LIVER	15.03	4.527
KIDNEYS	2.45	0.738
SPLEEN	0.67	0.202
HEART	1.13	0.340
LUNGS	1.39	0.419
UTERUS/VAGINA	0.88	0.265
THYMUS	0.1271	0.038
OVARIES/OVIDUCTS	0.1402	0.042
ADRENAL GLANDS	0.0749	0.023
THYROIDS/PARATHY	0.0171	0.005
FINAL BODY WT(G)	332.	

GENERAL COMMENT
NO SIGNIFICANT
CHANGES OBSERVED

	GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 5,10	P
GROSS: CORPORA LUTEA (LEFT,RIGHT) 5,10	P

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
VAGINA	CERVIX	LN, AXILLARY	UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 81952 GROUP 1: SHAM CONTROL FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
BRAIN	1.90	0.571		
LIVER	16.19	4.862	GENERAL COMMENT	
KIDNEYS	2.60	0.781		
SPLEEN	0.91	0.273	KIDNEYS	
HEART	1.58	0.474		
LUNGS	1.51	0.453	THYMUS	
UTERUS/VAGINA	1.30	0.390		
THYMUS	0.2139	0.064	NO SIGNIFICANT	
OVARIES/OVIDUCTS	0.1640	0.049	CHANGES OBSERVED	
ADRENAL GLANDS	0.0761	0.023		
THYROIDS/PARATHY	0.0146	0.004		
FINAL BODY WT(G)	333.			

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) P
8,9
GROSS: CORPORA LUTEA (LEFT,RIGHT) P
9,10
GROSS: DILATED PELVIS 2
BILATERAL
GROSS: AREA(S), DARK RED P
MULTIPLE, PINPOINT

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
TRACHEA	URINARY BLADDER	VAGINA	CERVIX
LN, AXILLARY	UTERUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 81963 GROUP 1: SHAM CONTROL FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.97	0.610
LIVER	11.59	3.588
KIDNEYS	2.32	0.718
SPLEEN	0.67	0.207
HEART	1.21	0.375
LUNGS	1.38	0.427
UTERUS/VAGINA	1.04	0.322
THYMUS	0.2587	0.080
OVARIES/OVIDUCTS	0.1748	0.054
ADRENAL GLANDS	0.0756	0.023
THYROIDS/PARATHY	0.0208	0.006
FINAL BODY WT(G)	323.	

GENERAL COMMENT
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) P
5,10

GROSS: CORPORA LUTEA (LEFT,RIGHT) P
10,13

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
VAGINA	CERVIX	LN, AXILLARY	UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 81920 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.672
LIVER	10.51	3.446
KIDNEYS	2.19	0.718
SPLEEN	0.59	0.193
HEART	1.01	0.331
LUNGS	1.30	0.426
UTERUS/VAGINA	0.98	0.321
THYMUS	0.1638	0.054
OVARIES/OVIDUCTS	0.1604	0.053
ADRENAL GLANDS	0.0805	0.026
THYROIDS/PARATHY	0.0193	0.006
FINAL BODY WT(G)	305.	

GENERAL COMMENT
NO SIGNIFICANT CHANGES OBSERVED

				GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,7			P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 6,7			P
HEART	MICRO: CARDIOMYOPATHY			1
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE			1
	MINERALIZATION			1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY			2
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION			3
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL			P
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT			
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL			P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	ILEUM	JEJUNUM
	LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC

ANIMAL NO. 81920 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

GRADE

OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN
PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
CERVIX	LN, AXILLARY	UTERUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81938 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.06	0.630
LIVER	13.95	4.266
KIDNEYS	2.27	0.694
SPLEEN	0.63	0.193
HEART	1.20	0.367
LUNGS	1.56	0.477
UTERUS/VAGINA	1.15	0.352
THYMUS	0.1660	0.051
OVARIES/OVIDUCTS	0.1618	0.049
ADRENAL GLANDS	0.0685	0.021
THYROIDS/PARATHY	0.0148	0.005
FINAL BODY WT(G)	327.	

GENERAL COMMENT
GENERAL COMMENT
LN, MANDIBULAR
LUNGS
MAMMARY GLAND
VAGINA
NO SIGNIFICANT CHANGES OBSERVED

					GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)					P
	10,6				
GROSS: CORPORA LUTEA (LEFT,RIGHT)					P
	10,6				
MICRO: PLASMACYTOSIS, MEDULLARY					2
MICRO: INFILTRATE, EOSINOPHIL, PERIVASCULAR					1
MICRO: HYPERPLASIA, PHYSIOLOGIC					2
	LACTATION				
MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL					P
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE	
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN	
	CECUM	COLON	DUODENUM	ESOPHAGUS	
	EYES	NERVES, OPTIC	HEART	ILEUM	
	JEJUNUM	KIDNEYS	LIVER	LN, MESENTERIC	
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN	
	SPLEEN	THYROID GLANDS	PARATHYROIDS	THYMUS	
	TRACHEA	URINARY BLADDER	CERVIX	LN, AXILLARY	
	UTERUS				

ANIMAL NO. 81938 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81939 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.600
LIVER	11.87	3.768
KIDNEYS	2.08	0.660
SPLEEN	0.59	0.187
HEART	1.04	0.330
LUNGS	1.32	0.419
UTERUS/VAGINA	0.80	0.254
THYMUS	0.1925	0.061
OVARIES/OVIDUCTS	0.1440	0.046
ADRENAL GLANDS	0.0673	0.021
THYROIDS/PARATHY	0.0161	0.005
FINAL BODY WT(G)	315.	

GENERAL COMMENT
NO SIGNIFICANT CHANGES OBSERVED

GENERAL COMMENT
LN, MANDIBULAR
MAMMARY GLAND
PITUITARY
STOMACH, NON
THYROID GLANDS
THYMUS
VAGINA

		GRADE
GROSS:	FORMER IMPLANTATION SITES (LEFT,RIGHT) 7,8	P
GROSS:	CORPORA LUTEA (LEFT,RIGHT) 8,8	P
MICRO:	PLASMACYTOSIS, MEDULLARY	2
MICRO:	HYPERPLASIA, PHYSIOLOGIC LACTATION	2
MICRO:	CYST, PARS INTERMEDIA	P
MICRO:	NO SIGNIFICANT CHANGES OBSERVED LAYER OF BACILLUS SHAPED BACTERIA ON LUMINAL SURFACE	
MICRO:	CYST, ULTIMOBRANCHIAL	P
MICRO:	HEMORRHAGE	2
MICRO:	ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	KIDNEYS	LIVER	LN, MESENTERIC
	LUNGS	NERVE, SCIATIC	OVIDUCTS	OVARIES

ANIMAL NO. 81939 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

				GRADE
PANCREAS	RECTUM	SPINAL CORD	SAL. GLAND MAND	
STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN	
SPLEEN	TRACHEA	URINARY BLADDER	CERVIX	
LN, AXILLARY	UTERUS			

NOT PRESENT FOR EXAMINATION

MICRO:PARATHYROIDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81942 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.76	0.552
LIVER	12.80	4.013
KIDNEYS	1.99	0.624
SPLEEN	0.52	0.163
HEART	1.04	0.326
LUNGS	1.38	0.433
UTERUS/VAGINA	0.87	0.273
THYMUS	0.1995	0.063
OVARIES/OVIDUCTS	0.1288	0.040
ADRENAL GLANDS	0.0726	0.023
THYROIDS/PARATHY	0.0126	0.004
FINAL BODY WT(G)	319.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 9,8	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 10,9	P
KIDNEYS	MICRO: MINERALIZATION	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND

ANIMAL NO. 81942 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

				GRADE
STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN	
SPLEEN	THYROID GLANDS	PARATHYROIDS	THYMUS	
TRACHEA	URINARY BLADDER	CERVIX	LN, AXILLARY	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81950 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.720
LIVER	9.32	3.530
KIDNEYS	1.64	0.621
SPLEEN	0.54	0.205
HEART	0.99	0.375
LUNGS	1.23	0.466
UTERUS/VAGINA	0.81	0.307
THYMUS	0.1146	0.043
OVARIES/OVIDUCTS	0.1156	0.044
ADRENAL GLANDS	0.0592	0.022
THYROIDS/PARATHY	0.0146	0.006
FINAL BODY WT(G)	264.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 4,6	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 5,7	P
CECUM	MICRO: INFILTRATE, NEUTROPHIL	1
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE	1
	MINERALIZATION	2
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	COLON	DUODENUM	ESOPHAGUS	EYES
	NERVES, OPTIC	HEART	ILEUM	JEJUNUM

ANIMAL NO. 81950 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

GRADE

LIVER	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN
PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
CERVIX	LN, AXILLARY		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81958 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.98	0.586
LIVER	13.60	4.024
KIDNEYS	2.13	0.630
SPLEEN	0.57	0.169
HEART	1.20	0.355
LUNGS	1.43	0.423
UTERUS/VAGINA	1.09	0.322
THYMUS	0.1847	0.055
OVARIES/OVIDUCTS	0.1442	0.043
ADRENAL GLANDS	0.0729	0.022
THYROIDS/PARATHY	0.0183	0.005
FINAL BODY WT(G)	338.	

GENERAL COMMENT
NO SIGNIFICANT CHANGES OBSERVED

GENERAL COMMENT
KIDNEYS
LN, MANDIBULAR
LIVER
MAMMARY GLAND
PARATHYROIDS
VAGINA
UTERUS

		GRADE
GROSS:	CORPORA LUTEA (LEFT,RIGHT) 7,10	P
GROSS:	FORMER IMPLANTATION SITES (LEFT,RIGHT) 7,10	P
MICRO:	MINERALIZATION	1
MICRO:	PLASMACYTOSIS, MEDULLARY	2
MICRO:	INFILTRATE, MONONUCLEAR	1
MICRO:	HYPERPLASIA, PHYSIOLOGIC LACTATION	2
MICRO:	NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
MICRO:	ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
MICRO:	INVOLUTION	P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LN, MESENTERIC	LUNGS	NERVE, SCIATIC
	OVIDUCTS	OVARIES	PANCREAS	PITUITARY

ANIMAL NO. 81958 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

				GRADE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	
STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN	
THYROID GLANDS	PARATHYROIDS	THYMUS	TRACHEA	
URINARY BLADDER	CERVIX	LN, AXILLARY		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81967 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT
BRAIN	1.93	0.568	
LIVER	11.22	3.300	GENERAL COMMENT
KIDNEYS	2.12	0.624	
SPLEEN	0.58	0.171	HEART
HEART	1.24	0.365	LN, MANDIBULAR
LUNGS	1.43	0.421	MAMMARY GLAND
UTERUS/VAGINA	1.10	0.324	
THYMUS	0.1897	0.056	VAGINA
OVARIES/OVIDUCTS	0.1453	0.043	UTERUS
ADRENAL GLANDS	0.0880	0.026	NO SIGNIFICANT
THYROIDS/PARATHY	0.0154	0.005	CHANGES OBSERVED
FINAL BODY WT(G)	340.		

				GRADE
GROSS:	FORMER IMPLANTATION SITES (LEFT,RIGHT) 9,9			P
GROSS:	CORPORA LUTEA (LEFT,RIGHT) 9,9			P
MICRO:	CARDIOMYOPATHY			1
MICRO:	PLASMACYTOSIS, MEDULLARY			2
MICRO:	HYPERPLASIA, PHYSIOLOGIC LACTATION			2
MICRO:	ESTROUS CYCLE: ANESTRUS, LACTATIONAL			P
MICRO:	INVOLUTION			P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	ILEUM	JEJUNUM
	KIDNEYS	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
	SPLEEN	THYROID GLANDS	PARATHYROIDS	THYMUS
	TRACHEA	URINARY BLADDER	CERVIX	LN, AXILLARY

ANIMAL NO. 81967 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81975 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.85	0.591
LIVER	11.61	3.709
KIDNEYS	2.14	0.684
SPLEEN	0.56	0.179
HEART	1.16	0.371
LUNGS	1.32	0.422
UTERUS/VAGINA	1.07	0.342
THYMUS	0.1855	0.059
OVARIES/OVIDUCTS	0.1542	0.049
ADRENAL GLANDS	0.0927	0.030
THYROIDS/PARATHY	0.0202	0.006
FINAL BODY WT(G)	313.	

GENERAL COMMENT
NO SIGNIFICANT CHANGES OBSERVED

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,8	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 6,8	P
HEART	MICRO: CARDIOMYOPATHY	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
PANCREAS	MICRO: INFILTRATE, LYMPHOCYTE	1
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	ILEUM	JEJUNUM
	KIDNEYS	LIVER	LN, MESENTERIC	LUNGS

ANIMAL NO. 81975 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

GRADE

NERVE, SCIATIC	OVIDUCTS	OVARIES	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN
STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN
PARATHYROIDS	THYMUS	TRACHEA	URINARY BLADDER
CERVIX	LN, AXILLARY		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81979 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.96	0.660
LIVER	10.76	3.623
KIDNEYS	2.08	0.700
SPLEEN	0.54	0.182
HEART	1.06	0.357
LUNGS	1.64	0.552
UTERUS/VAGINA	1.16	0.391
THYMUS	0.1302	0.044
OVARIES/OVIDUCTS	0.1476	0.050
ADRENAL GLANDS	0.0812	0.027
THYROIDS/PARATHY	0.0136	0.005
FINAL BODY WT(G)	297.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 7,8	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 7,8	P
KIDNEYS	GROSS: AREA(S), DEPRESSED FEW, PINPOINT, IN CORTEX, BILATERAL	P
^==>	KIDNEYS: CYST	
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE	1
	CYST	P
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
	LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
	OVIDUCTS	OVARIES	PANCREAS	PITUITARY
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
	THYMUS	TRACHEA	URINARY BLADDER	VAGINA
	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LIVER	LN, MESENTERIC	LUNGS
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS

ANIMAL NO. 81979 GROUP 2: 0 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

GRADE

PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
SPLEEN	THYROID GLANDS	PARATHYROIDS	THYMUS
TRACHEA	URINARY BLADDER	CERVIX	LN, AXILLARY

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 81915 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.99	0.556
LIVER	13.18	3.682
KIDNEYS	2.40	0.670
SPLEEN	0.59	0.165
HEART	1.16	0.324
LUNGS	1.32	0.369
UTERUS/VAGINA	0.92	0.257
THYMUS	0.2597	0.073
OVARIES/OVIDUCTS	0.1495	0.042
ADRENAL GLANDS	0.0645	0.018
THYROIDS/PARATHY	0.0160	0.004
FINAL BODY WT(G)	358.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 7,8	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 8,8	P
HEART	MICRO: CARDIOMYOPATHY	1
KIDNEYS	MICRO: MINERALIZATION	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
VAGINA	CERVIX	LN, AXILLARY	UTERUS

MICRO:

ADRENAL CORTEX	ADRENAL MEDULLA	LIVER	THYROID GLANDS
THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81916 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.92	0.681
LIVER	11.23	3.982
KIDNEYS	2.03	0.720
SPLEEN	0.58	0.206
HEART	1.10	0.390
LUNGS	1.30	0.461
UTERUS/VAGINA	0.78	0.277
THYMUS	0.1800	0.064
OVARIES/OVIDUCTS	0.1391	0.049
ADRENAL GLANDS	0.0756	0.027
THYROIDS/PARATHY	0.0193	0.007
FINAL BODY WT(G)	282.	

GENERAL COMMENT
KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

GENERAL COMMENT
KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

				GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)				
	5,8			P
GROSS: CORPORA LUTEA (LEFT,RIGHT)				
	5,8			P
MICRO: MINERALIZATION				1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER
	THYROID GLANDS	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81917 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.88	0.671
LIVER	11.95	4.268
KIDNEYS	1.96	0.700
SPLEEN	0.53	0.189
HEART	0.96	0.343
LUNGS	1.08	0.386
UTERUS/VAGINA	0.99	0.354
THYMUS	0.0980	0.035
OVARIES/OVIDUCTS	0.1221	0.044
ADRENAL GLANDS	0.0658	0.024
THYROIDS/PARATHY	0.0151	0.005
FINAL BODY WT(G)	280.	

GENERAL COMMENT
GENERAL COMMENT
KIDNEYS
THYROID GLANDS
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 5,9					P
GROSS: CORPORA LUTEA (LEFT,RIGHT) 6,9					P
MICRO: MINERALIZATION					1
MICRO: CYST, ULTIMOBRANCHIAL					P
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER	
	THYMUS				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81921 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.00	0.656
LIVER	12.09	3.964
KIDNEYS	2.05	0.672
SPLEEN	0.68	0.223
HEART	1.13	0.370
LUNGS	1.21	0.397
UTERUS/VAGINA	0.84	0.275
THYMUS	0.1880	0.062
OVARIES/OVIDUCTS	0.1370	0.045
ADRENAL GLANDS	0.0776	0.025
THYROIDS/PARATHY	0.0151	0.005
FINAL BODY WT(G)	305.	

GENERAL COMMENT
GENERAL COMMENT
GENERAL COMMENT
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)					P
	5,8				
GROSS: CORPORA LUTEA (LEFT,RIGHT)					P
	5,8				
GROSS: ORGAN DAMAGED AT NECROPSY					P
	UTERUS				
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	KIDNEYS	
	LIVER	THYROID GLANDS	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81926 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.91	0.659
LIVER	13.24	4.566
KIDNEYS	1.99	0.686
SPLEEN	0.72	0.248
HEART	0.98	0.338
LUNGS	1.24	0.428
UTERUS/VAGINA	0.76	0.262
THYMUS	0.1009	0.035
OVARIES/OVIDUCTS	0.1336	0.046
ADRENAL GLANDS	0.0699	0.024
THYROIDS/PARATHY	0.0149	0.005
FINAL BODY WT(G)	290.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 5,7	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 5,7	P
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, FEMUR, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES, NERVES, OPTIC, HEART, ILEUM, JEJUNUM, KIDNEYS, LN, MANDIBULAR, LIVER, LN, MESENTERIC, LUNGS, MAMMARY GLAND, NERVE, SCIATIC, OVIDUCTS, OVARIES, PANCREAS, PITUITARY, RECTUM, SPINAL CORD, SAL. GLAND MAND, STOMACH, SKELETAL MUSCLE, SKIN, SPLEEN, THYROID GLANDS, THYMUS, TRACHEA, URINARY BLADDER, VAGINA, CERVIX, LN, AXILLARY, UTERUS

MICRO: ADRENAL CORTEX, ADRENAL MEDULLA, HEART, KIDNEYS, THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81930 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
BRAIN	1.95	0.704		
LIVER	11.31	4.083	GENERAL COMMENT	
KIDNEYS	1.92	0.693		
SPLEEN	0.49	0.177	HEART	
HEART	0.90	0.325	KIDNEYS	
LUNGS	1.05	0.379		
UTERUS/VAGINA	0.82	0.296	^==>	
THYMUS	0.1918	0.069	KIDNEYS	
OVARIES/OVIDUCTS	0.1190	0.043		
ADRENAL GLANDS	0.0817	0.029	THYROID GLANDS	
THYROIDS/PARATHY	0.0208	0.008	NO SIGNIFICANT	
FINAL BODY WT(G)	277.		CHANGES OBSERVED	

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) P
5,7
GROSS: CORPORA LUTEA (LEFT,RIGHT) P
5,8
MICRO: CARDIOMYOPATHY 1
GROSS: AREA(S), DEPRESSED P
FEW, PINPOINT TO 1 MM IN DIAMETER, IN CORTEX, BILATERAL
KIDNEYS: NEPHROPATHY, CHRONIC PROGRESSIVE
MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE 1
MINERALIZATION 1
MICRO: CYST, ULTIMOBRANCHIAL P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
	LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
	OVIDUCTS	OVARIES	PANCREAS	PITUITARY
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
	THYMUS	TRACHEA	URINARY BLADDER	VAGINA
	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	LIVER	THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 81941 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.97	0.727
LIVER	10.67	3.937
KIDNEYS	1.99	0.734
SPLEEN	0.44	0.162
HEART	1.02	0.376
LUNGS	1.18	0.435
UTERUS/VAGINA	0.85	0.314
THYMUS	0.1142	0.042
OVARIES/OVIDUCTS	0.1403	0.052
ADRENAL GLANDS	0.0676	0.025
THYROIDS/PARATHY	0.0168	0.006
FINAL BODY WT(G)	271.	

GENERAL COMMENT
NO SIGNIFICANT
CHANGES OBSERVED

GENERAL COMMENT
THYROID GLANDS

				GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)				
	5,8			P
GROSS: CORPORA LUTEA (LEFT,RIGHT)				
	5,8			P
MICRO: CYST, ULTIMOBRANCHIAL				P
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	KIDNEYS
	LIVER	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81960 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.01	0.750
LIVER	10.43	3.892
KIDNEYS	2.09	0.780
SPLEEN	0.44	0.164
HEART	1.05	0.392
LUNGS	1.28	0.478
UTERUS/VAGINA	0.99	0.369
THYMUS	0.0777	0.029
OVARIES/OVIDUCTS	0.1498	0.056
ADRENAL GLANDS	0.0742	0.028
THYROIDS/PARATHY	0.0120	0.004
FINAL BODY WT(G)	268.	

			GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)		P
	7,8		
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT)		P
	8,8		
KIDNEYS	MICRO: MINERALIZATION		1
LIVER	GROSS: AREA(S), DARK RED		P
	ONE, IRREGULARLY SHAPED, LEFT LOBE		
^==>	GROSS UNCONFIRMED		
LIVER	MICRO: VACUOLATION, HEPATOCELLULAR, PERIPORTAL		1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL		1
	VACUOLATION, CYTOPLASMIC		1
THYMUS	GROSS: SMALL		P
^==>	THYMUS: DEPLETION, LYMPHOID, CORTEX		
THYMUS	MICRO: DEPLETION, LYMPHOID, CORTEX		1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
	OVIDUCTS	OVARIES	PANCREAS	PITUITARY
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
	TRACHEA	URINARY BLADDER	VAGINA	CERVIX
	LN, AXILLARY	UTERUS		
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 81961 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.06	0.592
LIVER	13.79	3.963
KIDNEYS	2.22	0.638
SPLEEN	0.51	0.147
HEART	1.24	0.356
LUNGS	1.41	0.405
UTERUS/VAGINA	0.81	0.233
THYMUS	0.1693	0.049
OVARIES/OVIDUCTS	0.1349	0.039
ADRENAL GLANDS	0.0914	0.026
THYROIDS/PARATHY	0.0170	0.005
FINAL BODY WT(G)	348.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,8	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 6,8	P
KIDNEYS	MICRO: MINERALIZATION	1
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
VAGINA	CERVIX	LN, AXILLARY	UTERUS

MICRO:

ADRENAL CORTEX	ADRENAL MEDULLA	HEART	THYROID GLANDS
THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81962 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.97	0.663
LIVER	11.64	3.919
KIDNEYS	2.18	0.734
SPLEEN	0.57	0.192
HEART	1.07	0.360
LUNGS	1.34	0.451
UTERUS/VAGINA	0.81	0.273
THYMUS	0.0990	0.033
OVARIES/OVIDUCTS	0.1337	0.045
ADRENAL GLANDS	0.0648	0.022
THYROIDS/PARATHY	0.0165	0.006
FINAL BODY WT(G)	297.	

GENERAL COMMENT
LIVER
NO SIGNIFICANT
CHANGES OBSERVED

GENERAL COMMENT
LIVER

		GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)	2,13	P
GROSS: CORPORA LUTEA (LEFT,RIGHT)	2,13	P
MICRO: INFILTRATE, MONONUCLEAR		1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	KIDNEYS
	THYROID GLANDS	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81972 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.95	0.657
LIVER	11.96	4.027
KIDNEYS	2.11	0.710
SPLEEN	0.73	0.246
HEART	1.16	0.391
LUNGS	1.21	0.407
UTERUS/VAGINA	0.90	0.303
THYMUS	0.2805	0.094
OVARIES/OVIDUCTS	0.1573	0.053
ADRENAL GLANDS	0.0766	0.026
THYROIDS/PARATHY	0.0167	0.006
FINAL BODY WT(G)	297.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,7	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 6,7	P
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
VAGINA	CERVIX	LN, AXILLARY	UTERUS

MICRO:

ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER
THYROID GLANDS	THYMUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81978 GROUP 3: 100 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.08	0.625
LIVER	13.37	4.015
KIDNEYS	2.33	0.700
SPLEEN	0.60	0.180
HEART	1.20	0.360
LUNGS	1.47	0.441
UTERUS/VAGINA	0.85	0.255
THYMUS	0.1753	0.053
OVARIES/OVIDUCTS	0.1792	0.054
ADRENAL GLANDS	0.1031	0.031
THYROIDS/PARATHY	0.0182	0.005
FINAL BODY WT(G)	333.	

GENERAL COMMENT
GENERAL COMMENT
HEART
THYROID GLANDS
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)					
	8,6				P
GROSS: CORPORA LUTEA (LEFT,RIGHT)					
	9,6				P
MICRO: CARDIOMYOPATHY					1
MICRO: HYPERTROPHY, EPITHELIAL					1
VACUOLATION, CYTOPLASMIC					1
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR		
BRAIN	CECUM	COLON	DUODENUM		
ESOPHAGUS	EYES	NERVES, OPTIC	HEART		
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR		
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND		
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS		
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND		
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN		
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER		
VAGINA	CERVIX	LN, AXILLARY	UTERUS		
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	KIDNEYS	LIVER		
THYMUS					

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81914 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/13/10 DATE OF DEATH: 11/13/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
BRAIN	1.95	0.646		
LIVER	14.85	4.917	GENERAL COMMENT	
KIDNEYS	2.31	0.765		
SPLEEN	0.52	0.172	KIDNEYS	
HEART	1.07	0.354	LN, MANDIBULAR	
LUNGS	1.23	0.407		
UTERUS/VAGINA	1.08	0.358	NO SIGNIFICANT	
THYMUS	0.1241	0.041	CHANGES OBSERVED	
OVARIES/OVIDUCTS	0.1472	0.049		
ADRENAL GLANDS	0.0803	0.027		
THYROIDS/PARATHY	0.0235	0.008		
FINAL BODY WT(G)	302.			

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)				P
4,11				
GROSS: CORPORA LUTEA (LEFT,RIGHT)				P
4,11				
MICRO: MINERALIZATION				1
GROSS: ENLARGED				P
BILATERAL				
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
ILEUM	JEJUNUM	KIDNEYS	LIVER	
LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC	
OVIDUCTS	OVARIES	PANCREAS	PITUITARY	
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH	
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS	
THYMUS	TRACHEA	URINARY BLADDER	VAGINA	
CERVIX	LN, AXILLARY	UTERUS		
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER	
THYROID GLANDS	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81931 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.93	0.737
LIVER	11.62	4.435
KIDNEYS	1.71	0.653
SPLEEN	0.56	0.214
HEART	0.89	0.340
LUNGS	0.98	0.374
UTERUS/VAGINA	0.72	0.275
THYMUS	0.1361	0.052
OVARIES/OVIDUCTS	0.1179	0.045
ADRENAL GLANDS	0.0675	0.026
THYROIDS/PARATHY	0.0142	0.005
FINAL BODY WT(G)	262.	

GENERAL COMMENT
KIDNEYS
GENERAL COMMENT
LIVER
NO SIGNIFICANT
CHANGES OBSERVED

				GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)				P
9,5				
GROSS: CORPORA LUTEA (LEFT,RIGHT)				P
11,8				
MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE				1
MINERALIZATION				1
MICRO: INFILTRATE, MONONUCLEAR				1
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	HEART	THYROID GLANDS	
THYMUS				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81934 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
BRAIN	2.00	0.633		
LIVER	14.68	4.646	GENERAL COMMENT	
KIDNEYS	2.27	0.718		
SPLEEN	0.61	0.193	GENERAL COMMENT	
HEART	1.18	0.373		
UTERUS/VAGINA	0.87	0.275	HEART	
THYMUS	0.1509	0.048	KIDNEYS	
OVARIES/OVIDUCTS	0.1507	0.048	THYROID GLANDS	
ADRENAL GLANDS	0.0769	0.024	NO SIGNIFICANT	
THYROIDS/PARATHY	0.0198	0.006	CHANGES OBSERVED	
FINAL BODY WT(G)	316.			

					GRADE
GROSS:	FORMER IMPLANTATION SITES (LEFT,RIGHT)				P
	6,7				
GROSS:	CORPORA LUTEA (LEFT,RIGHT)				P
	7,9				
GROSS:	ORGAN WEIGHT				P
	LUNGS INFLATED WITH FIXATIVE PRIOR TO WEIGHING: 3.78 G				
MICRO:	CARDIOMYOPATHY				1
MICRO:	MINERALIZATION				1
MICRO:	CYST, ULTIMOBRANCHIAL				P
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	LIVER	THYMUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81943 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
BRAIN	1.98	0.667		
LIVER	14.43	4.859	GENERAL COMMENT	
KIDNEYS	1.93	0.650		
SPLEEN	0.54	0.182	KIDNEYS	
HEART	1.04	0.350	THYROID GLANDS	
LUNGS	1.30	0.438		
UTERUS/VAGINA	0.81	0.273	NO SIGNIFICANT	
THYMUS	0.1438	0.048	CHANGES OBSERVED	
OVARIES/OVIDUCTS	0.1381	0.046		
ADRENAL GLANDS	0.0740	0.025		
THYROIDS/PARATHY	0.0146	0.005		
FINAL BODY WT(G)	297.			

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)				P
3,9				
GROSS: CORPORA LUTEA (LEFT,RIGHT)				P
4,10				
MICRO: MINERALIZATION				2
MICRO: HYPERTROPHY, EPITHELIAL				1
VACUOLATION, CYTOPLASMIC				1
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER	
THYMUS				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81946 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.85	0.720
LIVER	11.63	4.525
KIDNEYS	1.77	0.689
SPLEEN	0.42	0.163
HEART	0.92	0.358
LUNGS	1.04	0.405
UTERUS/VAGINA	0.74	0.288
THYMUS	0.0872	0.034
OVARIES/OVIDUCTS	0.1378	0.054
ADRENAL GLANDS	0.0658	0.026
THYROIDS/PARATHY	0.0124	0.005
FINAL BODY WT(G)	257.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 5,8	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 5,8	P
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	KIDNEYS
	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81957 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/06/10 DATE OF DEATH: 11/06/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.06	0.749
LIVER	11.65	4.236
KIDNEYS	1.81	0.658
SPLEEN	0.53	0.193
HEART	1.02	0.371
LUNGS	1.17	0.425
UTERUS/VAGINA	0.92	0.335
THYMUS	0.1008	0.037
OVARIES/OVIDUCTS	0.1258	0.046
ADRENAL GLANDS	0.0695	0.025
THYROIDS/PARATHY	0.0164	0.006
FINAL BODY WT(G)	275.	

GENERAL COMMENT
KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

GENERAL COMMENT
KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)					
	6,5				P
GROSS: CORPORA LUTEA (LEFT,RIGHT)					
	6,5				P
MICRO: MINERALIZATION					
					1
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER	
	THYROID GLANDS	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81959 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.12	0.686
LIVER	12.14	3.929
KIDNEYS	2.25	0.728
SPLEEN	0.51	0.165
HEART	1.15	0.372
LUNGS	1.23	0.398
UTERUS/VAGINA	0.95	0.307
THYMUS	0.1457	0.047
OVARIES/OVIDUCTS	0.1633	0.053
ADRENAL GLANDS	0.0932	0.030
THYROIDS/PARATHY	0.0166	0.005
FINAL BODY WT(G)	309.	

GENERAL COMMENT
NO SIGNIFICANT
CHANGES OBSERVED

THYROID GLANDS

GENERAL COMMENT

					GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 5,9					P
GROSS: CORPORA LUTEA (LEFT,RIGHT) 5,9					P
MICRO: ECTOPIC THYMUS					P
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
	BRAIN	CECUM	COLON	DUODENUM	
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	KIDNEYS	
	LIVER	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81974 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.682
LIVER	13.24	4.780
KIDNEYS	1.96	0.708
SPLEEN	0.95	0.343
HEART	1.21	0.437
LUNGS	1.30	0.469
UTERUS/VAGINA	0.91	0.329
THYMUS	0.1580	0.057
OVARIES/OVIDUCTS	0.1575	0.057
ADRENAL GLANDS	0.0771	0.028
THYROIDS/PARATHY	0.0203	0.007
FINAL BODY WT(G)	277.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 5,7	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 5,8	P
HEART	MICRO: CARDIOMYOPATHY	1
KIDNEYS	MICRO: MINERALIZATION	1
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	THYROID GLANDS	THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81976 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/06/10 DATE OF DEATH: 11/06/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.87	0.613
LIVER	14.11	4.626
KIDNEYS	2.03	0.666
SPLEEN	0.55	0.180
HEART	1.05	0.344
LUNGS	1.27	0.416
UTERUS/VAGINA	0.77	0.252
THYMUS	0.1539	0.050
OVARIES/OVIDUCTS	0.1473	0.048
ADRENAL GLANDS	0.0631	0.021
THYROIDS/PARATHY	0.0142	0.005
FINAL BODY WT(G)	305.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 4,9	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 11,10	P
KIDNEYS	MICRO: MINERALIZATION	1
LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	THYMUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81977 GROUP 4: 300 MG/KG FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.95	0.596
LIVER	15.07	4.609
KIDNEYS	2.44	0.746
SPLEEN	0.68	0.208
HEART	1.17	0.358
LUNGS	1.32	0.404
UTERUS/VAGINA	0.98	0.300
THYMUS	0.1885	0.058
OVARIES/OVIDUCTS	0.1589	0.049
ADRENAL GLANDS	0.0762	0.023
THYROIDS/PARATHY	0.0149	0.005
FINAL BODY WT(G)	327.	

			GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)		
	4,9		P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT)		
	6,9		P
KIDNEYS	GROSS: AREA(S), DEPRESSED		
	FEW, 1 MM IN DIAMETER, IN CORTEX, LEFT		P
^==>	KIDNEYS: NEPHROPATHY, CHRONIC PROGRESSIVE		
KIDNEYS	MICRO: NEPHROPATHY, CHRONIC PROGRESSIVE		1
	MINERALIZATION		1
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL		P
	HYPERTROPHY, EPITHELIAL		1
	VACUOLATION, CYTOPLASMIC		1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
	LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
	OVIDUCTS	OVARIES	PANCREAS	PITUITARY
	RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
	SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
	THYMUS	TRACHEA	URINARY BLADDER	VAGINA
	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	HEART	LIVER
	THYMUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 81918 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

ORGAN WEIGHT	ABS.(G)	REL.			GRADE
BRAIN	2.12	0.644	GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,10	P
LIVER	21.75	6.611	GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 8,10	P
KIDNEYS	2.53	0.769	ADRENAL CORTEX	MICRO: VACUOLATION, CYTOPLASMIC	(1)
SPLEEN	0.63	0.191	NERVES, OPTIC	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
HEART	1.22	0.371	KIDNEYS	MICRO: MINERALIZATION	2
LUNGS	1.26	0.383		NEPHROPATHY, CHRONIC PROGRESSIVE	1
UTERUS/VAGINA	1.08	0.328		INFILTRATE, MONONUCLEAR	2
THYMUS	0.1239	0.038	LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
OVARIES/OVIDUCTS	0.1287	0.039	LIVER	MICRO: INFILTRATE, MONONUCLEAR	1
ADRENAL GLANDS	0.0934	0.028		HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
THYROIDS/PARATHY	0.0168	0.005	MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
FINAL BODY WT(G)	329.		SKIN	MICRO: HYPERPLASIA, EPITHELIAL	(1)
			THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
				HYPERTROPHY, EPITHELIAL	1
				VACUOLATION, CYTOPLASMIC	1
			THYMUS	MICRO: DEPLETION, LYMPHOID, CORTEX	1
			VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
			UTERUS	MICRO: INVOLUTION	P
			NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND

ANIMAL NO. 81918 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

					GRADE
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL MEDULLA	AORTA	STERNEBRAE	MARROW, STERN	
	FEMUR	MARROW, FEMUR	BRAIN	CECUM	
	COLON	DUODENUM	ESOPHAGUS	EYES	
	NERVES, OPTIC	HEART	ILEUM	JEJUNUM	
	LN, MESENTERIC	LUNGS	NERVE, SCIATIC	OVIDUCTS	
	OVARIES	PANCREAS	PITUITARY	RECTUM	
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	
	SKELETAL MUSCLE	SPLEEN	TRACHEA	URINARY BLADDER	
	CERVIX	LN, AXILLARY			

NOT PRESENT FOR EXAMINATION

MICRO:PARATHYROIDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
( )-FOCAL/SOLITARY, (( ))-MULTIFOCAL/MULTIPLE, NO PARENTHESES-NOT SPECIFIED

ANIMAL NO. 81919 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.704
LIVER	15.76	5.837
KIDNEYS	1.97	0.730
SPLEEN	0.45	0.167
HEART	0.88	0.326
LUNGS	1.13	0.419
UTERUS/VAGINA	0.70	0.259
THYMUS	0.1256	0.047
OVARIES/OVIDUCTS	0.1152	0.043
ADRENAL GLANDS	0.0844	0.031
THYROIDS/PARATHY	0.0184	0.007
FINAL BODY WT(G)	270.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 3,7	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 4,7	P
KIDNEYS	MICRO: MINERALIZATION	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	1
LIVER	MICRO: HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
	VACUOLATION, HEPATOCELLULAR, PERIPORTAL	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LN, MESENTERIC	LUNGS	NERVE, SCIATIC

ANIMAL NO. 81919 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/05/10 DATE OF DEATH: 11/05/10

				GRADE
OVIDUCTS	OVARIES	PANCREAS	PITUITARY	
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	
STOMACH, NON	SKELETAL MUSCLE	SKIN	SPLEEN	
THYMUS	TRACHEA	URINARY BLADDER	CERVIX	
LN, AXILLARY				

NOT PRESENT FOR EXAMINATION
MICRO:PARATHYROIDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81927 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/15/10 DATE OF DEATH: 11/15/10

ORGAN WEIGHT	ABS.(G)	REL.			GRADE
BRAIN	1.86	0.684	GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 4,6	P
LIVER	16.22	5.963	GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 4,7	P
KIDNEYS	1.98	0.728	GENERAL COMMENT	GROSS: ORGAN DAMAGED AT NECROPSY UTERUS, RIGHT HORN	P
SPLEEN	0.45	0.165	NERVES, OPTIC	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
HEART	0.90	0.331	KIDNEYS	MICRO: MINERALIZATION	1
LUNGS	1.15	0.423		DILATATION, TUBULAR	1
UTERUS/VAGINA	0.77	0.283	LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
THYMUS	0.0693	0.025	LIVER	MICRO: HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
OVARIES/OVIDUCTS	0.1031	0.038	LUNGS	MICRO: MACROPHAGES, ALVEOLAR	1
ADRENAL GLANDS	0.0649	0.024	MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
THYROIDS/PARATHY	0.0156	0.006	THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
FINAL BODY WT(G)	272.			HYPERTROPHY, EPITHELIAL	1
				VACUOLATION, CYTOPLASMIC	1
			PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
			VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
			UTERUS	MICRO: INVOLUTION	P
			NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS

ANIMAL NO. 81927 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/15/10 DATE OF DEATH: 11/15/10

GRADE

	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LN, MESENTERIC	NERVE, SCIATIC	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	RECTUM
	SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
	SKELETAL MUSCLE	SKIN	SPLEEN	PARATHYROIDS
	THYMUS	TRACHEA	URINARY BLADDER	CERVIX
	LN, AXILLARY			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81936 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.711
LIVER	15.56	5.850
KIDNEYS	2.05	0.771
SPLEEN	0.52	0.195
HEART	0.91	0.342
LUNGS	1.19	0.447
UTERUS/VAGINA	0.91	0.342
THYMUS	0.0814	0.031
OVARIES/OVIDUCTS	0.1275	0.048
ADRENAL GLANDS	0.0708	0.027
THYROIDS/PARATHY	0.0162	0.006
FINAL BODY WT(G)	266.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 8,6	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 8,6	P
HEART	MICRO: CARDIOMYOPATHY	1
KIDNEYS	MICRO: MINERALIZATION	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
LIVER	MICRO: HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
THYMUS	MICRO: DEPLETION, LYMPHOID, CORTEX	2
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
VAGINA	CERVIX	LN, AXILLARY	UTERUS

MICRO:

ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
CECUM	COLON	DUODENUM	ESOPHAGUS

ANIMAL NO. 81936 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

GRADE

EYES	NERVES, OPTIC	ILEUM	JEJUNUM
LN, MESENTERIC	LUNGS	NERVE, SCIATIC	OVIDUCTS
OVARIES	PANCREAS	PITUITARY	RECTUM
SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
SKELETAL MUSCLE	SKIN	SPLEEN	PARATHYROIDS
TRACHEA	URINARY BLADDER	CERVIX	LN, AXILLARY
UTERUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81937 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.610
LIVER	20.02	6.458
KIDNEYS	2.13	0.687
SPLEEN	0.59	0.190
HEART	1.09	0.352
LUNGS	1.28	0.413
UTERUS/VAGINA	0.82	0.265
THYMUS	0.2071	0.067
OVARIES/OVIDUCTS	0.1725	0.056
ADRENAL GLANDS	0.0634	0.020
THYROIDS/PARATHY	0.0220	0.007
FINAL BODY WT(G)	310.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 0,2	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 7,5	P
HEART	MICRO: CARDIOMYOPATHY	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	1
LIVER	MICRO: VACUOLATION, HEPATOCELLULAR, PERIPORTAL	1
	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
LN, MESENTERIC	MICRO: PLASMACYTOSIS, MEDULLARY	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
THYROID GLANDS	MICRO: CYST, ULTIMOBRANCHIAL	P
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS

ANIMAL NO. 81937 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

GRADE

EYES	NERVES, OPTIC	ILEUM	JEJUNUM
KIDNEYS	LUNGS	NERVE, SCIATIC	OVIDUCTS
OVARIES	PANCREAS	PITUITARY	RECTUM
SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
SKELETAL MUSCLE	SKIN	SPLEEN	PARATHYROIDS
THYMUS	TRACHEA	URINARY BLADDER	CERVIX
LN, AXILLARY			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81955 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.712
LIVER	16.38	6.135
KIDNEYS	2.06	0.772
SPLEEN	0.50	0.187
HEART	0.92	0.345
LUNGS	1.11	0.416
UTERUS/VAGINA	0.86	0.322
THYMUS	0.1493	0.056
OVARIES/OVIDUCTS	0.1338	0.050
ADRENAL GLANDS	0.0851	0.032
THYROIDS/PARATHY	0.0210	0.008
FINAL BODY WT(G)	267.	

GENERAL COMMENT
KIDNEYS
LN, MANDIBULAR
LIVER
LN, MESENTERIC
MAMMARY GLAND
THYROID GLANDS
THYMUS
VAGINA
NO SIGNIFICANT CHANGES OBSERVED

		GRADE
GROSS:	FORMER IMPLANTATION SITES (LEFT,RIGHT) 6,6	P
GROSS:	CORPORA LUTEA (LEFT,RIGHT) 7,6	P
MICRO:	MINERALIZATION	1
MICRO:	PLASMACYTOSIS, MEDULLARY	2
MICRO:	HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
MICRO:	PLASMACYTOSIS, MEDULLARY	1
MICRO:	HYPERPLASIA, PHYSIOLOGIC LACTATION	2
MICRO:	HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
MICRO:	DEPLETION, LYMPHOID, CORTEX	1
MICRO:	ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS
	EYES	NERVES, OPTIC	HEART	ILEUM
	JEJUNUM	LUNGS	NERVE, SCIATIC	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	RECTUM

ANIMAL NO. 81955 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

GRADE

SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
SKELETAL MUSCLE	SKIN	SPLEEN	PARATHYROIDS
TRACHEA	URINARY BLADDER	CERVIX	LN, AXILLARY
UTERUS			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81968 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.94	0.676
LIVER	18.59	6.477
KIDNEYS	2.47	0.861
SPLEEN	0.49	0.171
HEART	0.96	0.334
LUNGS	1.16	0.404
UTERUS/VAGINA	0.73	0.254
THYMUS	0.1247	0.043
OVARIES/OVIDUCTS	0.1339	0.047
ADRENAL GLANDS	0.0971	0.034
THYROIDS/PARATHY	0.0194	0.007
FINAL BODY WT(G)	287.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 7,5	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 7,5	P
ADRENAL CORTEX	MICRO: VACUOLATION, CYTOPLASMIC	2
KIDNEYS	MICRO: MINERALIZATION	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
LIVER	MICRO: HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
	INFILTRATE, MONONUCLEAR	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
SPLEEN	MICRO: HEMATOPOIESIS, EXTRAMEDULLARY, INCREASED	1
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
THYMUS	MICRO: DEPLETION, LYMPHOID, CORTEX	1
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL MEDULLA	AORTA	STERNEBRAE	MARROW, STERN
	FEMUR	MARROW, FEMUR	BRAIN	CECUM

ANIMAL NO. 81968 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/04/10 DATE OF DEATH: 11/04/10

GRADE

COLON	DUODENUM	ESOPHAGUS	EYES
NERVES, OPTIC	HEART	ILEUM	JEJUNUM
LN, MESENTERIC	LUNGS	NERVE, SCIATIC	OVIDUCTS
OVARIES	PANCREAS	PITUITARY	RECTUM
SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
SKELETAL MUSCLE	SKIN	THYROID GLANDS	PARATHYROIDS
TRACHEA	URINARY BLADDER	CERVIX	LN, AXILLARY

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81969 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
BRAIN	1.85	0.609		
LIVER	19.74	6.493	GENERAL COMMENT	
KIDNEYS	2.17	0.714		
SPLEEN	0.65	0.214	LN, MANDIBULAR	
HEART	1.05	0.345	LIVER	
LUNGS	1.26	0.414		
UTERUS/VAGINA	0.77	0.253		
THYMUS	0.0649	0.021	MAMMARY GLAND	
OVARIES/OVIDUCTS	0.1297	0.043		
ADRENAL GLANDS	0.0862	0.028	THYROID GLANDS	
THYROIDS/PARATHY	0.0191	0.006		
FINAL BODY WT(G)	304.		THYMUS	
			VAGINA	
			UTERUS	
			NO SIGNIFICANT CHANGES OBSERVED	

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT)				P
7,7				
GROSS: CORPORA LUTEA (LEFT,RIGHT)				P
7,7				
MICRO: PLASMACYTOSIS, MEDULLARY				2
MICRO: NECROSIS, COAGULATIVE				1
MULTIFOCAL, RANDOM WITH SUBACUTE INFLAMMATION				
HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR				1
MICRO: HYPERPLASIA, PHYSIOLOGIC				2
LACTATION				
MICRO: HYPERTROPHY, EPITHELIAL				2
VACUOLATION, CYTOPLASMIC				1
MICRO: DEPLETION, LYMPHOID, CORTEX				1
MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL				P
MICRO: INVOLUTION				P
GROSS: ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR	
BRAIN	CECUM	COLON	DUODENUM	
ESOPHAGUS	EYES	NERVES, OPTIC	HEART	
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR	
LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
VAGINA	CERVIX	LN, AXILLARY	UTERUS	
MICRO: ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE	
MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN	
CECUM	COLON	DUODENUM	ESOPHAGUS	
EYES	NERVES, OPTIC	HEART	ILEUM	

ANIMAL NO. 81969 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

GRADE

JEJUNUM	KIDNEYS	LN, MESENTERIC	LUNGS
NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE	SKIN
SPLEEN	PARATHYROIDS	TRACHEA	URINARY BLADDER
CERVIX	LN, AXILLARY		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81973 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.98	0.739
LIVER	14.99	5.593
KIDNEYS	2.17	0.810
SPLEEN	0.58	0.216
HEART	0.92	0.343
LUNGS	1.17	0.437
UTERUS/VAGINA	0.92	0.343
THYMUS	0.0769	0.029
OVARIES/OVIDUCTS	0.1431	0.053
ADRENAL GLANDS	0.0716	0.027
THYROIDS/PARATHY	0.0165	0.006
FINAL BODY WT(G)	268.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 3,9	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 3,12	P
HEART	MICRO: CARDIOMYOPATHY	1
KIDNEYS	MICRO: MINERALIZATION	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
LIVER	MICRO: HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
	INFILTRATE, MONONUCLEAR	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	2
	VACUOLATION, CYTOPLASMIC	1
THYMUS	GROSS: SMALL	P
^==> GROSS	UNCONFIRMED	
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	TRACHEA	URINARY BLADDER	VAGINA
	CERVIX	LN, AXILLARY	UTERUS	
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	ESOPHAGUS

ANIMAL NO. 81973 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

GRADE

EYES	ILEUM	JEJUNUM	LN, MESENTERIC
LUNGS	NERVE, SCIATIC	OVIDUCTS	OVARIES
PANCREAS	PITUITARY	RECTUM	SPINAL CORD
SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON	SKELETAL MUSCLE
SKIN	SPLEEN	THYMUS	TRACHEA
URINARY BLADDER	CERVIX	LN, AXILLARY	

NOT PRESENT FOR EXAMINATION

MICRO:NERVES, OPTIC PARATHYROIDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT
^==> INDICATES MICRO CONFIRMATION OF ABOVE GROSS FINDING

ANIMAL NO. 81980 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/06/10 DATE OF DEATH: 11/06/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.88	0.591
LIVER	20.12	6.327
KIDNEYS	2.14	0.673
SPLEEN	0.44	0.138
HEART	1.21	0.381
LUNGS	1.32	0.415
UTERUS/VAGINA	0.97	0.305
THYMUS	0.1556	0.049
OVARIES/OVIDUCTS	0.1438	0.045
ADRENAL GLANDS	0.1053	0.033
THYROIDS/PARATHY	0.0197	0.006
FINAL BODY WT(G)	318.	

		GRADE
GENERAL COMMENT	GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 7,7	P
GENERAL COMMENT	GROSS: CORPORA LUTEA (LEFT,RIGHT) 7,7	P
ESOPHAGUS	MICRO: DEGENERATION, MUSCLE	1
HEART	MICRO: CARDIOMYOPATHY	1
LN, MANDIBULAR	MICRO: PLASMACYTOSIS, MEDULLARY	2
LIVER	MICRO: HYPERTROPHY, HEPATOCELLULAR, CENTRILOBULAR	1
MAMMARY GLAND	MICRO: HYPERPLASIA, PHYSIOLOGIC LACTATION	2
THYROID GLANDS	MICRO: HYPERTROPHY, EPITHELIAL	1
	VACUOLATION, CYTOPLASMIC	1
PARATHYROIDS	MICRO: NO SIGNIFICANT CHANGES OBSERVED ONE OF PAIR PRESENT	
VAGINA	MICRO: ESTROUS CYCLE: ANESTRUS, LACTATIONAL	P
UTERUS	MICRO: INVOLUTION	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES	NERVES, OPTIC	HEART
	ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
	LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
	NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS
	PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND
	STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	VAGINA	CERVIX	LN, AXILLARY	UTERUS
MICRO:	ADRENAL CORTEX	ADRENAL MEDULLA	AORTA	STERNEBRAE
	MARROW, STERN	FEMUR	MARROW, FEMUR	BRAIN
	CECUM	COLON	DUODENUM	EYES

ANIMAL NO. 81980 GROUP 5: 900 MG/KG FEMALE SCHEDULED EUTH 11/06/10 DATE OF DEATH: 11/06/10

GRADE

NERVES, OPTIC	ILEUM	JEJUNUM	KIDNEYS
LN, MESENTERIC	LUNGS	NERVE, SCIATIC	OVIDUCTS
OVARIES	PANCREAS	PITUITARY	RECTUM
SPINAL CORD	SAL. GLAND MAND	STOMACH, GLAN	STOMACH, NON
SKELETAL MUSCLE	SKIN	SPLEEN	PARATHYROIDS
THYMUS	TRACHEA	URINARY BLADDER	CERVIX
LN, AXILLARY			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81928 GROUP 6: 60 MG/KG CYC FEMALE SCHEDULED EUTH 11/01/10 DATE OF DEATH: 11/01/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.80	0.655
LIVER	10.92	3.971
KIDNEYS	1.99	0.724
SPLEEN	0.37	0.135
HEART	0.87	0.316
LUNGS	1.21	0.440
UTERUS/VAGINA	0.89	0.324
THYMUS	0.0919	0.033
OVARIES/OVIDUCTS	0.1326	0.048
ADRENAL GLANDS	0.0775	0.028
THYROIDS/PARATHY	0.0159	0.006
FINAL BODY WT(G)	275.	

GENERAL COMMENT
KIDNEYS
GENERAL COMMENT
NO SIGNIFICANT
CHANGES OBSERVED

	GRADE
GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 8,5	P
GROSS: CORPORA LUTEA (LEFT,RIGHT) 8,5	P
GROSS: AREA(S), DEPRESSED FEW, PINPOINT TO 2 MM IN DIAMETER, IN CORTEX, BILATERAL	P

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
THYMUS	TRACHEA	URINARY BLADDER	VAGINA
CERVIX	LN, AXILLARY	UTERUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81935 GROUP 6: 60 MG/KG CYC FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.05	0.591
LIVER	12.32	3.550
KIDNEYS	2.35	0.677
SPLEEN	0.49	0.141
HEART	1.21	0.349
LUNGS	1.39	0.401
UTERUS/VAGINA	0.83	0.239
THYMUS	0.1746	0.050
OVARIES/OVIDUCTS	0.1634	0.047
ADRENAL GLANDS	0.1023	0.029
THYROIDS/PARATHY	0.0165	0.005
FINAL BODY WT(G)	347.	

GENERAL COMMENT
KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) P
6,6
GROSS: CORPORA LUTEA (LEFT,RIGHT) P
6,9
GROSS: AREA(S), DEPRESSED P
ONE, 1 MM IN DIAMETER, IN CORTEX, RIGHT

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
THYMUS	TRACHEA	URINARY BLADDER	VAGINA
CERVIX	LN, AXILLARY	UTERUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81949 GROUP 6: 60 MG/KG CYC FEMALE SCHEDULED EUTH 11/03/10 DATE OF DEATH: 11/03/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.85	0.621
LIVER	11.04	3.705
KIDNEYS	2.03	0.681
SPLEEN	0.46	0.154
HEART	0.96	0.322
LUNGS	1.28	0.430
UTERUS/VAGINA	1.08	0.362
THYMUS	0.1488	0.050
OVARIES/OVIDUCTS	0.1408	0.047
ADRENAL GLANDS	0.0864	0.029
THYROIDS/PARATHY	0.0206	0.007
FINAL BODY WT(G)	298.	

GENERAL COMMENT
KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) P
5,7
GROSS: CORPORA LUTEA (LEFT,RIGHT) P
6,7
GROSS: AREA(S), DEPRESSED P
FEW, PINPOINT, IN CORTEX, BILATERAL

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	LN, MANDIBULAR	LIVER
LN, MESENTERIC	LUNGS	MAMMARY GLAND	NERVE, SCIATIC
OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
THYMUS	TRACHEA	URINARY BLADDER	VAGINA
CERVIX	LN, AXILLARY	UTERUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81953 GROUP 6: 60 MG/KG CYC FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.87	0.658
LIVER	11.17	3.933
KIDNEYS	2.07	0.729
SPLEEN	0.43	0.151
HEART	1.02	0.359
LUNGS	1.74	0.613
UTERUS/VAGINA	1.01	0.356
THYMUS	0.1988	0.070
OVARIES/OVIDUCTS	0.1280	0.045
ADRENAL GLANDS	0.0886	0.031
THYROIDS/PARATHY	0.0182	0.006
FINAL BODY WT(G)	284.	

GENERAL COMMENT
LUNGS
THYMUS
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) P
7,7
GENERAL COMMENT
GROSS: CORPORA LUTEA (LEFT,RIGHT) P
7,7
GROSS: DISCOLORATION, DARK RED P
ALL LOBES
GROSS: DISCOLORATION, DARK RED P

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	MAMMARY GLAND	NERVE, SCIATIC
OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
TRACHEA	URINARY BLADDER	VAGINA	CERVIX
LN, AXILLARY	UTERUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 81970 GROUP 6: 60 MG/KG CYC FEMALE SCHEDULED EUTH 11/02/10 DATE OF DEATH: 11/02/10

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.85	0.688
LIVER	10.88	4.045
KIDNEYS	2.05	0.762
SPLEEN	0.49	0.182
HEART	1.11	0.413
LUNGS	2.16	0.803
UTERUS/VAGINA	1.11	0.413
THYMUS	0.1101	0.041
OVARIES/OVIDUCTS	0.1333	0.050
ADRENAL GLANDS	0.0695	0.026
THYROIDS/PARATHY	0.0143	0.005
FINAL BODY WT(G)	269.	

GENERAL COMMENT
NO SIGNIFICANT CHANGES OBSERVED

GENERAL COMMENT
LUNGS
TRACHEA

GRADE

GROSS: FORMER IMPLANTATION SITES (LEFT,RIGHT) 5,8 — P
GROSS: CORPORA LUTEA (LEFT,RIGHT) 5,8 — P
GROSS: DISCOLORATION, DARK RED ALL LOBES — P
GROSS: CONTENTS, DARK RED — P

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	FEMUR
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES	NERVES, OPTIC	HEART
ILEUM	JEJUNUM	KIDNEYS	LN, MANDIBULAR
LIVER	LN, MESENTERIC	MAMMARY GLAND	NERVE, SCIATIC
OVIDUCTS	OVARIES	PANCREAS	PITUITARY
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS
THYMUS	URINARY BLADDER	VAGINA	CERVIX
LN, AXILLARY	UTERUS		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A94 (F0 FEMALES - LACTATION DAY 4)

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CORPORA LUTEA AND IMPLANTATION SITES

DAM NO.	IMPLANTATION SITES	PUPS BORN	UNACCOUNTED SITES	SHAM CONTROL CORPORA LUTEA
81924	15	15	0	15
81940	17	13	4	17
81944	15	14	1	15
81952	17	16	1	19
81963	15	15	0	23
MEAN	15.8	14.6	1.2	17.8
S.D.	1.10	1.14	1.64	3.35
S.E.	0.49	0.51	0.73	1.50
N	5	5	5	5

NOTE: ONLY DAMS THAT HAVE DELIVERED ONE OR MORE PUPS ARE INCLUDED IN CALCULATION OF MEAN.

TABLE A94 (F0 FEMALES - LACTATION DAY 4)

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CORPORA LUTEA AND IMPLANTATION SITES

0 MG/KG

DAM NO.	IMPLANTATION SITES	PUPS BORN	UNACCOUNTED SITES	CORPORA LUTEA
81920	13	13	0	13
81938	16	15	1	16
81939	15	14	1	16
81942	17	15	2	19
81950	10	10	0	12
81958	17	16	1	17
81967	18	16	2	18
81975	14	13	1	14
81979	15	15	0	15
MEAN	15.0	14.1	0.9	15.6
S.D.	2.45	1.90	0.78	2.30
S.E.	0.82	0.63	0.26	0.77
N	9	9	9	9

NOTE: ONLY DAMS THAT HAVE DELIVERED ONE OR MORE PUPS ARE INCLUDED IN CALCULATION OF MEAN.

TABLE A94 (F0 FEMALES - LACTATION DAY 4)

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CORPORA LUTEA AND IMPLANTATION SITES

100 MG/KG

DAM NO.	IMPLANTATION SITES	PUPS BORN	UNACCOUNTED SITES	CORPORA LUTEA
81915	15	12	3	16
81916	13	11	2	13
81917	14	13	1	15
81921	13	13	0	13
81926	12	12	0	12
81930	12	12	0	13
81941	13	13	0	13
81960	15	15	0	16
81961	14	14	0	14
81962	15	14	1	15
81972	13	13	0	13
81978	14	13	1	15
MEAN	13.6	12.9	0.7	14.0
S.D.	1.08	1.08	0.98	1.35
S.E.	0.31	0.31	0.28	0.39
N	12	12	12	12

NOTE: ONLY DAMS THAT HAVE DELIVERED ONE OR MORE PUPS ARE INCLUDED IN CALCULATION OF MEAN.

TABLE A94 (F0 FEMALES - LACTATION DAY 4)

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CORPORA LUTEA AND IMPLANTATION SITES

300 MG/KG

DAM NO.	IMPLANTATION SITES	PUPS BORN	UNACCOUNTED SITES	CORPORA LUTEA
81914	15	15	0	15
81931	14	13	1	19
81934	13	11	2	16
81943	12	12	0	14
81946	13	12	1	13
81957	11	10	1	11
81959	14	13	1	14
81974	12	10	2	13
81976	13	13	0	21
81977	13	11	2	15
MEAN	13.0	12.0	1.0	15.1
S.D.	1.15	1.56	0.82	2.96
S.E.	0.37	0.49	0.26	0.94
N	10	10	10	10

NOTE: ONLY DAMS THAT HAVE DELIVERED ONE OR MORE PUPS ARE INCLUDED IN CALCULATION OF MEAN.

TABLE A94 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CORPORA LUTEA AND IMPLANTATION SITES

900 MG/KG

DAM NO.	IMPLANTATION SITES	PUPS BORN	UNACCOUNTED SITES	CORPORA LUTEA
81918	16	16	0	18
81919	10	9	1	11
81927	10	9	1	11
81936	14	14	0	14
81937	2	1	1	12
81951	15	11	4	16
81955	12	10	2	13
81964	15	14	1	15
81968	12	12	0	12
81969	14	12	2	14
81973	12	9	3	15
81980	14	12	2	14
MEAN	12.2	10.8	1.4	13.8
S.D.	3.74	3.79	1.24	2.09
S.E.	1.08	1.09	0.36	0.60
N	12	12	12	12

NOTE: ONLY DAMS THAT HAVE DELIVERED ONE OR MORE PUPS ARE INCLUDED IN CALCULATION OF MEAN.

60 MG/KG CYC

DAM NO.	IMPLANTATION SITES	PUPS BORN	UNACCOUNTED SITES	CORPORA LUTEA
81928	13	13	0	13
81935	12	12	0	15
81949	12	11	1	13
81953	14	13	1	14
81970	13	13	0	13
MEAN	12.8	12.4	0.4	13.6
S.D.	0.84	0.89	0.55	0.89
S.E.	0.37	0.40	0.24	0.40
N	5	5	5	5

NOTE: ONLY DAMS THAT HAVE DELIVERED ONE OR MORE PUPS ARE INCLUDED IN CALCULATION OF MEAN.

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: SHAM CONTROL

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81983	467.	2.12	14.99	3.87	0.72	1.49	1.65
81990	474.	2.03	15.74	3.26	0.77	1.37	1.56
82004	470.	2.25	16.26	3.65	0.95	1.47	1.80
82012	498.	2.03	17.44	3.32	0.81	1.61	1.55
82017	424.	1.89	13.61	3.45	0.66	1.40	1.45
MEAN	467.	2.06	15.61	3.51	0.78	1.47	1.60
S.D.	26.8	0.133	1.429	0.251	0.109	0.093	0.131
S.E.	12.0	0.059	0.639	0.112	0.049	0.042	0.059
N	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

MALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81988	438.	2.10	11.61	3.04	0.59	1.29	1.43
81989	384.	2.05	10.50	2.94	0.71	1.30	1.49
81991	483.	1.99	15.21	3.22	0.73	1.46	1.56
81996	385.	2.09	12.41	2.85	0.56	1.19	1.21
81997	455.	2.03	15.02	3.60	0.60	1.48	1.54
81998	477.	2.01	13.77	3.23	0.82	1.81	1.98
82014	555.	2.17	17.87	3.29	0.64	1.90	1.76
82020	449.	2.06	13.39	3.37	0.56	1.54	1.50
82021	441.	1.99	11.43	3.36	0.58	1.35	1.44
82025	457.	2.05	13.04	3.11	0.57	1.40	1.44
82038	480.	2.10	14.56	3.24	0.78	1.42	1.80
82041	444.	2.07	12.70	3.26	0.58	1.36	1.45
MEAN	454.	2.06	13.46	3.21	0.64	1.46	1.55
S.D.	45.2	0.052	2.009	0.203	0.092	0.208	0.205
S.E.	13.0	0.015	0.580	0.059	0.027	0.060	0.059
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 100 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81982	459.	2.15	14.92	3.82	0.67	1.38	1.43
81987	375.	2.02	10.96	2.74	0.62	1.18	1.32
81994	441.	2.17	14.76	3.73	0.81	1.27	1.52
82001	471.	2.13	16.26	3.56	0.89	1.53	1.41
82003	518.	2.11	15.09	3.30	0.67	1.41	1.42
82007	483.	2.21	16.00	3.73	0.81	1.43	1.77
82011	431.	2.00	12.64	3.19	0.65	1.46	1.48
82016	508.	2.17	16.22	3.69	0.70	1.71	1.55
82022	424.	1.85	12.60	2.68	0.70	1.36	1.65
82024	405.	2.06	12.26	3.30	0.56	1.38	1.46
82034	392.	2.14	10.66	3.10	0.47	1.27	1.40
82046	464.	2.06	15.40	3.71	0.60	1.49	1.65
MEAN	448.	2.09	13.98	3.38	0.68	1.41	1.51
S.D.	44.6	0.099	2.041	0.393	0.116	0.138	0.129
S.E.	12.9	0.029	0.589	0.114	0.034	0.040	0.037
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81993	369.	2.00	11.90	2.88	0.61	1.11	1.21
81995	397.	2.04	15.08	3.29	0.54	1.49	1.36
82000	459.	2.23	16.04	3.56	0.89	1.60	1.67
82002	453.	2.23	16.18	3.68	0.65	1.45	1.54
82005	457.	2.24	18.48	3.91	0.65	1.48	1.46
82013	421.	2.08	13.45	3.10	0.62	1.33	1.95
82015	421.	2.03	15.68	3.26	0.69	1.35	1.38
82023	456.	1.99	16.94	3.85	0.64	1.56	1.52
82031	463.	1.93	17.09	3.92	0.61	1.48	1.46
82036	499.	2.11	17.50	3.74	0.80	1.53	1.45
82039	422.	2.05	15.81	3.59	0.65	1.39	1.39
82044	447.	2.11	14.18	3.57	0.68	1.40	1.68
MEAN	439.	2.09	15.69	3.53	0.67	1.43	1.51
S.D.	34.4	0.102	1.834	0.332	0.093	0.130	0.191
S.E.	9.9	0.029	0.529	0.096	0.027	0.038	0.055
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 900 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
82006	468.	2.04	21.62	4.52	0.71	1.50	1.36
82009	446.	2.01	23.62	4.43	0.68	1.44	1.40
82010	412.	2.01	21.96	3.92	0.66	1.46	1.47
82018	415.	1.97	19.88	3.76	0.64	1.23	1.28
82028	421.	2.09	21.01	4.10	0.64	1.48	1.53
82029	403.	2.10	17.73	3.52	0.74	1.31	1.70
82030	387.	2.00	18.64	3.00	0.61	1.30	1.49
82035	420.	2.05	21.09	3.76	0.56	1.38	1.36
82037	397.	1.96	17.61	3.43	0.67	1.20	1.32
82040	428.	2.05	21.00	4.06	0.59	1.18	1.33
82042	376.	2.03	17.04	3.28	0.62	1.25	1.32
82043	372.	1.99	18.11	3.45	0.53	1.11	1.32
MEAN	412.	2.03	19.94	3.77	0.64	1.32	1.41
S.D.	27.8	0.044	2.085	0.460	0.060	0.130	0.121
S.E.	8.0	0.013	0.602	0.133	0.017	0.038	0.035
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

MALE GROUP: 60 MG/KG CYC

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81985	442.	2.17	15.69	3.40	0.56	1.47	2.01
81992	471.	2.03	16.62	3.66	0.58	1.53	1.54
82008	462.	2.05	14.37	3.39	0.53	1.60	1.51
82026	495.	2.18	18.14	4.61	0.49	1.60	1.68
82033	459.	1.88	14.50	3.11	0.44	1.44	1.37
MEAN	466.	2.06	15.86	3.63	0.52	1.53	1.62
S.D.	19.4	0.122	1.571	0.579	0.056	0.073	0.243
S.E.	8.7	0.055	0.703	0.259	0.025	0.033	0.109
N	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: SHAM CONTROL

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81983	1.64	1.66	0.55	0.61	0.3302	0.0656	0.0180
81990	1.62	1.59	0.62	0.61	0.3045	0.0502	0.0181
82004	1.81	1.73	0.63	0.70	0.5263	0.0597	0.0220
82012	1.68	1.60	0.62	0.59	0.3183	0.0647	0.0178
82017	1.63	0.79	0.66	0.34	0.3174	0.0441	0.0190
MEAN	1.68	1.47	0.62	0.57	0.3593	0.0569	0.0190
S.D.	0.078	0.386	0.040	0.135	0.09378	0.00940	0.00175
S.E.	0.035	0.173	0.018	0.061	0.04194	0.00420	0.00078
N	5	5	5	5	5	5	5

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 0 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81988	1.53	1.53	0.56	0.53	0.4307	0.0454	0.0189
81989	1.52	1.52	0.60	0.63	0.1814	0.0469	0.0180
81991	1.64	1.58	0.60	0.58	0.2833	0.0620	0.0175
81996	1.53	1.56	0.57	0.54	0.3029	0.0641	0.0180
81997	1.79	1.78	0.59	0.61	0.3309	0.0536	0.0188
81998	1.67	1.65	0.63	0.64	0.4070	0.0538	0.0219
82014	1.70	1.67	0.57	0.55	0.1880	0.0551	0.0194
82020	2.05	2.12	0.73	0.71	0.2673	0.0681	0.0179
82021	1.60	1.62	0.59	0.57	0.5348	0.0502	0.0181
82025	1.75	1.73	0.69	0.62	0.3203	0.0526	0.0178
82038	1.56	1.63	0.62	0.57	0.5409	0.0634	0.0188
82041	1.60	1.63	0.69	0.61	0.2991	0.0528	0.0192
MEAN	1.66	1.67	0.62	0.60	0.3406	0.0557	0.0187
S.D.	0.151	0.161	0.055	0.051	0.11728	0.00716	0.00118
S.E.	0.043	0.047	0.016	0.015	0.03386	0.00207	0.00034
N	12	12	12	12	12	12	12

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 100 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81982	1.73	1.78	0.58	0.61	0.2712	0.0827	0.0230
81987	1.58	1.59	0.64	0.61	0.2065	0.0455	0.0187
81994	1.74	1.76	0.66	0.62	0.2539	0.0579	0.0180
82001	1.68	1.69	0.64	0.63	0.4515	0.0707	0.0189
82003	1.59	1.64	0.61	0.65	0.3240	0.0596	0.0215
82007	1.79	1.79	0.61	0.61	0.5196	0.0688	0.0202
82011	1.69	1.63	0.60	0.57	0.3216	0.0668	0.0211
82016	1.51	1.55	0.66	0.63	0.2690	0.0616	0.0210
82022	1.39	1.38	0.58	0.55	0.4146	0.0481	0.0181
82024	1.92	1.95	0.59	0.61	0.2244	0.0604	0.0212
82034	1.56	1.61	0.60	0.61	0.1923	0.0452	0.0182
82046	1.44	1.41	0.56	0.49	0.3104	0.0608	0.0192
MEAN	1.64	1.65	0.61	0.60	0.3133	0.0607	0.0199
S.D.	0.152	0.161	0.033	0.043	0.10150	0.01098	0.00163
S.E.	0.044	0.047	0.009	0.013	0.02930	0.00317	0.00047
N	12	12	12	12	12	12	12

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 300 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81993	1.72	1.68	0.66	0.61	0.2773	0.0474	0.0187
81995	1.92	1.89	0.64	0.69	0.2502	0.0631	0.0189
82000	1.91	1.97	0.74	0.72	0.3683	0.0662	0.0189
82002	1.91	1.87	0.71	0.69	0.2870	0.0783	0.0175
82005	1.78	1.75	0.64	0.64	0.2716	0.0701	0.0239
82013	1.85	1.86	0.70	0.72	0.2440	0.0535	0.0192
82015	1.74	1.81	0.59	0.60	0.3235	0.0539	0.0182
82023	1.76	1.74	0.69	0.66	0.4021	0.0550	0.0179
82031	1.87	1.92	0.71	0.69	0.2268	0.0655	0.0222
82036	1.90	2.15	0.64	0.69	0.3476	0.0558	0.0202
82039	1.65	1.66	0.64	0.64	0.2323	0.0629	0.0205
82044	1.57	1.58	0.61	0.56	0.3466	0.0621	0.0235
MEAN	1.80	1.82	0.66	0.66	0.2981	0.0612	0.0200
S.D.	0.114	0.155	0.045	0.050	0.05806	0.00849	0.00216
S.E.	0.033	0.045	0.013	0.014	0.01676	0.00245	0.00062
N	12	12	12	12	12	12	12

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 900 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
82006	1.80	1.75	0.63	0.58	0.3397	0.0719	0.0190
82009	1.82	1.76	0.73	0.66	0.2252	0.0491	0.0209
82010	1.57	1.62	0.62	0.61	0.2340	0.0617	0.0219
82018	1.68	1.63	0.63	0.61	0.2786	0.0531	0.0193
82028	2.02	2.05	0.74	0.74	0.2132	0.0619	0.0239
82029	1.65	1.56	0.67	0.63	0.2845	0.0665	0.0196
82030	1.65	1.58	0.62	0.62	0.3839	0.0592	0.0193
82035	1.85	1.83	0.68	0.64	0.2940	0.0543	0.0198
82037	1.46	1.49	0.68	0.63	0.2081	0.0470	0.0229
82040	1.80	1.77	0.73	0.69	0.2078	0.0648	0.0195
82042	1.48	1.49	0.53	0.49	0.3834	0.0605	0.0210
82043	1.48	1.58	0.57	0.60	0.2152	0.0653	0.0185
MEAN	1.69	1.68	0.65	0.63	0.2723	0.0596	0.0205
S.D.	0.174	0.163	0.065	0.061	0.06655	0.00744	0.00168
S.E.	0.050	0.047	0.019	0.017	0.01921	0.00215	0.00049
N	12	12	12	12	12	12	12

TABLE A95 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 60 MG/KG CYC

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81985	1.78	1.80	0.67	0.64	0.2236	0.0693	0.0202
81992	1.94	1.94	0.67	0.64	0.2104	0.0610	0.0197
82008	1.53	1.53	0.62	0.59	0.1663	0.0656	0.0229
82026	1.84	1.79	0.69	0.68	0.1333	0.0777	0.0283
82033	1.75	1.66	0.59	0.57	0.1368	0.0610	0.0206
MEAN	1.77	1.74	0.65	0.62	0.1741	0.0669	0.0223
S.D.	0.152	0.155	0.041	0.044	0.04149	0.00696	0.00355
S.E.	0.068	0.069	0.019	0.020	0.01855	0.00311	0.00159
N	5	5	5	5	5	5	5

POFBWv4.25
12/15/2010

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: SHAM CONTROL

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81983	467.	0.454	3.210	0.829	0.154	0.319	0.353
81990	474.	0.428	3.321	0.688	0.162	0.289	0.329
82004	470.	0.479	3.460	0.777	0.202	0.313	0.383
82012	498.	0.408	3.502	0.667	0.163	0.323	0.311
82017	424.	0.446	3.210	0.814	0.156	0.330	0.342
MEAN	467.	0.440	3.340	0.750	0.170	0.310	0.340
S.D.	26.8	0.0268	0.1367	0.0736	0.0198	0.0158	0.0269
S.E.	12.0	0.0120	0.0611	0.0329	0.0088	0.0071	0.0121
N	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81988	438.	0.479	2.651	0.694	0.135	0.295	0.326
81989	384.	0.534	2.734	0.766	0.185	0.339	0.388
81991	483.	0.412	3.149	0.667	0.151	0.302	0.323
81996	385.	0.543	3.223	0.740	0.145	0.309	0.314
81997	455.	0.446	3.301	0.791	0.132	0.325	0.338
81998	477.	0.421	2.887	0.677	0.172	0.379	0.415
82014	555.	0.391	3.220	0.593	0.115	0.342	0.317
82020	449.	0.459	2.982	0.751	0.125	0.343	0.334
82021	441.	0.451	2.592	0.762	0.132	0.306	0.327
82025	457.	0.449	2.853	0.681	0.125	0.306	0.315
82038	480.	0.438	3.033	0.675	0.163	0.296	0.375
82041	444.	0.466	2.860	0.734	0.131	0.306	0.327
MEAN	454.	0.460	2.960	0.710	0.140	0.320	0.340
S.D.	45.2	0.0448	0.2342	0.0561	0.0212	0.0255	0.0328
S.E.	13.0	0.0129	0.0676	0.0162	0.0061	0.0074	0.0095
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 100 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81982	459.	0.468	3.251	0.832	0.146	0.301	0.312
81987	375.	0.539	2.923	0.731	0.165	0.315	0.352
81994	441.	0.492	3.347	0.846	0.184	0.288	0.345
82001	471.	0.452	3.452	0.756	0.189	0.325	0.299
82003	518.	0.407	2.913	0.637	0.129	0.272	0.274
82007	483.	0.458	3.313	0.772	0.168	0.296	0.366
82011	431.	0.464	2.933	0.740	0.151	0.339	0.343
82016	508.	0.427	3.193	0.726	0.138	0.337	0.305
82022	424.	0.436	2.972	0.632	0.165	0.321	0.389
82024	405.	0.509	3.027	0.815	0.138	0.341	0.360
82034	392.	0.546	2.719	0.791	0.120	0.324	0.357
82046	464.	0.444	3.319	0.800	0.129	0.321	0.356
MEAN	448.	0.470	3.110	0.760	0.150	0.310	0.340
S.D.	44.6	0.0432	0.2273	0.0687	0.0223	0.0215	0.0333
S.E.	12.9	0.0125	0.0656	0.0198	0.0064	0.0062	0.0096
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81993	369.	0.542	3.225	0.780	0.165	0.301	0.328
81995	397.	0.514	3.798	0.829	0.136	0.375	0.343
82000	459.	0.486	3.495	0.776	0.194	0.349	0.364
82002	453.	0.492	3.572	0.812	0.143	0.320	0.340
82005	457.	0.490	4.044	0.856	0.142	0.324	0.319
82013	421.	0.494	3.195	0.736	0.147	0.316	0.463
82015	421.	0.482	3.724	0.774	0.164	0.321	0.328
82023	456.	0.436	3.715	0.844	0.140	0.342	0.333
82031	463.	0.417	3.691	0.847	0.132	0.320	0.315
82036	499.	0.423	3.507	0.749	0.160	0.307	0.291
82039	422.	0.486	3.746	0.851	0.154	0.329	0.329
82044	447.	0.472	3.172	0.799	0.152	0.313	0.376
MEAN	439.	0.480	3.570	0.800	0.150	0.330	0.340
S.D.	34.4	0.0365	0.2688	0.0413	0.0169	0.0204	0.0434
S.E.	9.9	0.0105	0.0776	0.0119	0.0049	0.0059	0.0125
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 900 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
82006	468.	0.436	4.620	0.966	0.152	0.321	0.291
82009	446.	0.451	5.296	0.993	0.152	0.323	0.314
82010	412.	0.488	5.330	0.951	0.160	0.354	0.357
82018	415.	0.475	4.790	0.906	0.154	0.296	0.308
82028	421.	0.496	4.990	0.974	0.152	0.352	0.363
82029	403.	0.521	4.400	0.873	0.184	0.325	0.422
82030	387.	0.517	4.817	0.775	0.158	0.336	0.385
82035	420.	0.488	5.021	0.895	0.133	0.329	0.324
82037	397.	0.494	4.436	0.864	0.169	0.302	0.332
82040	428.	0.479	4.907	0.949	0.138	0.276	0.311
82042	376.	0.540	4.532	0.872	0.165	0.332	0.351
82043	372.	0.535	4.868	0.927	0.142	0.298	0.355
MEAN	412.	0.490	4.830	0.910	0.150	0.320	0.340
S.D.	27.8	0.0316	0.3034	0.0609	0.0138	0.0233	0.0370
S.E.	8.0	0.0091	0.0876	0.0176	0.0040	0.0067	0.0107
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 60 MG/KG CYC

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81985	442.	0.491	3.550	0.769	0.127	0.333	0.455
81992	471.	0.431	3.529	0.777	0.123	0.325	0.327
82008	462.	0.444	3.110	0.734	0.115	0.346	0.327
82026	495.	0.440	3.665	0.931	0.099	0.323	0.339
82033	459.	0.410	3.159	0.678	0.096	0.314	0.298
MEAN	466.	0.440	3.400	0.780	0.110	0.330	0.350
S.D.	19.4	0.0299	0.2505	0.0944	0.0139	0.0122	0.0608
S.E.	8.7	0.0134	0.1120	0.0422	0.0062	0.0054	0.0272
N	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: SHAM CONTROL

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81983	0.351	0.355	0.118	0.131	0.071	0.014	0.004
81990	0.342	0.335	0.131	0.129	0.064	0.011	0.004
82004	0.385	0.368	0.134	0.149	0.112	0.013	0.005
82012	0.337	0.321	0.124	0.118	0.064	0.013	0.004
82017	0.384	0.186	0.156	0.080	0.075	0.010	0.004
MEAN	0.360	0.310	0.130	0.120	0.077	0.012	0.004
S.D.	0.0232	0.0732	0.0143	0.0255	0.0200	0.0016	0.0005
S.E.	0.0104	0.0328	0.0064	0.0114	0.0089	0.0007	0.0002
N	5	5	5	5	5	5	5

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 0 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81988	0.349	0.349	0.128	0.121	0.098	0.010	0.004
81989	0.396	0.396	0.156	0.164	0.047	0.012	0.005
81991	0.340	0.327	0.124	0.120	0.059	0.013	0.004
81996	0.397	0.405	0.148	0.140	0.079	0.017	0.005
81997	0.393	0.391	0.130	0.134	0.073	0.012	0.004
81998	0.350	0.346	0.132	0.134	0.085	0.011	0.005
82014	0.306	0.301	0.103	0.099	0.034	0.010	0.004
82020	0.457	0.472	0.163	0.158	0.060	0.015	0.004
82021	0.363	0.367	0.134	0.129	0.121	0.011	0.004
82025	0.383	0.379	0.151	0.136	0.070	0.012	0.004
82038	0.325	0.340	0.129	0.119	0.113	0.013	0.004
82041	0.360	0.367	0.155	0.137	0.067	0.012	0.004
MEAN	0.370	0.370	0.140	0.130	0.075	0.012	0.004
S.D.	0.0400	0.0441	0.0172	0.0175	0.0257	0.0019	0.0004
S.E.	0.0115	0.0127	0.0050	0.0050	0.0074	0.0006	0.0001
N	12	12	12	12	12	12	12

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 100 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81982	0.377	0.388	0.126	0.133	0.059	0.018	0.005
81987	0.421	0.424	0.171	0.163	0.055	0.012	0.005
81994	0.395	0.399	0.150	0.141	0.058	0.013	0.004
82001	0.357	0.359	0.136	0.134	0.096	0.015	0.004
82003	0.307	0.317	0.118	0.125	0.063	0.012	0.004
82007	0.371	0.371	0.126	0.126	0.108	0.014	0.004
82011	0.392	0.378	0.139	0.132	0.075	0.015	0.005
82016	0.297	0.305	0.130	0.124	0.053	0.012	0.004
82022	0.328	0.325	0.137	0.130	0.098	0.011	0.004
82024	0.474	0.481	0.146	0.151	0.055	0.015	0.005
82034	0.398	0.411	0.153	0.156	0.049	0.012	0.005
82046	0.310	0.304	0.121	0.106	0.067	0.013	0.004
MEAN	0.370	0.370	0.140	0.130	0.069	0.014	0.004
S.D.	0.0524	0.0537	0.0152	0.0155	0.0199	0.0020	0.0004
S.E.	0.0151	0.0155	0.0044	0.0045	0.0058	0.0006	0.0001
N	12	12	12	12	12	12	12

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 300 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81993	0.466	0.455	0.179	0.165	0.075	0.013	0.005
81995	0.484	0.476	0.161	0.174	0.063	0.016	0.005
82000	0.416	0.429	0.161	0.157	0.080	0.014	0.004
82002	0.422	0.413	0.157	0.152	0.063	0.017	0.004
82005	0.389	0.383	0.140	0.140	0.059	0.015	0.005
82013	0.439	0.442	0.166	0.171	0.058	0.013	0.005
82015	0.413	0.430	0.140	0.143	0.077	0.013	0.004
82023	0.386	0.382	0.151	0.145	0.088	0.012	0.004
82031	0.404	0.415	0.153	0.149	0.049	0.014	0.005
82036	0.381	0.431	0.128	0.138	0.070	0.011	0.004
82039	0.391	0.393	0.152	0.152	0.055	0.015	0.005
82044	0.351	0.353	0.136	0.125	0.078	0.014	0.005
MEAN	0.410	0.420	0.150	0.150	0.068	0.014	0.005
S.D.	0.0373	0.0345	0.0142	0.0142	0.0118	0.0017	0.0005
S.E.	0.0108	0.0100	0.0041	0.0041	0.0034	0.0005	0.0001
N	12	12	12	12	12	12	12

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 900 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
82006	0.385	0.374	0.135	0.124	0.073	0.015	0.004
82009	0.408	0.395	0.164	0.148	0.050	0.011	0.005
82010	0.381	0.393	0.150	0.148	0.057	0.015	0.005
82018	0.405	0.393	0.152	0.147	0.067	0.013	0.005
82028	0.480	0.487	0.176	0.176	0.051	0.015	0.006
82029	0.409	0.387	0.166	0.156	0.071	0.017	0.005
82030	0.426	0.408	0.160	0.160	0.099	0.015	0.005
82035	0.440	0.436	0.162	0.152	0.070	0.013	0.005
82037	0.368	0.375	0.171	0.159	0.052	0.012	0.006
82040	0.421	0.414	0.171	0.161	0.049	0.015	0.005
82042	0.394	0.396	0.141	0.130	0.102	0.016	0.006
82043	0.398	0.425	0.153	0.161	0.058	0.018	0.005
MEAN	0.410	0.410	0.160	0.150	0.067	0.014	0.005
S.D.	0.0300	0.0312	0.0125	0.0141	0.0181	0.0020	0.0005
S.E.	0.0087	0.0090	0.0036	0.0041	0.0052	0.0006	0.0001
N	12	12	12	12	12	12	12

TABLE A96 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 60 MG/KG CYC

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81985	0.403	0.407	0.152	0.145	0.051	0.016	0.005
81992	0.412	0.412	0.142	0.136	0.045	0.013	0.004
82008	0.331	0.331	0.134	0.128	0.036	0.014	0.005
82026	0.372	0.362	0.139	0.137	0.027	0.016	0.006
82033	0.381	0.362	0.129	0.124	0.030	0.013	0.004
MEAN	0.380	0.370	0.140	0.130	0.038	0.014	0.005
S.D.	0.0316	0.0342	0.0087	0.0082	0.0099	0.0013	0.0006
S.E.	0.0141	0.0153	0.0039	0.0037	0.0044	0.0006	0.0003
N	5	5	5	5	5	5	5

POFBWv4.25
12/15/2010

FINAL REPORT

Contents:	Volume 6 of 6 (Appendix P [Tables A97-A110])
Study Title:	A Combined 28-Day Repeated Dose Oral (Gavage) Toxicity Study with the Reproduction/Developmental Toxicity Screening Test of Naphthenic Acid with a Mammalian Erythrocyte Micronucleus Test in Rats
Laboratory Project ID:	WIL-402011
Author:	[redacted]
Test Guideline:	U.S. EPA OPPTS 870.3650 and 870.5395, ICH Guideline S2A and S2B, and OECD Guidelines 422 and 474
Study Completion Date:	30 August 2012
Performing Laboratory:	WIL Research Laboratories, LLC 1407 George Road Ashland, OH 44805-8946
Sponsor:	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
Total Number of Pages:	1897

APPENDIX P

Individual Animal Data (continued)

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: SHAM CONTROL

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81983	467.	2.12	707.076	182.547	33.962	70.283	77.830
81990	474.	2.03	775.370	160.591	37.931	67.488	76.847
82004	470.	2.25	722.667	162.222	42.222	65.333	80.000
82012	498.	2.03	859.113	163.547	39.901	79.310	76.355
82017	424.	1.89	720.106	182.540	34.921	74.074	76.720
MEAN	467.	2.06	756.870	170.290	37.790	71.300	77.550
S.D.	26.8	0.133	62.8428	11.2352	3.4281	5.5460	1.4742
S.E.	12.0	0.059	28.1042	5.0245	1.5331	2.4802	0.6593
N	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81988	438.	2.10	552.857	144.762	28.095	61.429	68.095
81989	384.	2.05	512.195	143.415	34.634	63.415	72.683
81991	483.	1.99	764.322	161.809	36.683	73.367	78.392
81996	385.	2.09	593.780	136.364	26.794	56.938	57.895
81997	455.	2.03	739.902	177.340	29.557	72.906	75.862
81998	477.	2.01	685.075	160.697	40.796	90.050	98.507
82014	555.	2.17	823.502	151.613	29.493	87.558	81.106
82020	449.	2.06	650.000	163.592	27.184	74.757	72.816
82021	441.	1.99	574.372	168.844	29.146	67.839	72.362
82025	457.	2.05	636.098	151.707	27.805	68.293	70.244
82038	480.	2.10	693.333	154.286	37.143	67.619	85.714
82041	444.	2.07	613.527	157.488	28.019	65.700	70.048
MEAN	454.	2.06	653.250	155.990	31.280	70.820	75.310
S.D.	45.2	0.052	91.9818	11.4689	4.7275	9.8339	10.0918
S.E.	13.0	0.015	26.5529	3.3108	1.3647	2.8388	2.9132
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 100 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81982	459.	2.15	693.953	177.674	31.163	64.186	66.512
81987	375.	2.02	542.574	135.644	30.693	58.416	65.347
81994	441.	2.17	680.184	171.889	37.327	58.525	70.046
82001	471.	2.13	763.380	167.136	41.784	71.831	66.197
82003	518.	2.11	715.166	156.398	31.754	66.825	67.299
82007	483.	2.21	723.982	168.778	36.652	64.706	80.090
82011	431.	2.00	632.000	159.500	32.500	73.000	74.000
82016	508.	2.17	747.465	170.046	32.258	78.802	71.429
82022	424.	1.85	681.081	144.865	37.838	73.514	89.189
82024	405.	2.06	595.146	160.194	27.184	66.990	70.874
82034	392.	2.14	498.131	144.860	21.963	59.346	65.421
82046	464.	2.06	747.573	180.097	29.126	72.330	80.097
MEAN	448.	2.09	668.390	161.420	32.520	67.370	72.210
S.D.	44.6	0.099	84.8982	13.9056	5.3220	6.6408	7.4397
S.E.	12.9	0.029	24.5080	4.0142	1.5363	1.9170	2.1476
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81993	369.	2.00	595.000	144.000	30.500	55.500	60.500
81995	397.	2.04	739.216	161.275	26.471	73.039	66.667
82000	459.	2.23	719.283	159.641	39.910	71.749	74.888
82002	453.	2.23	725.561	165.022	29.148	65.022	69.058
82005	457.	2.24	825.000	174.554	29.018	66.071	65.179
82013	421.	2.08	646.635	149.038	29.808	63.942	93.750
82015	421.	2.03	772.414	160.591	33.990	66.502	67.980
82023	456.	1.99	851.256	193.467	32.161	78.392	76.382
82031	463.	1.93	885.492	203.109	31.606	76.684	75.648
82036	499.	2.11	829.384	177.251	37.915	72.512	68.720
82039	422.	2.05	771.220	175.122	31.707	67.805	67.805
82044	447.	2.11	672.038	169.194	32.227	66.351	79.621
MEAN	439.	2.09	752.710	169.360	32.040	68.630	72.180
S.D.	34.4	0.102	87.3067	16.9337	3.7716	6.2431	8.6968
S.E.	9.9	0.029	25.2033	4.8883	1.0888	1.8022	2.5105
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 900 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
82006	468.	2.04	1059.804	221.569	34.804	73.529	66.667
82009	446.	2.01	1175.125	220.398	33.831	71.642	69.652
82010	412.	2.01	1092.537	195.025	32.836	72.637	73.134
82018	415.	1.97	1009.137	190.863	32.487	62.437	64.975
82028	421.	2.09	1005.263	196.172	30.622	70.813	73.206
82029	403.	2.10	844.286	167.619	35.238	62.381	80.952
82030	387.	2.00	932.000	150.000	30.500	65.000	74.500
82035	420.	2.05	1028.781	183.415	27.317	67.317	66.341
82037	397.	1.96	898.469	175.000	34.184	61.224	67.347
82040	428.	2.05	1024.390	198.049	28.780	57.561	64.878
82042	376.	2.03	839.409	161.576	30.542	61.576	65.025
82043	372.	1.99	910.050	173.367	26.633	55.779	66.332
MEAN	412.	2.03	984.940	186.090	31.480	65.160	69.420
S.D.	27.8	0.044	102.1051	21.9910	2.8849	5.9835	5.0235
S.E.	8.0	0.013	29.4752	6.3483	0.8328	1.7273	1.4502
N	12	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 60 MG/KG CYC

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	LUNGS
81985	442.	2.17	723.041	156.682	25.806	67.742	92.627
81992	471.	2.03	818.719	180.296	28.571	75.369	75.862
82008	462.	2.05	700.976	165.366	25.854	78.049	73.659
82026	495.	2.18	832.110	211.468	22.477	73.394	77.064
82033	459.	1.88	771.277	165.426	23.404	76.596	72.872
MEAN	466.	2.06	769.220	175.850	25.220	74.230	78.420
S.D.	19.4	0.122	57.4442	21.6472	2.3874	4.0085	8.1188
S.E.	8.7	0.055	25.6898	9.6809	1.0677	1.7926	3.6308
N	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: SHAM CONTROL

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS/PARATHY
81983	77.358	78.302	25.943	28.774	15.575	3.094	0.849
81990	79.803	78.325	30.542	30.049	15.000	2.473	0.892
82004	80.444	76.889	28.000	31.111	23.391	2.653	0.978
82012	82.759	78.818	30.542	29.064	15.680	3.187	0.877
82017	86.243	41.799	34.921	17.989	16.794	2.333	1.005
MEAN	81.320	70.830	29.990	27.400	17.288	2.748	0.920
S.D.	3.3567	16.2429	3.3636	5.3387	3.4730	0.3773	0.0677
S.E.	1.5012	7.2640	1.5043	2.3875	1.5532	0.1687	0.0303
N	5	5	5	5	5	5	5

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 0 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81988	72.857	72.857	26.667	25.238	20.510	2.162	0.900
81989	74.146	74.146	29.268	30.732	8.849	2.288	0.878
81991	82.412	79.397	30.151	29.146	14.236	3.116	0.879
81996	73.206	74.641	27.273	25.837	14.493	3.067	0.861
81997	88.177	87.685	29.064	30.049	16.300	2.640	0.926
81998	83.085	82.090	31.343	31.841	20.249	2.677	1.090
82014	78.341	76.959	26.267	25.346	8.664	2.539	0.894
82020	99.515	102.913	35.437	34.466	12.976	3.306	0.869
82021	80.402	81.407	29.648	28.643	26.874	2.523	0.910
82025	85.366	84.390	33.659	30.244	15.624	2.566	0.868
82038	74.286	77.619	29.524	27.143	25.757	3.019	0.895
82041	77.295	78.744	33.333	29.469	14.449	2.551	0.928
MEAN	80.760	81.070	30.140	29.010	16.582	2.704	0.908
S.D.	7.7416	8.1284	2.8589	2.7785	5.7990	0.3487	0.0611
S.E.	2.2348	2.3465	0.8253	0.8021	1.6740	0.1006	0.0177
N	12	12	12	12	12	12	12

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 100 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81982	80.465	82.791	26.977	28.372	12.614	3.847	1.070
81987	78.218	78.713	31.683	30.198	10.223	2.252	0.926
81994	80.184	81.106	30.415	28.571	11.700	2.668	0.830
82001	78.873	79.343	30.047	29.577	21.197	3.319	0.887
82003	75.355	77.725	28.910	30.806	15.355	2.825	1.019
82007	80.995	80.995	27.602	27.602	23.511	3.113	0.914
82011	84.500	81.500	30.000	28.500	16.080	3.340	1.055
82016	69.585	71.429	30.415	29.032	12.396	2.839	0.968
82022	75.135	74.595	31.351	29.730	22.411	2.600	0.978
82024	93.204	94.660	28.641	29.612	10.893	2.932	1.029
82034	72.897	75.234	28.037	28.505	8.986	2.112	0.850
82046	69.903	68.447	27.184	23.786	15.068	2.951	0.932
MEAN	78.280	78.880	29.270	28.690	15.036	2.900	0.955
S.D.	6.5417	6.5935	1.6054	1.7838	4.9199	0.4774	0.0785
S.E.	1.8884	1.9034	0.4634	0.5149	1.4203	0.1378	0.0227
N	12	12	12	12	12	12	12

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 300 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81993	86.000	84.000	33.000	30.500	13.865	2.370	0.935
81995	94.118	92.647	31.373	33.824	12.265	3.093	0.927
82000	85.650	88.341	33.184	32.287	16.516	2.969	0.848
82002	85.650	83.857	31.839	30.942	12.870	3.511	0.785
82005	79.464	78.125	28.571	28.571	12.125	3.129	1.067
82013	88.942	89.423	33.654	34.615	11.731	2.572	0.923
82015	85.714	89.163	29.064	29.557	15.936	2.655	0.897
82023	88.442	87.437	34.673	33.166	20.206	2.764	0.900
82031	96.891	99.482	36.788	35.751	11.751	3.394	1.150
82036	90.047	101.896	30.332	32.701	16.474	2.645	0.957
82039	80.488	80.976	31.220	31.220	11.332	3.068	1.000
82044	74.408	74.882	28.910	26.540	16.427	2.943	1.114
MEAN	86.320	87.520	31.880	31.640	14.291	2.926	0.958
S.D.	6.1947	7.9754	2.5005	2.6307	2.7754	0.3393	0.1075
S.E.	1.7882	2.3023	0.7218	0.7594	0.8012	0.0979	0.0310
N	12	12	12	12	12	12	12

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 900 MG/KG

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
82006	88.235	85.784	30.882	28.431	16.652	3.525	0.931
82009	90.547	87.562	36.318	32.836	11.204	2.443	1.040
82010	78.109	80.597	30.846	30.348	11.642	3.070	1.090
82018	85.279	82.741	31.980	30.964	14.142	2.695	0.980
82028	96.651	98.086	35.407	35.407	10.201	2.962	1.143
82029	78.571	74.286	31.905	30.000	13.548	3.167	0.933
82030	82.500	79.000	31.000	31.000	19.195	2.960	0.965
82035	90.244	89.268	33.171	31.220	14.341	2.649	0.966
82037	74.490	76.020	34.694	32.143	10.617	2.398	1.168
82040	87.805	86.341	35.610	33.659	10.137	3.161	0.951
82042	72.906	73.399	26.108	24.138	18.887	2.980	1.035
82043	74.372	79.397	28.643	30.151	10.814	3.281	0.930
MEAN	83.310	82.710	32.210	30.860	13.448	2.941	1.011
S.D.	7.6447	7.1174	3.0292	2.8091	3.2880	0.3389	0.0840
S.E.	2.2068	2.0546	0.8744	0.8109	0.9492	0.0978	0.0242
N	12	12	12	12	12	12	12

TABLE A97 (F0 MALES - SCHEDULED NECROPSY)

PROJECT NO.:WIL-402011M ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 60 MG/KG CYC

ANIMAL	TESTIS, RT	TESTIS, LT	EPIDIDYMIS, RT	EPIDIDYMIS, LT	THYMUS	ADRENAL GLANDS	THYROIDS /PARATHY
81985	82.028	82.949	30.876	29.493	10.304	3.194	0.931
81992	95.567	95.567	33.005	31.527	10.365	3.005	0.970
82008	74.634	74.634	30.244	28.780	8.112	3.200	1.117
82026	84.404	82.110	31.651	31.193	6.115	3.564	1.298
82033	93.085	88.298	31.383	30.319	7.277	3.245	1.096
MEAN	85.940	84.710	31.430	30.260	8.434	3.241	1.082
S.D.	8.5031	7.7801	1.0303	1.1463	1.8740	0.2026	0.1444
S.E.	3.8027	3.4794	0.4608	0.5126	0.8381	0.0906	0.0646
N	5	5	5	5	5	5	5

POFBWv4.25
12/15/2010

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: SHAM CONTROL

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81924	310.	1.87	11.77	2.15	0.62	0.97
81940	377.	1.91	13.33	2.42	0.67	1.14
81944	332.	1.93	15.03	2.45	0.67	1.13
81952	333.	1.90	16.19	2.60	0.91	1.58
81963	323.	1.97	11.59	2.32	0.67	1.21
MEAN	335.	1.92	13.58	2.39	0.71	1.21
S.D.	25.2	0.037	2.013	0.167	0.115	0.227
S.E.	11.3	0.017	0.900	0.075	0.051	0.101
N	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81920	305.	2.05	10.51	2.19	0.59	1.01
81938	327.	2.06	13.95	2.27	0.63	1.20
81939	315.	1.89	11.87	2.08	0.59	1.04
81942	319.	1.76	12.80	1.99	0.52	1.04
81950	264.	1.90	9.32	1.64	0.54	0.99
81958	338.	1.98	13.60	2.13	0.57	1.20
81967	340.	1.93	11.22	2.12	0.58	1.24
81975	313.	1.85	11.61	2.14	0.56	1.16
81979	297.	1.96	10.76	2.08	0.54	1.06
MEAN	313.	1.93	11.74	2.07	0.57	1.10
S.D.	23.2	0.095	1.504	0.179	0.033	0.095
S.E.	7.7	0.032	0.501	0.060	0.011	0.032
N	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: 100 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81915	358.	1.99	13.18	2.40	0.59	1.16
81916	282.	1.92	11.23	2.03	0.58	1.10
81917	280.	1.88	11.95	1.96	0.53	0.96
81921	305.	2.00	12.09	2.05	0.68	1.13
81926	290.	1.91	13.24	1.99	0.72	0.98
81930	277.	1.95	11.31	1.92	0.49	0.90
81941	271.	1.97	10.67	1.99	0.44	1.02
81960	268.	2.01	10.43	2.09	0.44	1.05
81961	348.	2.06	13.79	2.22	0.51	1.24
81962	297.	1.97	11.64	2.18	0.57	1.07
81972	297.	1.95	11.96	2.11	0.73	1.16
81978	333.	2.08	13.37	2.33	0.60	1.20
MEAN	301.	1.97	12.07	2.11	0.57	1.08
S.D.	30.2	0.059	1.103	0.150	0.099	0.103
S.E.	8.7	0.017	0.319	0.043	0.028	0.030
N	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81914	302.	1.95	14.85	2.31	0.52	1.07
81931	262.	1.93	11.62	1.71	0.56	0.89
81934	316.	2.00	14.68	2.27	0.61	1.18
81943	297.	1.98	14.43	1.93	0.54	1.04
81946	257.	1.85	11.63	1.77	0.42	0.92
81957	275.	2.06	11.65	1.81	0.53	1.02
81959	309.	2.12	12.14	2.25	0.51	1.15
81974	277.	1.89	13.24	1.96	0.95	1.21
81976	305.	1.87	14.11	2.03	0.55	1.05
81977	327.	1.95	15.07	2.44	0.68	1.17
MEAN	293.	1.96	13.34	2.05	0.59	1.07
S.D.	23.6	0.084	1.454	0.254	0.144	0.109
S.E.	7.5	0.027	0.460	0.080	0.046	0.034
N	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 900 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81918	329.	2.12	21.75	2.53	0.63	1.22
81919	270.	1.90	15.76	1.97	0.45	0.88
81927	272.	1.86	16.22	1.98	0.45	0.90
81936	266.	1.89	15.56	2.05	0.52	0.91
81937	310.	1.89	20.02	2.13	0.59	1.09
81955	267.	1.90	16.38	2.06	0.50	0.92
81968	287.	1.94	18.59	2.47	0.49	0.96
81969	304.	1.85	19.74	2.17	0.65	1.05
81973	268.	1.98	14.99	2.17	0.58	0.92
81980	318.	1.88	20.12	2.14	0.44	1.21
MEAN	289.	1.92	17.91	2.17	0.53	1.01
S.D.	24.1	0.079	2.398	0.190	0.077	0.129
S.E.	7.6	0.025	0.758	0.060	0.024	0.041
N	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 60 MG/KG CYC

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81928	275.	1.80	10.92	1.99	0.37	0.87
81935	347.	2.05	12.32	2.35	0.49	1.21
81949	298.	1.85	11.04	2.03	0.46	0.96
81953	284.	1.87	11.17	2.07	0.43	1.02
81970	269.	1.85	10.88	2.05	0.49	1.11
MEAN	295.	1.88	11.27	2.10	0.45	1.03
S.D.	31.3	0.096	0.600	0.144	0.050	0.132
S.E.	14.0	0.043	0.268	0.064	0.022	0.059
N	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: SHAM CONTROL

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81924	1.16	1.22	0.1075	0.1373	0.0825	0.0128
81940	1.36	0.89	0.2206	0.1514	0.0705	0.0176
81944	1.39	0.88	0.1271	0.1402	0.0749	0.0171
81952	1.51	1.30	0.2139	0.1640	0.0761	0.0146
81963	1.38	1.04	0.2587	0.1748	0.0756	0.0208
MEAN	1.36	1.07	0.1856	0.1535	0.0759	0.0166
S.D.	0.126	0.190	0.06498	0.01587	0.00430	0.00305
S.E.	0.056	0.085	0.02906	0.00710	0.00192	0.00137
N	5	5	5	5	5	5

FEMALE GROUP: 0 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81920	1.30	0.98	0.1638	0.1604	0.0805	0.0193
81938	1.56	1.15	0.1660	0.1618	0.0685	0.0148
81939	1.32	0.80	0.1925	0.1440	0.0673	0.0161
81942	1.38	0.87	0.1995	0.1288	0.0726	0.0126
81950	1.23	0.81	0.1146	0.1156	0.0592	0.0146
81958	1.43	1.09	0.1847	0.1442	0.0729	0.0183
81967	1.43	1.10	0.1897	0.1453	0.0880	0.0154
81975	1.32	1.07	0.1855	0.1542	0.0927	0.0202
81979	1.64	1.16	0.1302	0.1476	0.0812	0.0136
MEAN	1.40	1.00	0.1696	0.1447	0.0759	0.0161
S.D.	0.131	0.143	0.02943	0.01474	0.01064	0.00262
S.E.	0.044	0.048	0.00981	0.00491	0.00355	0.00087
N	9	9	9	9	9	9

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: 100 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81915	1.32	0.92	0.2597	0.1495	0.0645	0.0160
81916	1.30	0.78	0.1800	0.1391	0.0756	0.0193
81917	1.08	0.99	0.0980	0.1221	0.0658	0.0151
81921	1.21	0.84	0.1880	0.1370	0.0776	0.0151
81926	1.24	0.76	0.1009	0.1336	0.0699	0.0149
81930	1.05	0.82	0.1918	0.1190	0.0817	0.0208
81941	1.18	0.85	0.1142	0.1403	0.0676	0.0168
81960	1.28	0.99	0.0777	0.1498	0.0742	0.0120
81961	1.41	0.81	0.1693	0.1349	0.0914	0.0170
81962	1.34	0.81	0.0990	0.1337	0.0648	0.0165
81972	1.21	0.90	0.2805	0.1573	0.0766	0.0167
81978	1.47	0.85	0.1753	0.1792	0.1031	0.0182
MEAN	1.26	0.86	0.1612	0.1413	0.0761	0.0165
S.D.	0.123	0.075	0.06529	0.01618	0.01160	0.00227
S.E.	0.036	0.022	0.01885	0.00467	0.00335	0.00065
N	12	12	12	12	12	12

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: 300 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81914	1.23	1.08	0.1241	0.1472	0.0803	0.0235
81931	0.98	0.72	0.1361	0.1179	0.0675	0.0142
81934	NA	0.87	0.1509	0.1507	0.0769	0.0198
81943	1.30	0.81	0.1438	0.1381	0.0740	0.0146
81946	1.04	0.74	0.0872	0.1378	0.0658	0.0124
81957	1.17	0.92	0.1008	0.1258	0.0695	0.0164
81959	1.23	0.95	0.1457	0.1633	0.0932	0.0166
81974	1.30	0.91	0.1580	0.1575	0.0771	0.0203
81976	1.27	0.77	0.1539	0.1473	0.0631	0.0142
81977	1.32	0.98	0.1885	0.1589	0.0762	0.0149
MEAN	1.20	0.88	0.1389	0.1445	0.0744	0.0167
S.D.	0.120	0.115	0.02909	0.01463	0.00868	0.00346
S.E.	0.040	0.036	0.00920	0.00463	0.00275	0.00109
N	9	10	10	10	10	10

NA = NOT APPLICABLE

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: 900 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81918	1.26	1.08	0.1239	0.1287	0.0934	0.0168
81919	1.13	0.70	0.1256	0.1152	0.0844	0.0184
81927	1.15	0.77	0.0693	0.1031	0.0649	0.0156
81936	1.19	0.91	0.0814	0.1275	0.0708	0.0162
81937	1.28	0.82	0.2071	0.1725	0.0634	0.0220
81955	1.11	0.86	0.1493	0.1338	0.0851	0.0210
81968	1.16	0.73	0.1247	0.1339	0.0971	0.0194
81969	1.26	0.77	0.0649	0.1297	0.0862	0.0191
81973	1.17	0.92	0.0769	0.1431	0.0716	0.0165
81980	1.32	0.97	0.1556	0.1438	0.1053	0.0197
MEAN	1.20	0.85	0.1179	0.1331	0.0822	0.0185
S.D.	0.071	0.119	0.04557	0.01841	0.01416	0.00215
S.E.	0.023	0.037	0.01441	0.00582	0.00448	0.00068
N	10	10	10	10	10	10

TABLE A98 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: 60 MG/KG CYC

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81928	1.21	0.89	0.0919	0.1326	0.0775	0.0159
81935	1.39	0.83	0.1746	0.1634	0.1023	0.0165
81949	1.28	1.08	0.1488	0.1408	0.0864	0.0206
81953	1.74	1.01	0.1988	0.1280	0.0886	0.0182
81970	2.16	1.11	0.1101	0.1333	0.0695	0.0143
MEAN	1.56	0.98	0.1448	0.1396	0.0849	0.0171
S.D.	0.394	0.121	0.04422	0.01406	0.01236	0.00240
S.E.	0.176	0.054	0.01978	0.00629	0.00553	0.00107
N	5	5	5	5	5	5

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: SHAM CONTROL

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81924	310.	0.603	3.797	0.694	0.200	0.313
81940	377.	0.507	3.536	0.642	0.178	0.302
81944	332.	0.581	4.527	0.738	0.202	0.340
81952	333.	0.571	4.862	0.781	0.273	0.474
81963	323.	0.610	3.588	0.718	0.207	0.375
MEAN	335.	0.570	4.060	0.710	0.210	0.360
S.D.	25.2	0.0411	0.5974	0.0516	0.0360	0.0693
S.E.	11.3	0.0184	0.2672	0.0231	0.0161	0.0310
N	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81920	305.	0.672	3.446	0.718	0.193	0.331
81938	327.	0.630	4.266	0.694	0.193	0.367
81939	315.	0.600	3.768	0.660	0.187	0.330
81942	319.	0.552	4.013	0.624	0.163	0.326
81950	264.	0.720	3.530	0.621	0.205	0.375
81958	338.	0.586	4.024	0.630	0.169	0.355
81967	340.	0.568	3.300	0.624	0.171	0.365
81975	313.	0.591	3.709	0.684	0.179	0.371
81979	297.	0.660	3.623	0.700	0.182	0.357
MEAN	313.	0.620	3.740	0.660	0.180	0.350
S.D.	23.2	0.0550	0.3104	0.0383	0.0135	0.0190
S.E.	7.7	0.0183	0.1035	0.0128	0.0045	0.0063
N	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 100 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81915	358.	0.556	3.682	0.670	0.165	0.324
81916	282.	0.681	3.982	0.720	0.206	0.390
81917	280.	0.671	4.268	0.700	0.189	0.343
81921	305.	0.656	3.964	0.672	0.223	0.370
81926	290.	0.659	4.566	0.686	0.248	0.338
81930	277.	0.704	4.083	0.693	0.177	0.325
81941	271.	0.727	3.937	0.734	0.162	0.376
81960	268.	0.750	3.892	0.780	0.164	0.392
81961	348.	0.592	3.963	0.638	0.147	0.356
81962	297.	0.663	3.919	0.734	0.192	0.360
81972	297.	0.657	4.027	0.710	0.246	0.391
81978	333.	0.625	4.015	0.700	0.180	0.360
MEAN	301.	0.660	4.020	0.700	0.190	0.360
S.D.	30.2	0.0538	0.2171	0.0367	0.0331	0.0244
S.E.	8.7	0.0155	0.0627	0.0106	0.0095	0.0070
N	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81914	302.	0.646	4.917	0.765	0.172	0.354
81931	262.	0.737	4.435	0.653	0.214	0.340
81934	316.	0.633	4.646	0.718	0.193	0.373
81943	297.	0.667	4.859	0.650	0.182	0.350
81946	257.	0.720	4.525	0.689	0.163	0.358
81957	275.	0.749	4.236	0.658	0.193	0.371
81959	309.	0.686	3.929	0.728	0.165	0.372
81974	277.	0.682	4.780	0.708	0.343	0.437
81976	305.	0.613	4.626	0.666	0.180	0.344
81977	327.	0.596	4.609	0.746	0.208	0.358
MEAN	293.	0.670	4.560	0.700	0.200	0.370
S.D.	23.6	0.0518	0.2979	0.0412	0.0525	0.0275
S.E.	7.5	0.0164	0.0942	0.0130	0.0166	0.0087
N	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 900 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81918	329.	0.644	6.611	0.769	0.191	0.371
81919	270.	0.704	5.837	0.730	0.167	0.326
81927	272.	0.684	5.963	0.728	0.165	0.331
81936	266.	0.711	5.850	0.771	0.195	0.342
81937	310.	0.610	6.458	0.687	0.190	0.352
81955	267.	0.712	6.135	0.772	0.187	0.345
81968	287.	0.676	6.477	0.861	0.171	0.334
81969	304.	0.609	6.493	0.714	0.214	0.345
81973	268.	0.739	5.593	0.810	0.216	0.343
81980	318.	0.591	6.327	0.673	0.138	0.381
MEAN	289.	0.670	6.170	0.750	0.180	0.350
S.D.	24.1	0.0513	0.3482	0.0569	0.0238	0.0171
S.E.	7.6	0.0162	0.1101	0.0180	0.0075	0.0054
N	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 60 MG/KG CYC

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81928	275.	0.655	3.971	0.724	0.135	0.316
81935	347.	0.591	3.550	0.677	0.141	0.349
81949	298.	0.621	3.705	0.681	0.154	0.322
81953	284.	0.658	3.933	0.729	0.151	0.359
81970	269.	0.688	4.045	0.762	0.182	0.413
MEAN	295.	0.640	3.840	0.710	0.150	0.350
S.D.	31.3	0.0374	0.2060	0.0355	0.0183	0.0384
S.E.	14.0	0.0167	0.0921	0.0159	0.0082	0.0172
N	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: SHAM CONTROL

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81924	0.374	0.394	0.035	0.044	0.027	0.004
81940	0.361	0.236	0.059	0.040	0.019	0.005
81944	0.419	0.265	0.038	0.042	0.023	0.005
81952	0.453	0.390	0.064	0.049	0.023	0.004
81963	0.427	0.322	0.080	0.054	0.023	0.006
MEAN	0.410	0.320	0.055	0.046	0.023	0.005
S.D.	0.0385	0.0714	0.0188	0.0057	0.0028	0.0009
S.E.	0.0172	0.0320	0.0084	0.0025	0.0013	0.0004
N	5	5	5	5	5	5

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 0 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81920	0.426	0.321	0.054	0.053	0.026	0.006
81938	0.477	0.352	0.051	0.049	0.021	0.004
81939	0.419	0.254	0.061	0.046	0.021	0.005
81942	0.433	0.273	0.063	0.040	0.023	0.004
81950	0.466	0.307	0.043	0.044	0.022	0.005
81958	0.423	0.322	0.055	0.043	0.022	0.005
81967	0.421	0.324	0.056	0.043	0.026	0.004
81975	0.422	0.342	0.059	0.049	0.030	0.007
81979	0.552	0.391	0.044	0.050	0.027	0.005
MEAN	0.450	0.320	0.054	0.046	0.024	0.005
S.D.	0.0442	0.0407	0.0069	0.0041	0.0031	0.0009
S.E.	0.0147	0.0136	0.0023	0.0014	0.0010	0.0003
N	9	9	9	9	9	9

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 100 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81915	0.369	0.257	0.073	0.042	0.018	0.004
81916	0.461	0.277	0.064	0.049	0.027	0.007
81917	0.386	0.354	0.035	0.044	0.024	0.005
81921	0.397	0.275	0.062	0.045	0.025	0.005
81926	0.428	0.262	0.035	0.046	0.024	0.005
81930	0.379	0.296	0.069	0.043	0.029	0.007
81941	0.435	0.314	0.042	0.052	0.025	0.006
81960	0.478	0.369	0.029	0.056	0.028	0.004
81961	0.405	0.233	0.049	0.039	0.026	0.005
81962	0.451	0.273	0.033	0.045	0.022	0.006
81972	0.407	0.303	0.094	0.053	0.026	0.006
81978	0.441	0.255	0.053	0.054	0.031	0.005
MEAN	0.420	0.290	0.053	0.047	0.025	0.006
S.D.	0.0345	0.0406	0.0198	0.0054	0.0034	0.0009
S.E.	0.0100	0.0117	0.0057	0.0016	0.0010	0.0003
N	12	12	12	12	12	12

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 300 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81914	0.407	0.358	0.041	0.049	0.027	0.008
81931	0.374	0.275	0.052	0.045	0.026	0.005
81934	NA	0.275	0.048	0.048	0.024	0.006
81943	0.438	0.273	0.048	0.046	0.025	0.005
81946	0.405	0.288	0.034	0.054	0.026	0.005
81957	0.425	0.335	0.037	0.046	0.025	0.006
81959	0.398	0.307	0.047	0.053	0.030	0.005
81974	0.469	0.329	0.057	0.057	0.028	0.007
81976	0.416	0.252	0.050	0.048	0.021	0.005
81977	0.404	0.300	0.058	0.049	0.023	0.005
MEAN	0.420	0.300	0.047	0.049	0.025	0.006
S.D.	0.0270	0.0329	0.0079	0.0038	0.0025	0.0011
S.E.	0.0090	0.0104	0.0025	0.0012	0.0008	0.0004
N	9	10	10	10	10	10

NA = NOT APPLICABLE

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: 900 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81918	0.383	0.328	0.038	0.039	0.028	0.005
81919	0.419	0.259	0.047	0.043	0.031	0.007
81927	0.423	0.283	0.025	0.038	0.024	0.006
81936	0.447	0.342	0.031	0.048	0.027	0.006
81937	0.413	0.265	0.067	0.056	0.020	0.007
81955	0.416	0.322	0.056	0.050	0.032	0.008
81968	0.404	0.254	0.043	0.047	0.034	0.007
81969	0.414	0.253	0.021	0.043	0.028	0.006
81973	0.437	0.343	0.029	0.053	0.027	0.006
81980	0.415	0.305	0.049	0.045	0.033	0.006
MEAN	0.420	0.300	0.041	0.046	0.028	0.006
S.D.	0.0173	0.0369	0.0145	0.0058	0.0042	0.0008
S.E.	0.0055	0.0117	0.0046	0.0018	0.0013	0.0002
N	10	10	10	10	10	10

TABLE A99 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 60 MG/KG CYC

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81928	0.440	0.324	0.033	0.048	0.028	0.006
81935	0.401	0.239	0.050	0.047	0.029	0.005
81949	0.430	0.362	0.050	0.047	0.029	0.007
81953	0.613	0.356	0.070	0.045	0.031	0.006
81970	0.803	0.413	0.041	0.050	0.026	0.005
MEAN	0.540	0.340	0.049	0.047	0.029	0.006
S.D.	0.1703	0.0641	0.0137	0.0016	0.0020	0.0008
S.E.	0.0762	0.0287	0.0061	0.0007	0.0009	0.0004
N	5	5	5	5	5	5

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: SHAM CONTROL

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81924	310.	1.87	629.412	114.973	33.155	51.872
81940	377.	1.91	697.906	126.702	35.079	59.686
81944	332.	1.93	778.757	126.943	34.715	58.549
81952	333.	1.90	852.105	136.842	47.895	83.158
81963	323.	1.97	588.325	117.766	34.010	61.421
MEAN	335.	1.92	709.300	124.650	36.970	62.940
S.D.	25.2	0.037	107.6621	8.6478	6.1507	11.8685
S.E.	11.3	0.017	48.1479	3.8674	2.7507	5.3078
N	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81920	305.	2.05	512.683	106.829	28.780	49.268
81938	327.	2.06	677.185	110.194	30.583	58.252
81939	315.	1.89	628.042	110.053	31.217	55.026
81942	319.	1.76	727.273	113.068	29.545	59.091
81950	264.	1.90	490.526	86.316	28.421	52.105
81958	338.	1.98	686.869	107.576	28.788	60.606
81967	340.	1.93	581.347	109.845	30.052	64.249
81975	313.	1.85	627.568	115.676	30.270	62.703
81979	297.	1.96	548.980	106.122	27.551	54.082
MEAN	313.	1.93	608.940	107.300	29.470	57.260
S.D.	23.2	0.095	81.4621	8.4252	1.1725	4.9941
S.E.	7.7	0.032	27.1540	2.8084	0.3908	1.6647
N	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 100 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81915	358.	1.99	662.312	120.603	29.648	58.291
81916	282.	1.92	584.896	105.729	30.208	57.292
81917	280.	1.88	635.638	104.255	28.191	51.064
81921	305.	2.00	604.500	102.500	34.000	56.500
81926	290.	1.91	693.194	104.188	37.696	51.309
81930	277.	1.95	580.000	98.462	25.128	46.154
81941	271.	1.97	541.624	101.015	22.335	51.777
81960	268.	2.01	518.906	103.980	21.891	52.239
81961	348.	2.06	669.418	107.767	24.757	60.194
81962	297.	1.97	590.863	110.660	28.934	54.315
81972	297.	1.95	613.333	108.205	37.436	59.487
81978	333.	2.08	642.789	112.019	28.846	57.692
MEAN	301.	1.97	611.460	106.620	29.090	54.690
S.D.	30.2	0.059	52.0545	5.8701	5.2416	4.2364
S.E.	8.7	0.017	15.0268	1.6946	1.5131	1.2230
N	12	12	12	12	12	12

FBW = FINAL BODY WEIGHT

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81914	302.	1.95	761.538	118.462	26.667	54.872
81931	262.	1.93	602.073	88.601	29.016	46.114
81934	316.	2.00	734.000	113.500	30.500	59.000
81943	297.	1.98	728.788	97.475	27.273	52.525
81946	257.	1.85	628.649	95.676	22.703	49.730
81957	275.	2.06	565.534	87.864	25.728	49.515
81959	309.	2.12	572.642	106.132	24.057	54.245
81974	277.	1.89	700.529	103.704	50.265	64.021
81976	305.	1.87	754.545	108.556	29.412	56.150
81977	327.	1.95	772.820	125.128	34.872	60.000
MEAN	293.	1.96	682.110	104.510	30.050	54.620
S.D.	23.6	0.084	81.5354	12.3736	7.8973	5.4342
S.E.	7.5	0.027	25.7837	3.9129	2.4973	1.7184
N	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 900 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81918	329.	2.12	1025.943	119.340	29.717	57.547
81919	270.	1.90	829.474	103.684	23.684	46.316
81927	272.	1.86	872.043	106.452	24.194	48.387
81936	266.	1.89	823.280	108.466	27.513	48.148
81937	310.	1.89	1059.259	112.698	31.217	57.672
81955	267.	1.90	862.105	108.421	26.316	48.421
81968	287.	1.94	958.247	127.320	25.258	49.485
81969	304.	1.85	1067.027	117.297	35.135	56.757
81973	268.	1.98	757.071	109.596	29.293	46.465
81980	318.	1.88	1070.213	113.830	23.404	64.362
MEAN	289.	1.92	932.470	112.710	27.570	52.360
S.D.	24.1	0.079	117.5935	7.0430	3.7843	6.2101
S.E.	7.6	0.025	37.1863	2.2272	1.1967	1.9638
N	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 60 MG/KG CYC

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81928	275.	1.80	606.667	110.556	20.556	48.333
81935	347.	2.05	600.976	114.634	23.902	59.024
81949	298.	1.85	596.757	109.730	24.865	51.892
81953	284.	1.87	597.326	110.695	22.995	54.545
81970	269.	1.85	588.108	110.811	26.486	60.000
MEAN	295.	1.88	597.970	111.290	23.760	54.760
S.D.	31.3	0.096	6.7786	1.9197	2.2096	4.8789
S.E.	14.0	0.043	3.0315	0.8585	0.9882	2.1819
N	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

FEMALE GROUP: SHAM CONTROL

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81924	62.032	65.241	5.749	7.342	4.412	0.684
81940	71.204	46.597	11.550	7.927	3.691	0.922
81944	72.021	45.596	6.585	7.264	3.881	0.886
81952	79.474	68.421	11.258	8.632	4.005	0.768
81963	70.051	52.792	13.132	8.873	3.838	1.056
MEAN	70.960	55.730	9.655	8.008	3.965	0.863
S.D.	6.2089	10.5625	3.2761	0.7315	0.2737	0.1431
S.E.	2.7767	4.7237	1.4651	0.3271	0.1224	0.0640
N	5	5	5	5	5	5

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 0 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81920	63.415	47.805	7.990	7.824	3.927	0.942
81938	75.728	55.825	8.058	7.854	3.325	0.718
81939	69.841	42.328	10.185	7.619	3.561	0.852
81942	78.409	49.432	11.335	7.318	4.125	0.716
81950	64.737	42.632	6.032	6.084	3.116	0.768
81958	72.222	55.051	9.328	7.283	3.682	0.924
81967	74.093	56.995	9.829	7.528	4.560	0.798
81975	71.351	57.838	10.027	8.335	5.011	1.092
81979	83.673	59.184	6.643	7.531	4.143	0.694
MEAN	72.610	51.900	8.825	7.486	3.939	0.834
S.D.	6.3629	6.5191	1.7574	0.6151	0.5993	0.1318
S.E.	2.1210	2.1730	0.5858	0.2050	0.1998	0.0439
N	9	9	9	9	9	9

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 100 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81915	66.332	46.231	13.050	7.513	3.241	0.804
81916	67.708	40.625	9.375	7.245	3.938	1.005
81917	57.447	52.660	5.213	6.495	3.500	0.803
81921	60.500	42.000	9.400	6.850	3.880	0.755
81926	64.921	39.791	5.283	6.995	3.660	0.780
81930	53.846	42.051	9.836	6.103	4.190	1.067
81941	59.898	43.147	5.797	7.122	3.431	0.853
81960	63.682	49.254	3.866	7.453	3.692	0.597
81961	68.447	39.320	8.218	6.549	4.437	0.825
81962	68.020	41.117	5.025	6.787	3.289	0.838
81972	62.051	46.154	14.385	8.067	3.928	0.856
81978	70.673	40.865	8.428	8.615	4.957	0.875
MEAN	63.630	43.600	8.156	7.149	3.845	0.838
S.D.	5.0259	4.1338	3.2943	0.6977	0.4994	0.1180
S.E.	1.4508	1.1933	0.9510	0.2014	0.1442	0.0340
N	12	12	12	12	12	12

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 300 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81914	63.077	55.385	6.364	7.549	4.118	1.205
81931	50.777	37.306	7.052	6.109	3.497	0.736
81934	NA	43.500	7.545	7.535	3.845	0.990
81943	65.657	40.909	7.263	6.975	3.737	0.737
81946	56.216	40.000	4.714	7.449	3.557	0.670
81957	56.796	44.660	4.893	6.107	3.374	0.796
81959	58.019	44.811	6.873	7.703	4.396	0.783
81974	68.783	48.148	8.360	8.333	4.079	1.074
81976	67.914	41.176	8.230	7.877	3.374	0.759
81977	67.692	50.256	9.667	8.149	3.908	0.764
MEAN	61.660	44.620	7.096	7.378	3.789	0.851
S.D.	6.4149	5.3940	1.5216	0.7681	0.3439	0.1754
S.E.	2.1383	1.7057	0.4812	0.2429	0.1088	0.0555
N	9	10	10	10	10	10

NA = NOT APPLICABLE

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 900 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81918	59.434	50.943	5.844	6.071	4.406	0.793
81919	59.474	36.842	6.611	6.063	4.442	0.968
81927	61.828	41.398	3.726	5.543	3.489	0.839
81936	62.963	48.148	4.307	6.746	3.746	0.857
81937	67.725	43.386	10.958	9.127	3.354	1.164
81955	58.421	45.263	7.858	7.042	4.479	1.105
81968	59.794	37.629	6.428	6.902	5.005	1.000
81969	68.108	41.622	3.508	7.011	4.659	1.032
81973	59.091	46.465	3.884	7.227	3.616	0.833
81980	70.213	51.596	8.277	7.649	5.601	1.048
MEAN	62.710	44.330	6.140	6.938	4.280	0.964
S.D.	4.3796	5.1026	2.4112	0.9943	0.7230	0.1276
S.E.	1.3849	1.6136	0.7625	0.3144	0.2286	0.0404
N	10	10	10	10	10	10

TABLE A100 (F0 FEMALES - LACTATION DAY 4)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 60 MG/KG CYC

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81928	67.222	49.444	5.106	7.367	4.306	0.883
81935	67.805	40.488	8.517	7.971	4.990	0.805
81949	69.189	58.378	8.043	7.611	4.670	1.113
81953	93.048	54.011	10.631	6.845	4.738	0.973
81970	116.757	60.000	5.951	7.205	3.757	0.773
MEAN	82.800	52.460	7.650	7.400	4.492	0.910
S.D.	21.8567	7.8535	2.1882	0.4235	0.4785	0.1378
S.E.	9.7746	3.5122	0.9786	0.1894	0.2140	0.0616
N	5	5	5	5	5	5

POFBWv4.25
12/15/2010

TABLE A101 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81932	269.	1.83	8.88	1.87	0.42	1.09
81966	307.	1.89	9.75	1.88	0.54	1.06
81971	281.	2.03	11.24	2.04	0.65	1.07
MEAN	286.	1.92	9.96	1.93	0.54	1.07
S.D.	19.4	0.103	1.193	0.095	0.115	0.015
S.E.	11.2	0.059	0.689	0.055	0.066	0.009
N	3	3	3	3	3	3

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81945	262.	1.87	10.47	1.69	0.50	0.92
81947	306.	1.95	13.56	2.28	0.61	1.19
MEAN	284.	1.91	12.02	1.99	0.56	1.06
S.D.	31.1	0.057	2.185	0.417	0.078	0.191
S.E.	22.0	0.040	1.545	0.295	0.055	0.135
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 0 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81932	1.37	1.88	0.2880	0.1438	0.0666	0.0134
81966	1.19	0.78	0.4101	0.1244	0.0664	0.0210
81971	1.22	0.73	0.2304	0.1757	0.0626	0.0179
MEAN	1.26	1.13	0.3095	0.1480	0.0652	0.0174
S.D.	0.096	0.650	0.09176	0.02590	0.00225	0.00382
S.E.	0.056	0.375	0.05298	0.01495	0.00130	0.00221
N	3	3	3	3	3	3

FEMALE GROUP: 300 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81945	1.12	1.39	0.1268	0.1401	0.0725	0.0155
81947	1.43	1.37	0.3557	0.1254	0.0695	0.0159
MEAN	1.28	1.38	0.2413	0.1328	0.0710	0.0157
S.D.	0.219	0.014	0.16186	0.01039	0.00212	0.00028
S.E.	0.155	0.010	0.11445	0.00735	0.00150	0.00020
N	2	2	2	2	2	2

POFBWv4.25
12/15/2010

TABLE A102 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81932	269.	0.680	3.301	0.695	0.156	0.405
81966	307.	0.616	3.176	0.612	0.176	0.345
81971	281.	0.722	4.000	0.726	0.231	0.381
MEAN	286.	0.670	3.490	0.680	0.190	0.380
S.D.	19.4	0.0538	0.4441	0.0587	0.0390	0.0301
S.E.	11.2	0.0311	0.2564	0.0339	0.0225	0.0174
N	3	3	3	3	3	3

FBW = FINAL BODY WEIGHT

TABLE A102 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
81945	262.	0.714	3.996	0.645	0.191	0.351
81947	306.	0.637	4.431	0.745	0.199	0.389
MEAN	284.	0.680	4.210	0.700	0.200	0.370
S.D.	31.1	0.0541	0.3077	0.0708	0.0060	0.0267
S.E.	22.0	0.0382	0.2176	0.0500	0.0043	0.0189
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A102 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 0 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81932	0.509	0.699	0.107	0.053	0.025	0.005
81966	0.388	0.254	0.134	0.041	0.022	0.007
81971	0.434	0.260	0.082	0.063	0.022	0.006
MEAN	0.440	0.400	0.108	0.052	0.023	0.006
S.D.	0.0614	0.2552	0.0258	0.0111	0.0017	0.0009
S.E.	0.0354	0.1473	0.0149	0.0064	0.0010	0.0005
N	3	3	3	3	3	3

TABLE A102 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 300 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81945	0.427	0.531	0.048	0.053	0.028	0.006
81947	0.467	0.448	0.116	0.041	0.023	0.005
MEAN	0.450	0.490	0.082	0.047	0.025	0.006
S.D.	0.0282	0.0586	0.0480	0.0088	0.0035	0.0005
S.E.	0.0199	0.0414	0.0339	0.0062	0.0025	0.0004
N	2	2	2	2	2	2

POFBWv4.25
12/15/2010

TABLE A103 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 0 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81932	269.	1.83	485.246	102.186	22.951	59.563
81966	307.	1.89	515.873	99.471	28.571	56.085
81971	281.	2.03	553.695	100.493	32.020	52.709
MEAN	286.	1.92	518.270	100.720	27.850	56.120
S.D.	19.4	0.103	34.2873	1.3711	4.5776	3.4269
S.E.	11.2	0.059	19.7958	0.7916	2.6429	1.9785
N	3	3	3	3	3	3

FBW = FINAL BODY WEIGHT

TABLE A103 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 300 MG/KG

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
81945	262.	1.87	559.893	90.374	26.738	49.198
81947	306.	1.95	695.385	116.923	31.282	61.026
MEAN	284.	1.91	627.640	103.650	29.010	55.110
S.D.	31.1	0.057	95.8071	18.7728	3.2131	8.3635
S.E.	22.0	0.040	67.7458	13.2744	2.2720	5.9139
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A103 (F0 FEMALES - FAILED TO DELIVER)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 0 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81932	74.863	102.732	15.738	7.858	3.639	0.732
81966	62.963	41.270	21.698	6.582	3.513	1.111
81971	60.099	35.961	11.350	8.655	3.084	0.882
MEAN	65.970	59.990	16.262	7.698	3.412	0.908
S.D.	7.8297	37.1130	5.1942	1.0458	0.2913	0.1908
S.E.	4.5205	21.4272	2.9989	0.6038	0.1682	0.1102
N	3	3	3	3	3	3

FEMALE GROUP: 300 MG/KG

ANIMAL	LUNGS	UTERUS /VAGINA	THYMUS	OVARIES/ OVIDUCTS	ADRENAL GLANDS	THYROIDS /PARATHY
81945	59.893	74.332	6.781	7.492	3.877	0.829
81947	73.333	70.256	18.241	6.431	3.564	0.815
MEAN	66.610	72.290	12.511	6.961	3.721	0.822
S.D.	9.5037	2.8815	8.1036	0.7504	0.2213	0.0095
S.E.	6.7201	2.0375	5.7301	0.5306	0.1565	0.0068
N	2	2	2	2	2	2

POFBWv4.25
12/15/2010

TABLE A104 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL LITTER VIABILITY

GROUP: SHAM CONTROL

DAM #	PND	0	1	2	3	4
81924	ALIVE	15	15	15	15	0
	SCHED. EUTH.					15
81940	ALIVE	13	13	13	13	0
	SCHED. EUTH.					13
81944	ALIVE	12	12	12	12	0
	DEAD	2				
	SCHED. EUTH.					12
81952	ALIVE	16	16	12	12	0
	SCHED. EUTH.					12
	MISSING			4		
81963	ALIVE	15	15	11	10	0
	DEAD; CANN.			1		
	DEAD			2		1
	SCHED. EUTH.					9
	MISSING			1	1	

DEAD; CANN.= FOUND DEAD; PARTIALLY CANNIBALIZED, DEAD= FOUND DEAD, SCHED. EUTH.= SCHEDULED EUTHANASIA

GROUP: 0 MG/KG

DAM #		PND	0	1	2	3	4
81920	ALIVE		13	13	13	13	0
	SCHED. EUTH.						13
81938	ALIVE		15	15	15	15	0
	SCHED. EUTH.						15
81939	ALIVE		14	14	14	14	0
	SCHED. EUTH.						14
81942	ALIVE		15	15	15	15	0
	SCHED. EUTH.						15
81950	ALIVE		10	9	9	9	0
	SCHED. EUTH.						9
	MISSING			1			
81958	ALIVE		16	16	16	16	0
	SCHED. EUTH.						16
81967	ALIVE		16	16	16	16	0
	SCHED. EUTH.						16
81975	ALIVE		13	13	13	13	0
	SCHED. EUTH.						13
81979	ALIVE		14	14	14	14	0
	DEAD		1				
	SCHED. EUTH.						14

DEAD= FOUND DEAD, SCHED. EUTH.= SCHEDULED EUTHANASIA

GROUP: 100 MG/KG

DAM #		PND	0	1	2	3	4
81915	ALIVE		12	12	12	12	0
	SCHED. EUTH.						12
81916	ALIVE		11	11	11	11	0
	SCHED. EUTH.						11
81917	ALIVE		13	13	13	13	0
	SCHED. EUTH.						13
81921	ALIVE		13	13	13	13	0
	SCHED. EUTH.						13
81926	ALIVE		12	12	12	12	0
	SCHED. EUTH.						12
81930	ALIVE		12	12	12	12	0
	SCHED. EUTH.						12
81941	ALIVE		13	13	13	13	0
	SCHED. EUTH.						13
81960	ALIVE		15	15	15	15	0
	SCHED. EUTH.						15
81961	ALIVE		14	14	14	14	0
	SCHED. EUTH.						14
81962	ALIVE		14	14	14	14	0
	SCHED. EUTH.						14
81972	ALIVE		13	13	13	13	0
	SCHED. EUTH.						13
81978	ALIVE		13	13	13	13	0
	SCHED. EUTH.						13

SCHED. EUTH.= SCHEDULED EUTHANASIA

GROUP: 300 MG/KG

DAM #	PND	0	1	2	3	4
81914	ALIVE	15	15	15	14	0
	DEAD				1	
	SCHED. EUTH.					14
81931	ALIVE	12	11	11	11	0
	EUTH EXT.; CANN.	1				
	SCHED. EUTH.					11
	MISSING		1			
81934	ALIVE	11	11	11	11	0
	SCHED. EUTH.					11
81943	ALIVE	12	12	12	12	0
	SCHED. EUTH.					12
81946	ALIVE	12	12	12	12	0
	SCHED. EUTH.					12
81957	ALIVE	9	9	9	9	0
	DEAD	1				
	SCHED. EUTH.					9
81959	ALIVE	13	13	13	13	0
	DEAD					1
	SCHED. EUTH.					12
81974	ALIVE	2	2	2	2	0
	DEAD; CANN.	3				
	DEAD	5				
	SCHED. EUTH.					2
81976	ALIVE	13	13	13	13	0
	SCHED. EUTH.					13
81977	ALIVE	11	11	11	11	0
	SCHED. EUTH.					11

DEAD; CANN.= FOUND DEAD; PARTIALLY CANNIBALIZED, DEAD= FOUND DEAD
EUTH EXT.; CANN.= EUTHANIZED IN EXTREMIS; PARTIALLY CANNIBALIZED, SCHED. EUTH.= SCHEDULED EUTHANASIA

TABLE A104 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL LITTER VIABILITY

GROUP: 900 MG/KG

DAM #	PND	0	1	2	3	4
81918	ALIVE	16	13	13	13	0
	DEAD		2			
	SCHED. EUTH.					13
	MISSING		1			
81919	ALIVE	9	9	9	9	0
	SCHED. EUTH.					9
81927	ALIVE	9	9	9	9	0
	SCHED. EUTH.					9
81936	ALIVE	14	14	14	14	0
	SCHED. EUTH.					14
81937	ALIVE	1	1	1	1	0
	SCHED. EUTH.					1
81951	ALIVE	3	0 TOTAL LITTER LOSS			
	DEAD; CANN.	4				
	DEAD	4				
	MISSING		3			
81955	ALIVE	10	9	9	9	0
	DEAD		1			
	SCHED. EUTH.					9
81964	ALIVE	11	9	0 TOTAL LITTER LOSS		
	DEAD	3	2	9		
81968	ALIVE	10	3	3	1	0
	DEAD	2	7			
	SCHED. EUTH.					1
	MISSING			2		

DEAD; CANN.= FOUND DEAD; PARTIALLY CANNIBALIZED, DEAD= FOUND DEAD, SCHED. EUTH.= SCHEDULED EUTHANASIA

TABLE A104 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL LITTER VIABILITY

GROUP: 900 MG/KG

DAM #	PND	0	1	2	3	4
81969	ALIVE	11	11	11	11	0
	DEAD	1				
	SCHED. EUTH.					11
81973	ALIVE	9	8	8	7	0
	DEAD		1			
	SCHED. EUTH.					6
	MISSING				1	1
81980	ALIVE	12	9	9	9	0
	DEAD; CANN.		1			
	DEAD		1			
	SCHED. EUTH.					9
	MISSING		1			

DEAD; CANN.= FOUND DEAD; PARTIALLY CANNIBALIZED, DEAD= FOUND DEAD, SCHED. EUTH.= SCHEDULED EUTHANASIA

GROUP: 60 MG/KG CYC

DAM #	PND	0	1	2	3	4
81928	ALIVE	13	13	13	13	0
	SCHED. EUTH.					13
81935	ALIVE	12	12	12	12	0
	SCHED. EUTH.					12
81949	ALIVE	11	11	11	11	0
	SCHED. EUTH.					11
81953	ALIVE	13	13	13	13	0
	SCHED. EUTH.					13
81970	ALIVE	13	13	13	13	0
	SCHED. EUTH.					13

SCHED. EUTH.= SCHEDULED EUTHANASIA

TABLE A105 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP VIABILITY

LITTERS FROM GROUP 1: SHAM CONTROL

DAM #	DAY OF BIRTH	PUP # 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81924	29-OCT-10	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	
		M	M	M	M	M	M	M	M	M	F	F	F	F	F	F	
81940	31-OCT-10	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
		M	M	M	M	M	M	M	F	F	F	F	F	F			
81944	01-NOV-10	e0	e0	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4		
		M	F	M	M	M	M	M	M	M	M	F	F	F	F		
81952	29-OCT-10	m4	m4	m4	m4	s2	m4	m4	m4	s2	m4	m4	m4	m4	m4	s2	s2
		M	M	M	M	M	M	M	M	M	M	M	F	F	F	F	F
81963	30-OCT-10	m4	a2	m4	m4	s2	s3	m4	e2	m4	m4	m4	e4	e2	m4	m4	
		M	M	M	M	M	M	M	M	F	F	F	F	F	F	F	

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
a = FOUND DEAD; PARTIALLY CANNIBALIZED, e = FOUND DEAD, m = SCHEDULED EUTHANASIA, s = MISSING

TABLE A105 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP VIABILITY

LITTERS FROM GROUP 2: 0 MG/KG

DAM #	DAY OF BIRTH	PUP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81920	30-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	M	M	F	F	F	F	F	F			
81938	30-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	
			M	M	M	M	M	M	M	M	F	F	F	F	F	F	F	
81939	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4		
			M	M	M	M	M	M	M	M	M	F	F	F	F	F		
81942	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	
			M	M	M	M	M	M	M	M	M	F	F	F	F	F	F	
81950	30-OCT-10		s1	m4	m4	m4	m4	m4	m4	m4	m4	m4						
			M	M	M	M	M	M	M	F	F	F						
81958	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4
			M	M	M	M	M	M	M	M	F	F	F	F	F	F	F	F
81967	30-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4
			M	M	M	M	M	M	M	F	F	F	F	F	F	F	F	F
81975	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	M	M	M	F	F	F	F	F			
81979	29-OCT-10		e0	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	
			M	M	M	M	M	M	M	M	M	M	M	F	F	F	F	

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
e = FOUND DEAD, m = SCHEDULED EUTHANASIA, s = MISSING

LITTERS FROM GROUP 3: 100 MG/KG

DAM #	DAY OF BIRTH	PUP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81915	31-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	M	M	M	M	F	F	F	F				
81916	30-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4					
			M	M	M	M	M	M	F	F	F	F	F					
81917	31-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	M	M	M	F	F	F	F	F			
81921	01-NOV-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	M	M	M	M	F	F	F	F			
81926	01-NOV-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	M	M	M	F	F	F	F	F				
81930	28-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	M	M	F	F	F	F	F	F				
81941	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	F	F	F	F	F	F	F	F			
81960	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	
			M	M	M	M	M	M	F	F	F	F	F	F	F	F	F	
81961	31-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4		
			M	M	M	M	M	M	F	F	F	F	F	F	F	F		

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
m = SCHEDULED EUTHANASIA

TABLE A105 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP VIABILITY

LITTERS FROM GROUP 3: 100 MG/KG

DAM #	DAY OF BIRTH	PUP # 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81962	30-OCT-10	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4		
		M	M	M	M	M	M	M	F	F	F	F	F	F	F		
81972	30-OCT-10	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
		M	M	M	M	M	M	M	F	F	F	F	F	F			
81978	29-OCT-10	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
		M	M	M	M	M	M	M	M	F	F	F	F	F			

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
m = SCHEDULED EUTHANASIA

TABLE A105 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP VIABILITY

LITTERS FROM GROUP 4: 300 MG/KG

DAM #	DAY OF BIRTH	PUP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81914	09-NOV-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	e3	m4	m4	
			M	M	M	M	M	M	M	M	F	F	F	F	F	F	F	
81931	31-OCT-10		f0	s1	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	F	M	M	M	M	F	F	F	F	F	F	F			
81934	31-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4					
			M	M	M	M	M	M	F	F	F	F	F					
81943	31-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	M	M	F	F	F	F	F	F				
81946	31-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	M	M	M	M	M	M	F	F				
81957	02-NOV-10		e0	m4	m4	m4	m4	m4	m4	m4	m4	m4						
			M	M	M	M	M	M	M	F	M	F						
81959	30-OCT-10		m4	m4	m4	m4	m4	m4	m4	e4	m4	m4	m4	m4	m4			
			M	M	M	M	M	F	F	F	F	F	F	F	F			
81974	30-OCT-10		e0	e0	e0	e0	a0	e0	a0	a0	m4	m4						
			M	M	F	F	F	F	U	U	M	M						
81976	02-NOV-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	M	M	M	M	M	F	F	F			

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
a = FOUND DEAD; PARTIALLY CANNIBALIZED, e = FOUND DEAD, f = EUTHANIZED IN EXTREMIS; PARTIALLY CANNIBALIZED
m = SCHEDULED EUTHANASIA, s = MISSING

TABLE A105 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP VIABILITY

LITTERS FROM GROUP 4: 300 MG/KG

DAM #	DAY OF BIRTH	PUP # 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81977	01-NOV-10	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4					
		M	M	M	F	F	F	F	F	F	F	F					

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
m = SCHEDULED EUTHANASIA

TABLE A105 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP VIABILITY

LITTERS FROM GROUP 5: 900 MG/KG

DAM #	DAY OF BIRTH	PUP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81918	01-NOV-10		e1	m4	m4	s1	m4	m4	e1	m4	m4	m4	m4	m4	m4	m4	m4	m4
			M	M	M	M	M	M	M	M	M	F	F	F	F	F	F	F
81919	01-NOV-10		m4	m4	m4	m4	m4	m4	m4	m4	m4							
			M	M	M	M	M	M	M	M	F							
81927	11-NOV-10		m4	m4	m4	m4	m4	m4	m4	m4	m4							
			M	M	M	M	M	M	F	F	F							
81936	31-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4		
			M	M	M	M	M	M	M	M	F	F	F	F	F	F		
81937	31-OCT-10		m4															
			F															
81951	30-OCT-10		a0	e0	a0	e0	e0	a0	e0	a0	s1	s1	s1					
			M	F	F	F	F	F	F	U	M	M	F					
81955	29-OCT-10		m4	m4	m4	m4	m4	e1	m4	m4	m4	m4						
			M	M	M	M	M	M	F	F	F	F						
81964	01-NOV-10		e0	e0	e0	e2	e2	e2	e2	e1	e2	e1	e2	e2	e2	e2		
			M	F	F	M	M	M	M	M	M	M	M	M	F	F		
81968	31-OCT-10		e0	e0	e1	e1	e1	s3	s3	m4	e1	e1	e1	e1				
			M	F	M	M	M	M	M	M	M	F	F	F				

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
a = FOUND DEAD; PARTIALLY CANNIBALIZED, e = FOUND DEAD, m = SCHEDULED EUTHANASIA, s = MISSING

LITTERS FROM GROUP 5: 900 MG/KG

DAM #	DAY OF BIRTH	PUP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81969	30-OCT-10		e0	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	M	M	M	M	F	F	F	F				
81973	30-OCT-10		e1	s3	m4	m4	m4	m4	s4	m4	m4							
			M	M	M	M	M	M	F	F	F							
81980	02-NOV-10		e1	s1	m4	m4	a1	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	M	M	M	F	M	F	F	F				

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
a = FOUND DEAD; PARTIALLY CANNIBALIZED, e = FOUND DEAD, m = SCHEDULED EUTHANASIA, s = MISSING

LITTERS FROM GROUP 6: 60 MG/KG CYC

DAM #	DAY OF BIRTH	PUP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
81928	28-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	M	M	M	M	M	F	F	F			
81935	30-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4				
			M	M	M	M	F	F	F	F	F	F	F	F				
81949	30-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4					
			M	M	M	M	M	F	F	F	F	F	F					
81953	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	M	M	F	F	F	F	F	F			
81970	29-OCT-10		m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4	m4			
			M	M	M	M	M	F	F	F	F	F	F	F	F			

A = ALIVE, NUMBER INDICATES POSTNATAL DAY WHEN DEATH OCCURRED, C = CULLED DAY 4, M = MALE, F = FEMALE, U = UNDETERMINED
m = SCHEDULED EUTHANASIA

TABLE A106 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL POSTNATAL SURVIVAL (% PER LITTER)

LITTERS FROM GROUP 1: SHAM CONTROL

ANIMAL	B	0- 1	1- 4	B- 4
81924	100.0	100.0	100.0	100.0
81940	100.0	100.0	100.0	100.0
81944	85.7	100.0	100.0	85.7
81952	100.0	100.0	75.0	75.0
81963	100.0	100.0	60.0	60.0
MEAN	97.1	100.0	87.0	84.1
S.D.	6.39	0.00	18.57	17.12
S.E.	2.86	0.00	8.31	7.65
N	5	5	5	5

B= BIRTH

TABLE A106 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL POSTNATAL SURVIVAL (% PER LITTER)

LITTERS FROM GROUP 2: 0 MG/KG

ANIMAL	B	0- 1	1- 4	B- 4
81920	100.0	100.0	100.0	100.0
81938	100.0	100.0	100.0	100.0
81939	100.0	100.0	100.0	100.0
81942	100.0	100.0	100.0	100.0
81950	100.0	90.0	100.0	90.0
81958	100.0	100.0	100.0	100.0
81967	100.0	100.0	100.0	100.0
81975	100.0	100.0	100.0	100.0
81979	93.3	100.0	100.0	93.3
MEAN	99.3	98.9	100.0	98.1
S.D.	2.22	3.33	0.00	3.77
S.E.	0.74	1.11	0.00	1.26
N	9	9	9	9

B= BIRTH

LITTERS FROM GROUP 3: 100 MG/KG

ANIMAL	B	0- 1	1- 4	B- 4
81915	100.0	100.0	100.0	100.0
81916	100.0	100.0	100.0	100.0
81917	100.0	100.0	100.0	100.0
81921	100.0	100.0	100.0	100.0
81926	100.0	100.0	100.0	100.0
81930	100.0	100.0	100.0	100.0
81941	100.0	100.0	100.0	100.0
81960	100.0	100.0	100.0	100.0
81961	100.0	100.0	100.0	100.0
81962	100.0	100.0	100.0	100.0
81972	100.0	100.0	100.0	100.0
81978	100.0	100.0	100.0	100.0
MEAN	100.0	100.0	100.0	100.0
S.D.	0.00	0.00	0.00	0.00
S.E.	0.00	0.00	0.00	0.00
N	12	12	12	12

B= BIRTH

LITTERS FROM GROUP 4: 300 MG/KG

ANIMAL	B	0- 1	1- 4	B- 4
81914	100.0	100.0	93.3	93.3
81931	92.3	91.7	100.0	84.6
81934	100.0	100.0	100.0	100.0
81943	100.0	100.0	100.0	100.0
81946	100.0	100.0	100.0	100.0
81957	90.0	100.0	100.0	90.0
81959	100.0	100.0	92.3	92.3
81974	20.0	100.0	100.0	20.0
81976	100.0	100.0	100.0	100.0
81977	100.0	100.0	100.0	100.0
MEAN	90.2	99.2	98.6	88.0
S.D.	24.96	2.64	3.04	24.51
S.E.	7.89	0.83	0.96	7.75
N	10	10	10	10

B= BIRTH

LITTERS FROM GROUP 5: 900 MG/KG

ANIMAL	B	0- 1	1- 4	B- 4
81918	100.0	81.3	100.0	81.3
81919	100.0	100.0	100.0	100.0
81927	100.0	100.0	100.0	100.0
81936	100.0	100.0	100.0	100.0
81937	100.0	100.0	100.0	100.0
81951	27.3	0.0		0.0
81955	100.0	90.0	100.0	90.0
81964	78.6	81.8	0.0	0.0
81968	83.3	30.0	33.3	8.3
81969	91.7	100.0	100.0	91.7
81973	100.0	88.9	75.0	66.7
81980	100.0	75.0	100.0	75.0
MEAN	90.1	78.9	82.6	67.7
S.D.	21.13	31.76	34.25	40.65
S.E.	6.10	9.17	10.33	11.73
N	12	12	11	12

B= BIRTH

LITTERS FROM GROUP 6: 60 MG/KG CYC

ANIMAL	B	0- 1	1- 4	B- 4
81928	100.0	100.0	100.0	100.0
81935	100.0	100.0	100.0	100.0
81949	100.0	100.0	100.0	100.0
81953	100.0	100.0	100.0	100.0
81970	100.0	100.0	100.0	100.0
MEAN	100.0	100.0	100.0	100.0
S.D.	0.00	0.00	0.00	0.00
S.E.	0.00	0.00	0.00	0.00
N	5	5	5	5

B= BIRTH

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81924-01	M	SHAM CONTROL	NORMAL	1	10/30/10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-01	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:26	P	SCHEDULED EUTHANASIA
81924-02	M	SHAM CONTROL	NORMAL	1	10/30/10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-02	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:26	P	SCHEDULED EUTHANASIA
81924-03	M	SHAM CONTROL	NORMAL	1	10/30/10	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-03	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:26	P	SCHEDULED EUTHANASIA
81924-04	M	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-04	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:26	P	SCHEDULED EUTHANASIA
81924-05	M	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-05	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:27	P	SCHEDULED EUTHANASIA
81924-06	M	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-06	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:27	P	SCHEDULED EUTHANASIA
81924-07	M	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-07	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:27	P	SCHEDULED EUTHANASIA
81924-08	M	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-08	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:27	P	SCHEDULED EUTHANASIA
81924-09	M	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-09	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:27	P	SCHEDULED EUTHANASIA
81924-10	F	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-10	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:27	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81924-11	F	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-11	F	SHAM CONTROL	DISPOSITION	4	11/02/10	10:02	P	SCHEDULED EUTHANASIA
81924-12	F	SHAM CONTROL	NORMAL	1	10/30/10	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-12	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:28	P	SCHEDULED EUTHANASIA
81924-13	F	SHAM CONTROL	NORMAL	1	10/30/10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-13	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:28	P	SCHEDULED EUTHANASIA
81924-14	F	SHAM CONTROL	NORMAL	1	10/30/10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-14	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:28	P	SCHEDULED EUTHANASIA
81924-15	F	SHAM CONTROL	NORMAL	1	10/30/10	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81924-15	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:28	P	SCHEDULED EUTHANASIA
81940-01	M	SHAM CONTROL	NORMAL	1	11/01/10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-01	M	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-02	M	SHAM CONTROL	NORMAL	1	11/01/10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-02	M	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-03	M	SHAM CONTROL	NORMAL	1	11/01/10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-03	M	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-04	M	SHAM CONTROL	NORMAL	1	11/01/10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-04	M	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-05	M	SHAM CONTROL	NORMAL	1	11/01/10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 3

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81940-05	M	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-06	M	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-06	M	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-06	M	SHAM CONTROL	BODY/INTEGUMENT	4	11/04/10	7:30	P	SUBCUTANEOUS HEMORRHAGE DORSAL HEAD
81940-07	M	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-07	M	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-08	F	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-08	F	SHAM CONTROL	DISPOSITION	4	11/04/10	8:08	P	SCHEDULED EUTHANASIA
81940-09	F	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-09	F	SHAM CONTROL	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81940-10	F	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-10	F	SHAM CONTROL	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81940-11	F	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-11	F	SHAM CONTROL	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81940-12	F	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-12	F	SHAM CONTROL	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81940-13	F	SHAM CONTROL	NORMAL	1	11/01/10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81940-13	F	SHAM CONTROL	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81944-01	M	SHAM CONTROL	DISPOSITION	0	11/01/10	8:07	P	FOUND DEAD
81944-02	F	SHAM CONTROL	DISPOSITION	0	11/01/10	8:07	P	FOUND DEAD
81944-03	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81944-03	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-04	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-04	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-05	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-05	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-06	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-06	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-07	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-07	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-08	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-08	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-09	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-09	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-10	M	SHAM CONTROL	NORMAL	1	11/02/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-10	M	SHAM CONTROL	DISPOSITION	4	11/05/10	7:58	P	SCHEDULED EUTHANASIA
81944-11	F	SHAM CONTROL	NORMAL	1	11/02/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-11	F	SHAM CONTROL	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81944-12	F	SHAM CONTROL	NORMAL	1	11/02/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-12	F	SHAM CONTROL	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81944-13	F	SHAM CONTROL	NORMAL	1	11/02/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81944-13	F	SHAM CONTROL	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81944-14	F	SHAM CONTROL	NORMAL	1	11/02/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81944-14	F	SHAM CONTROL	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81952-01	M	SHAM CONTROL	NORMAL	1	10/30/10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-01	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-02	M	SHAM CONTROL	NORMAL	1	10/30/10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-02	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-03	M	SHAM CONTROL	NORMAL	1	10/30/10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-03	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-04	M	SHAM CONTROL	NORMAL	1	10/30/10	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-04	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-05	M	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-05	M	SHAM CONTROL	DISPOSITION	2	10/31/10	7:24	P	MISSING
81952-06	M	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-06	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-07	M	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-07	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-08	M	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-08	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-09	M	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-09	M	SHAM CONTROL	DISPOSITION	2	10/31/10	7:24	P	MISSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81952-10	M	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-10	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-11	M	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-11	M	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-12	F	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-12	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-13	F	SHAM CONTROL	NORMAL	1	10/30/10	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-13	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-14	F	SHAM CONTROL	NORMAL	1	10/30/10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-14	F	SHAM CONTROL	DISPOSITION	4	11/02/10	9:29	P	SCHEDULED EUTHANASIA
81952-15	F	SHAM CONTROL	NORMAL	1	10/30/10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-15	F	SHAM CONTROL	DISPOSITION	2	10/31/10	7:24	P	MISSING
81952-16	F	SHAM CONTROL	NORMAL	1	10/30/10	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81952-16	F	SHAM CONTROL	DISPOSITION	2	10/31/10	7:24	P	MISSING
81963-01	M	SHAM CONTROL	NORMAL	1	10/31/10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-01	M	SHAM CONTROL	DISPOSITION	4	11/03/10	10:13	P	SCHEDULED EUTHANASIA
81963-02	M	SHAM CONTROL	NORMAL	1	10/31/10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-02	M	SHAM CONTROL	DISPOSITION	2	11/01/10	11:34	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81963-03	M	SHAM CONTROL	NORMAL	1	10/31/10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-03	M	SHAM CONTROL	DISPOSITION	4	11/03/10	10:13	P	SCHEDULED EUTHANASIA
81963-04	M	SHAM CONTROL	NORMAL	1	10/31/10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 7

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81963-04	M	SHAM CONTROL	DISPOSITION	4	11/03/10	10:13	P	SCHEDULED EUTHANASIA
81963-05	M	SHAM CONTROL	NORMAL	1	10/31/10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-05	M	SHAM CONTROL	DISPOSITION	2	11/01/10	11:34	P	MISSING
81963-06	M	SHAM CONTROL	NORMAL	1	10/31/10	6:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-06	M	SHAM CONTROL	DISPOSITION	3	11/02/10	14:03	P	MISSING
81963-07	M	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-07	M	SHAM CONTROL	DISPOSITION	4	11/03/10	10:13	P	SCHEDULED EUTHANASIA
81963-08	M	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-08	M	SHAM CONTROL	DISPOSITION	2	11/01/10	11:33	P	FOUND DEAD
81963-09	F	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-09	F	SHAM CONTROL	DISPOSITION	4	11/03/10	10:13	P	SCHEDULED EUTHANASIA
81963-10	F	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-10	F	SHAM CONTROL	DISPOSITION	4	11/03/10	10:14	P	SCHEDULED EUTHANASIA
81963-11	F	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-11	F	SHAM CONTROL	DISPOSITION	4	11/03/10	10:14	P	SCHEDULED EUTHANASIA
81963-12	F	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-12	F	SHAM CONTROL	DISPOSITION	4	11/03/10	9:11	P	FOUND DEAD
81963-12	F	SHAM CONTROL	BODY/INTEGUMENT	3	11/02/10	14:03	P	BODY PALE
81963-13	F	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-13	F	SHAM CONTROL	DISPOSITION	2	11/01/10	11:33	P	FOUND DEAD
81963-14	F	SHAM CONTROL	NORMAL	1	10/31/10	6:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-14	F	SHAM CONTROL	DISPOSITION	4	11/03/10	10:14	P	SCHEDULED EUTHANASIA
81963-15	F	SHAM CONTROL	NORMAL	1	10/31/10	6:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81963-15	F	SHAM CONTROL	DISPOSITION	4	11/03/10	10:14	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 8

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81920-01	M	0 MG/KG	NORMAL	1	10/31/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-01	M	0 MG/KG	DISPOSITION	4	11/03/10	10:18	P	SCHEDULED EUTHANASIA
81920-02	M	0 MG/KG	NORMAL	1	10/31/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-02	M	0 MG/KG	DISPOSITION	4	11/03/10	10:18	P	SCHEDULED EUTHANASIA
81920-03	M	0 MG/KG	NORMAL	1	10/31/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-03	M	0 MG/KG	DISPOSITION	4	11/03/10	10:19	P	SCHEDULED EUTHANASIA
81920-04	M	0 MG/KG	NORMAL	1	10/31/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-04	M	0 MG/KG	DISPOSITION	4	11/03/10	10:19	P	SCHEDULED EUTHANASIA
81920-05	M	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-05	M	0 MG/KG	DISPOSITION	4	11/03/10	10:19	P	SCHEDULED EUTHANASIA
81920-06	M	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-06	M	0 MG/KG	DISPOSITION	4	11/03/10	10:19	P	SCHEDULED EUTHANASIA
81920-07	M	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-07	M	0 MG/KG	DISPOSITION	4	11/03/10	10:30	P	SCHEDULED EUTHANASIA
81920-08	F	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-08	F	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81920-09	F	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-09	F	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81920-10	F	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-10	F	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81920-11	F	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-11	F	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81920-12	F	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-12	F	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81920-13	F	0 MG/KG	NORMAL	1	10/31/10	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81920-13	F	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81938-01	M	0 MG/KG	NORMAL	1	10/31/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-01	M	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81938-02	M	0 MG/KG	NORMAL	1	10/31/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-02	M	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81938-03	M	0 MG/KG	NORMAL	1	10/31/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-03	M	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81938-04	M	0 MG/KG	NORMAL	1	10/31/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-04	M	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81938-05	M	0 MG/KG	NORMAL	1	10/31/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-05	M	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81938-06	M	0 MG/KG	NORMAL	1	10/31/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-06	M	0 MG/KG	DISPOSITION	4	11/03/10	10:20	P	SCHEDULED EUTHANASIA
81938-07	M	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81938-07	M	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-08	M	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-08	M	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-09	F	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-09	F	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-10	F	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-10	F	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-11	F	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-11	F	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-12	F	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-12	F	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-13	F	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-13	F	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-14	F	0 MG/KG	NORMAL	1	10/31/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-14	F	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81938-15	F	0 MG/KG	NORMAL	1	10/31/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81938-15	F	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81939-01	M	0 MG/KG	NORMAL	1	10/30/10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-01	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-02	M	0 MG/KG	NORMAL	1	10/30/10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81939-02	M	0 MG/KG	NORMAL	4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-02	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-03	M	0 MG/KG	NORMAL	1	10/30/10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-03	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-04	M	0 MG/KG	NORMAL	1	10/30/10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-04	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-05	M	0 MG/KG	NORMAL	1	10/30/10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-05	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-06	M	0 MG/KG	NORMAL	1	10/30/10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-06	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-07	M	0 MG/KG	NORMAL	1	10/30/10	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-07	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-08	M	0 MG/KG	NORMAL	1	10/30/10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-08	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-09	M	0 MG/KG	NORMAL	1	10/30/10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-09	M	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-10	F	0 MG/KG	NORMAL	1	10/30/10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-10	F	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-11	F	0 MG/KG	NORMAL	1	10/30/10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-11	F	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-12	F	0 MG/KG	NORMAL	1	10/30/10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81939-12	F	0 MG/KG	NORMAL	4	11/02/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-12	F	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-13	F	0 MG/KG	NORMAL	1	10/30/10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-13	F	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81939-14	F	0 MG/KG	NORMAL	1	10/30/10	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81939-14	F	0 MG/KG	DISPOSITION	4	11/02/10	9:30	P	SCHEDULED EUTHANASIA
81942-01	M	0 MG/KG	NORMAL	1	10/30/10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-01	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-02	M	0 MG/KG	NORMAL	1	10/30/10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-02	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-03	M	0 MG/KG	NORMAL	1	10/30/10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-03	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-04	M	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-04	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-05	M	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-05	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-06	M	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-06	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-07	M	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-07	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81942-08	M	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-08	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-08	M	0 MG/KG	BODY/INTEGUMENT	0	10/29/10	8:22	P	SCABBING RIGHT LATERAL ABDOMINAL AREA
				4	11/02/10	8:56	P	SCABBING RIGHT LATERAL ABDOMINAL AREA
81942-09	M	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-09	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-10	F	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-10	F	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-11	F	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-11	F	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-12	F	0 MG/KG	NORMAL	1	10/30/10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-12	F	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-13	F	0 MG/KG	NORMAL	1	10/30/10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-13	F	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-14	F	0 MG/KG	NORMAL	1	10/30/10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-14	F	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81942-15	F	0 MG/KG	NORMAL	1	10/30/10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81942-15	F	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81950-01	M	0 MG/KG	DISPOSITION	1	10/31/10	7:37	P	MISSING
81950-01	M	0 MG/KG	BODY/INTEGUMENT	0	10/30/10	8:09	P	BODY PALE
				0	10/30/10	8:09	P	BODY COOL
81950-02	M	0 MG/KG	NORMAL	1	10/31/10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81950-02	M	0 MG/KG	NORMAL	4	11/03/10	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-02	M	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81950-03	M	0 MG/KG	NORMAL	1	10/31/10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-03	M	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81950-04	M	0 MG/KG	NORMAL	1	10/31/10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-04	M	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81950-05	M	0 MG/KG	NORMAL	1	10/31/10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-05	M	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81950-06	M	0 MG/KG	NORMAL	1	10/31/10	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-06	M	0 MG/KG	DISPOSITION	4	11/03/10	10:21	P	SCHEDULED EUTHANASIA
81950-07	M	0 MG/KG	NORMAL	1	10/31/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-07	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81950-08	F	0 MG/KG	NORMAL	1	10/31/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-08	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81950-09	F	0 MG/KG	NORMAL	1	10/31/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-09	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81950-10	F	0 MG/KG	NORMAL	1	10/31/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81950-10	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81958-01	M	0 MG/KG	NORMAL	1	10/30/10	12:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-01	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81958-02	M	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-02	M	0 MG/KG	DISPOSITION	4	11/02/10	9:31	P	SCHEDULED EUTHANASIA
81958-03	M	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-03	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-04	M	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-04	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-05	M	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-05	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-06	M	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-06	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-07	M	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-07	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-08	M	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-08	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-09	F	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-09	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-10	F	0 MG/KG	NORMAL	1	10/30/10	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-10	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-11	F	0 MG/KG	NORMAL	1	10/30/10	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-11	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 16

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81958-12	F	0 MG/KG	NORMAL	1	10/30/10	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-12	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-13	F	0 MG/KG	NORMAL	1	10/30/10	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-13	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-14	F	0 MG/KG	NORMAL	1	10/30/10	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-14	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-15	F	0 MG/KG	NORMAL	1	10/30/10	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-15	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81958-16	F	0 MG/KG	NORMAL	1	10/30/10	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81958-16	F	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81967-01	M	0 MG/KG	NORMAL	1	10/31/10	7:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-01	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-02	M	0 MG/KG	NORMAL	1	10/31/10	7:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-02	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-03	M	0 MG/KG	NORMAL	1	10/31/10	7:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-03	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-04	M	0 MG/KG	NORMAL	1	10/31/10	7:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-04	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-05	M	0 MG/KG	NORMAL	1	10/31/10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81967-05	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-06	M	0 MG/KG	NORMAL	1	10/31/10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-06	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-07	M	0 MG/KG	NORMAL	1	10/31/10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-07	M	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-08	F	0 MG/KG	NORMAL	1	10/31/10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-08	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-09	F	0 MG/KG	NORMAL	1	10/31/10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-09	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-10	F	0 MG/KG	NORMAL	1	10/31/10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-10	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-11	F	0 MG/KG	NORMAL	1	10/31/10	7:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-11	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-12	F	0 MG/KG	NORMAL	1	10/31/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-12	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-13	F	0 MG/KG	NORMAL	1	10/31/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-13	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-14	F	0 MG/KG	NORMAL	1	10/31/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-14	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-15	F	0 MG/KG	NORMAL	1	10/31/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81967-15	F	0 MG/KG	DISPOSITION	4	11/03/10	10:22	P	SCHEDULED EUTHANASIA
81967-16	F	0 MG/KG	NORMAL	1	10/31/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81967-16	F	0 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81975-01	M	0 MG/KG	NORMAL	1	10/30/10	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-01	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81975-02	M	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-02	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81975-03	M	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-03	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81975-04	M	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-04	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81975-05	M	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-05	M	0 MG/KG	DISPOSITION	4	11/02/10	9:32	P	SCHEDULED EUTHANASIA
81975-06	M	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-06	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81975-07	M	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-07	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81975-08	M	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-08	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81975-09	F	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 19

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81975-09	F	0 MG/KG	NORMAL	4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-09	F	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81975-10	F	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-10	F	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81975-11	F	0 MG/KG	NORMAL	1	10/30/10	12:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-11	F	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81975-12	F	0 MG/KG	NORMAL	1	10/30/10	12:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-12	F	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81975-13	F	0 MG/KG	NORMAL	1	10/30/10	12:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81975-13	F	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-01	M	0 MG/KG	DISPOSITION	0	10/29/10	14:28	P	FOUND DEAD
81979-02	M	0 MG/KG	NORMAL	1	10/30/10	12:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-02	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-03	M	0 MG/KG	NORMAL	1	10/30/10	12:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-03	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-04	M	0 MG/KG	NORMAL	1	10/30/10	12:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-04	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-05	M	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-05	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-06	M	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81979-06	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-07	M	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-07	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-08	M	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-08	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-09	M	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-09	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-10	M	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-10	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-11	M	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-11	M	0 MG/KG	DISPOSITION	4	11/02/10	9:33	P	SCHEDULED EUTHANASIA
81979-12	F	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-12	F	0 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81979-13	F	0 MG/KG	NORMAL	1	10/30/10	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-13	F	0 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81979-14	F	0 MG/KG	NORMAL	1	10/30/10	12:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-14	F	0 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81979-15	F	0 MG/KG	NORMAL	1	10/30/10	12:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81979-15	F	0 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81915-01	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81915-01	M	100 MG/KG	NORMAL	4	11/04/10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-01	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-02	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-02	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-03	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-03	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-04	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-04	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-05	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-05	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-06	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-06	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-07	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-07	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-08	M	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-08	M	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-09	F	100 MG/KG	NORMAL	1	11/01/10	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-09	F	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-10	F	100 MG/KG	NORMAL	1	11/01/10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-10	F	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-11	F	100 MG/KG	NORMAL	1	11/01/10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 22

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81915-11	F	100 MG/KG	NORMAL	4	11/04/10	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-11	F	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81915-12	F	100 MG/KG	NORMAL	1	11/01/10	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81915-12	F	100 MG/KG	DISPOSITION	4	11/04/10	8:09	P	SCHEDULED EUTHANASIA
81916-01	M	100 MG/KG	NORMAL	1	10/31/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-01	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-02	M	100 MG/KG	NORMAL	1	10/31/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-02	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-03	M	100 MG/KG	NORMAL	1	10/31/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-03	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-04	M	100 MG/KG	NORMAL	1	10/31/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-04	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-05	M	100 MG/KG	NORMAL	1	10/31/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-05	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-06	M	100 MG/KG	NORMAL	1	10/31/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-06	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-07	F	100 MG/KG	NORMAL	1	10/31/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-07	F	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-08	F	100 MG/KG	NORMAL	1	10/31/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-08	F	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81916-09	F	100 MG/KG	NORMAL	1	10/31/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-09	F	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-10	F	100 MG/KG	NORMAL	1	10/31/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-10	F	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81916-11	F	100 MG/KG	NORMAL	1	10/31/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81916-11	F	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81917-01	M	100 MG/KG	NORMAL	1	11/01/10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-01	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-02	M	100 MG/KG	NORMAL	1	11/01/10	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-02	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-03	M	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-03	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-04	M	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-04	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-05	M	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-05	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-06	M	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-06	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-07	M	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81917-07	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-08	M	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-08	M	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-09	F	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-09	F	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-10	F	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-10	F	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-11	F	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-11	F	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-12	F	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-12	F	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81917-13	F	100 MG/KG	NORMAL	1	11/01/10	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81917-13	F	100 MG/KG	DISPOSITION	4	11/04/10	8:10	P	SCHEDULED EUTHANASIA
81921-01	M	100 MG/KG	NORMAL	1	11/02/10	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-01	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-02	M	100 MG/KG	NORMAL	1	11/02/10	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-02	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-03	M	100 MG/KG	NORMAL	1	11/02/10	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-03	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-04	M	100 MG/KG	NORMAL	4	11/05/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81921-04	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-04	M	100 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:10	P	SUBCUTANEOUS HEMORRHAGE DORSAL HEAD
81921-05	M	100 MG/KG	NORMAL	1	11/02/10	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-05	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-06	M	100 MG/KG	NORMAL	1	11/02/10	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-06	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-07	M	100 MG/KG	NORMAL	1	11/02/10	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-07	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-08	M	100 MG/KG	NORMAL	1	11/02/10	14:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-08	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-09	M	100 MG/KG	NORMAL	1	11/02/10	14:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-09	M	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-10	F	100 MG/KG	NORMAL	1	11/02/10	14:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-10	F	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-10	F	100 MG/KG	BODY/INTEGUMENT	4	11/05/10	7:40	P	BODY PALE
81921-11	F	100 MG/KG	NORMAL	1	11/02/10	14:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-11	F	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-12	F	100 MG/KG	NORMAL	1	11/02/10	14:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-12	F	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81921-13	F	100 MG/KG	NORMAL	1	11/02/10	14:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81921-13	F	100 MG/KG	DISPOSITION	4	11/05/10	7:59	P	SCHEDULED EUTHANASIA
81926-01	M	100 MG/KG	NORMAL	1	11/02/10	14:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81926-01	M	100 MG/KG	NORMAL	4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-01	M	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-02	M	100 MG/KG	NORMAL	1	11/02/10	14:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-02	M	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-03	M	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-03	M	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-04	M	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-04	M	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-05	M	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-05	M	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-06	M	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-06	M	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-07	M	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-07	M	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-08	F	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-08	F	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-09	F	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-09	F	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-10	F	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-10	F	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-11	F	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81926-11	F	100 MG/KG	NORMAL	4	11/05/10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-11	F	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81926-12	F	100 MG/KG	NORMAL	1	11/02/10	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81926-12	F	100 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81930-01	M	100 MG/KG	NORMAL	1	10/29/10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-01	M	100 MG/KG	DISPOSITION	4	11/01/10	9:21	P	SCHEDULED EUTHANASIA
81930-02	M	100 MG/KG	NORMAL	1	10/29/10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-02	M	100 MG/KG	DISPOSITION	4	11/01/10	9:21	P	SCHEDULED EUTHANASIA
81930-03	M	100 MG/KG	NORMAL	1	10/29/10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-03	M	100 MG/KG	DISPOSITION	4	11/01/10	9:21	P	SCHEDULED EUTHANASIA
81930-04	M	100 MG/KG	NORMAL	1	10/29/10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-04	M	100 MG/KG	DISPOSITION	4	11/01/10	9:21	P	SCHEDULED EUTHANASIA
81930-05	M	100 MG/KG	NORMAL	1	10/29/10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-05	M	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81930-06	M	100 MG/KG	NORMAL	1	10/29/10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-06	M	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81930-07	F	100 MG/KG	NORMAL	1	10/29/10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-07	F	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81930-08	F	100 MG/KG	NORMAL	1	10/29/10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-08	F	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 28

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81930-09	F	100 MG/KG	NORMAL	1	10/29/10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-09	F	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81930-10	F	100 MG/KG	NORMAL	1	10/29/10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-10	F	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81930-11	F	100 MG/KG	NORMAL	1	10/29/10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-11	F	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81930-12	F	100 MG/KG	NORMAL	1	10/29/10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81930-12	F	100 MG/KG	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81941-01	M	100 MG/KG	NORMAL	1	10/30/10	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-01	M	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-02	M	100 MG/KG	NORMAL	1	10/30/10	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-02	M	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-03	M	100 MG/KG	NORMAL	1	10/30/10	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-03	M	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-04	M	100 MG/KG	NORMAL	1	10/30/10	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-04	M	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-05	M	100 MG/KG	NORMAL	1	10/30/10	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-05	M	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-06	F	100 MG/KG	NORMAL	1	10/30/10	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 29

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81941-06	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-07	F	100 MG/KG	NORMAL	1	10/30/10	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-07	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-08	F	100 MG/KG	NORMAL	1	10/30/10	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-08	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-09	F	100 MG/KG	NORMAL	1	10/30/10	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-09	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-10	F	100 MG/KG	NORMAL	1	10/30/10	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-10	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-11	F	100 MG/KG	NORMAL	1	10/30/10	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-11	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-12	F	100 MG/KG	NORMAL	1	10/30/10	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-12	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81941-13	F	100 MG/KG	NORMAL	1	10/30/10	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81941-13	F	100 MG/KG	DISPOSITION	4	11/02/10	9:34	P	SCHEDULED EUTHANASIA
81960-01	M	100 MG/KG	NORMAL	1	10/30/10	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-01	M	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-02	M	100 MG/KG	NORMAL	1	10/30/10	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-02	M	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-03	M	100 MG/KG	NORMAL	1	10/30/10	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81960-03	M	100 MG/KG	NORMAL	4	11/02/10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-03	M	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-04	M	100 MG/KG	NORMAL	1	10/30/10	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-04	M	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-05	M	100 MG/KG	NORMAL	1	10/30/10	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-05	M	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-06	M	100 MG/KG	NORMAL	1	10/30/10	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-06	M	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-06	M	100 MG/KG	BODY/INTEGUMENT	4	11/02/10	9:13	P	BODY PALE
81960-07	F	100 MG/KG	NORMAL	1	10/30/10	13:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-07	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-08	F	100 MG/KG	NORMAL	1	10/30/10	13:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-08	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-09	F	100 MG/KG	NORMAL	1	10/30/10	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-09	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-10	F	100 MG/KG	NORMAL	1	10/30/10	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-10	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-11	F	100 MG/KG	NORMAL	1	10/30/10	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-11	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-12	F	100 MG/KG	NORMAL	1	10/30/10	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-12	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-13	F	100 MG/KG	NORMAL	1	10/30/10	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81960-13	F	100 MG/KG	NORMAL	4	11/02/10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-13	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-14	F	100 MG/KG	NORMAL	1	10/30/10	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-14	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81960-15	F	100 MG/KG	NORMAL	1	10/30/10	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81960-15	F	100 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81961-01	M	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-01	M	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-02	M	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-02	M	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-03	M	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-03	M	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-04	M	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-04	M	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-05	M	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-05	M	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-06	M	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-06	M	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-07	F	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-07	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81961-08	F	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-08	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-09	F	100 MG/KG	NORMAL	1	11/01/10	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-09	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-10	F	100 MG/KG	NORMAL	1	11/01/10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-10	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-11	F	100 MG/KG	NORMAL	1	11/01/10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-11	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-12	F	100 MG/KG	NORMAL	1	11/01/10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-12	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-13	F	100 MG/KG	NORMAL	1	11/01/10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-13	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81961-14	F	100 MG/KG	NORMAL	1	11/01/10	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81961-14	F	100 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81962-01	M	100 MG/KG	NORMAL	1	10/31/10	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-01	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81962-02	M	100 MG/KG	NORMAL	1	10/31/10	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-02	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81962-03	M	100 MG/KG	NORMAL	1	10/31/10	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81962-03	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81962-04	M	100 MG/KG	NORMAL	1	10/31/10	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-04	M	100 MG/KG	DISPOSITION	4	11/03/10	10:23	P	SCHEDULED EUTHANASIA
81962-05	M	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-05	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-06	M	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-06	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-07	M	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-07	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-08	F	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-08	F	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-09	F	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-09	F	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-10	F	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-10	F	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-11	F	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-11	F	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-12	F	100 MG/KG	NORMAL	1	10/31/10	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-12	F	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-13	F	100 MG/KG	NORMAL	1	10/31/10	13:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81962-13	F	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81962-14	F	100 MG/KG	NORMAL	1	10/31/10	13:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81962-14	F	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-01	M	100 MG/KG	NORMAL	1	10/31/10	13:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-01	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-02	M	100 MG/KG	NORMAL	1	10/31/10	13:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-02	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-03	M	100 MG/KG	NORMAL	1	10/31/10	13:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-03	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-04	M	100 MG/KG	NORMAL	1	10/31/10	13:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-04	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-05	M	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-05	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-06	M	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-06	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-07	M	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-07	M	100 MG/KG	DISPOSITION	4	11/03/10	10:24	P	SCHEDULED EUTHANASIA
81972-08	F	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81972-08	F	100 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81972-09	F	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS	
81972-09	F	100 MG/KG	NORMAL	4	11/03/10	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81972-09	F	100 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA	
81972-10	F	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/03/10	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81972-10	F	100 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA	
81972-11	F	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/03/10	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81972-11	F	100 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA	
81972-12	F	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/03/10	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81972-12	F	100 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA	
81972-13	F	100 MG/KG	NORMAL	1	10/31/10	13:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/03/10	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81972-13	F	100 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA	
81978-01	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-01	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-02	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-02	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-03	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-03	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-04	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-04	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-05	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-05	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY
* - LATE COMPUTER ENTRY OBSERVATIONS FOR ABOVE DATES

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 36

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS	
81978-06	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-06	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-07	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-07	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-08	M	100 MG/KG	NORMAL	1	10/30/10	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-08	M	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-09	F	100 MG/KG	NORMAL	1	10/30/10	13:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-09	F	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-10	F	100 MG/KG	NORMAL	1	10/30/10	13:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-10	F	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-11	F	100 MG/KG	NORMAL	1	10/30/10	13:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-11	F	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-12	F	100 MG/KG	NORMAL	1	10/30/10	13:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-12	F	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81978-13	F	100 MG/KG	NORMAL	1	10/30/10	13:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/02/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81978-13	F	100 MG/KG	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA	*
81914-01	M	300 MG/KG	NORMAL	1	11/10/10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/13/10	7:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
81914-01	M	300 MG/KG	DISPOSITION	4	11/13/10	13:12	P	SCHEDULED EUTHANASIA	
81914-02	M	300 MG/KG	NORMAL	1	11/10/10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	
				4	11/13/10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS	

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

* - LATE COMPUTER ENTRY OBSERVATIONS FOR ABOVE DATES

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81914-02	M	300 MG/KG	DISPOSITION	4	11/13/10	13:12	P	SCHEDULED EUTHANASIA
81914-03	M	300 MG/KG	NORMAL	1	11/10/10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-03	M	300 MG/KG	DISPOSITION	4	11/13/10	13:12	P	SCHEDULED EUTHANASIA
81914-04	M	300 MG/KG	NORMAL	1	11/10/10	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-04	M	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-05	M	300 MG/KG	NORMAL	1	11/10/10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-05	M	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-06	M	300 MG/KG	NORMAL	1	11/10/10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-06	M	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-07	M	300 MG/KG	NORMAL	1	11/10/10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-07	M	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-08	M	300 MG/KG	NORMAL	1	11/10/10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-08	M	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-09	F	300 MG/KG	NORMAL	1	11/10/10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-09	F	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-10	F	300 MG/KG	NORMAL	1	11/10/10	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-10	F	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-11	F	300 MG/KG	NORMAL	1	11/10/10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-11	F	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-12	F	300 MG/KG	NORMAL	1	11/10/10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 38

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81914-12	F	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-13	F	300 MG/KG	NORMAL	1	11/10/10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-13	F	300 MG/KG	DISPOSITION	3	11/12/10	10:55	P	FOUND DEAD
81914-14	F	300 MG/KG	NORMAL	1	11/10/10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-14	F	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81914-15	F	300 MG/KG	NORMAL	1	11/10/10	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/13/10	7:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81914-15	F	300 MG/KG	DISPOSITION	4	11/13/10	13:13	P	SCHEDULED EUTHANASIA
81931-01	M	300 MG/KG	DISPOSITION	0	10/31/10	8:28	P	EUTHANIZED IN EXTREMIS; PARTIALLY CANNIBALIZED
81931-01	M	300 MG/KG	BODY/INTEGUMENT	0	10/31/10	8:01	P	LACERATION LEFT FORELIMB
				0	10/31/10	8:01	P	LEFT FORELIMB MISSING
				0	10/31/10	8:01	2	WET RED MATERIAL LEFT FORELIMB
				0	10/31/10	8:02	P	BODY COOL
81931-02	F	300 MG/KG	DISPOSITION	1	11/01/10	11:53	P	MISSING
81931-02	F	300 MG/KG	BODY/INTEGUMENT	0	10/31/10	8:02	P	SMALL STATURE
81931-03	M	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-03	M	300 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81931-04	M	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-04	M	300 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81931-05	M	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-05	M	300 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81931-06	M	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-06	M	300 MG/KG	DISPOSITION	4	11/04/10	8:11	P	SCHEDULED EUTHANASIA
81931-07	F	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81931-07	F	300 MG/KG	NORMAL	4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-07	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81931-08	F	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-08	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81931-09	F	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-09	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81931-10	F	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-10	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81931-11	F	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-11	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81931-12	F	300 MG/KG	NORMAL	1	11/01/10	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-12	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81931-13	F	300 MG/KG	NORMAL	1	11/01/10	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81931-13	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-01	M	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-01	M	300 MG/KG	BODY/INTEGUMENT	0	10/31/10	8:16	P	LACERATION LEFT HINDLIMB
				0	10/31/10	8:16	2	WET RED MATERIAL LEFT HINDLIMB
				1	11/01/10	11:56	P	SWOLLEN LEFT HINDLIMB
				1	11/01/10	11:56	P	SCABBING LEFT HINDLIMB
				4	11/04/10	7:43	P	SCABBING LEFT HINDLIMB
				4	11/04/10	7:43	P	SMALL STATURE
81934-01	M	300 MG/KG	CARDIO-PULMONARY	4	11/04/10	7:43	P	GASPING
81934-02	M	300 MG/KG	NORMAL	1	11/01/10	11:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81934-02	M	300 MG/KG	NORMAL	4	11/04/10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-02	M	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-03	M	300 MG/KG	NORMAL	1	11/01/10	11:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-03	M	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-04	M	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-04	M	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-05	M	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-05	M	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-06	M	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-06	M	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-07	F	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-07	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-08	F	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-08	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-09	F	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-09	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-10	F	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-10	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81934-11	F	300 MG/KG	NORMAL	1	11/01/10	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81934-11	F	300 MG/KG	DISPOSITION	4	11/04/10	8:12	P	SCHEDULED EUTHANASIA
81943-01	M	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81943-01	M	300 MG/KG	NORMAL	4	11/04/10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-01	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-02	M	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-02	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-03	M	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-03	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-04	M	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-04	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-05	M	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-05	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-06	M	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-06	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-07	F	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-07	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-08	F	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-08	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-09	F	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-09	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-10	F	300 MG/KG	NORMAL	1	11/01/10	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-10	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-11	F	300 MG/KG	NORMAL	1	11/01/10	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81943-11	F	300 MG/KG	NORMAL	4	11/04/10	7:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-11	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81943-12	F	300 MG/KG	NORMAL	1	11/01/10	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81943-12	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-01	M	300 MG/KG	NORMAL	1	11/01/10	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-01	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-02	M	300 MG/KG	NORMAL	1	11/01/10	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-02	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-03	M	300 MG/KG	NORMAL	1	11/01/10	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-03	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-04	M	300 MG/KG	NORMAL	1	11/01/10	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-04	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-05	M	300 MG/KG	NORMAL	1	11/01/10	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-05	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-06	M	300 MG/KG	NORMAL	1	11/01/10	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-06	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-07	M	300 MG/KG	NORMAL	1	11/01/10	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-07	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-08	M	300 MG/KG	NORMAL	1	11/01/10	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-08	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 43

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81946-09	M	300 MG/KG	NORMAL	1	11/01/10	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-09	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-10	M	300 MG/KG	NORMAL	1	11/01/10	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-10	M	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-11	F	300 MG/KG	NORMAL	1	11/01/10	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-11	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81946-12	F	300 MG/KG	NORMAL	1	11/01/10	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81946-12	F	300 MG/KG	DISPOSITION	4	11/04/10	8:13	P	SCHEDULED EUTHANASIA
81957-01	M	300 MG/KG	DISPOSITION	0	11/02/10	13:47	P	FOUND DEAD
81957-02	M	300 MG/KG	NORMAL	1	11/03/10	14:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-02	M	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-03	M	300 MG/KG	NORMAL	1	11/03/10	14:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-03	M	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-04	M	300 MG/KG	NORMAL	1	11/03/10	14:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-04	M	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-05	M	300 MG/KG	NORMAL	1	11/03/10	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-05	M	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-06	M	300 MG/KG	NORMAL	1	11/03/10	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-06	M	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-07	M	300 MG/KG	NORMAL	1	11/03/10	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81957-07	M	300 MG/KG	NORMAL	4	11/06/10	7:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-07	M	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-08	F	300 MG/KG	NORMAL	1	11/03/10	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-08	F	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-09	M	300 MG/KG	NORMAL	1	11/03/10	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-09	M	300 MG/KG	DISPOSITION	4	11/06/10	7:30	P	SCHEDULED EUTHANASIA
81957-10	F	300 MG/KG	NORMAL	1	11/03/10	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81957-10	F	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81959-01	M	300 MG/KG	NORMAL	1	10/31/10	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-01	M	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-02	M	300 MG/KG	NORMAL	1	10/31/10	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-02	M	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-03	M	300 MG/KG	NORMAL	1	10/31/10	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-03	M	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-04	M	300 MG/KG	NORMAL	1	10/31/10	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-04	M	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-05	M	300 MG/KG	NORMAL	1	10/31/10	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-05	M	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-06	F	300 MG/KG	NORMAL	1	10/31/10	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-06	F	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81959-07	F	300 MG/KG	NORMAL	1	10/31/10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-07	F	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-08	F	300 MG/KG	NORMAL	1	10/31/10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-08	F	300 MG/KG	DISPOSITION	4	11/03/10	9:43	P	FOUND DEAD
81959-09	F	300 MG/KG	NORMAL	1	10/31/10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-09	F	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-10	F	300 MG/KG	NORMAL	1	10/31/10	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-10	F	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-11	F	300 MG/KG	NORMAL	1	10/31/10	13:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-11	F	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-12	F	300 MG/KG	NORMAL	1	10/31/10	13:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-12	F	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81959-13	F	300 MG/KG	NORMAL	1	10/31/10	13:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81959-13	F	300 MG/KG	DISPOSITION	4	11/03/10	10:25	P	SCHEDULED EUTHANASIA
81974-01	M	300 MG/KG	DISPOSITION	0	10/30/10	8:28	P	FOUND DEAD
81974-02	M	300 MG/KG	DISPOSITION	0	10/30/10	8:28	P	FOUND DEAD
81974-03	F	300 MG/KG	DISPOSITION	0	10/30/10	8:29	P	FOUND DEAD
81974-04	F	300 MG/KG	DISPOSITION	0	10/30/10	8:29	P	FOUND DEAD
81974-05	F	300 MG/KG	DISPOSITION	0	10/30/10	8:30	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81974-06	F	300 MG/KG	DISPOSITION	0	10/30/10	8:30	P	FOUND DEAD
81974-07	U	300 MG/KG	DISPOSITION	0	10/30/10	8:30	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81974-08	U	300 MG/KG	DISPOSITION	0	10/30/10	8:30	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81974-09	M	300 MG/KG	NORMAL	1	10/31/10	13:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81974-09	M	300 MG/KG	NORMAL	4	11/03/10	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81974-09	M	300 MG/KG	DISPOSITION	4	11/03/10	10:26	P	SCHEDULED EUTHANASIA
81974-09	M	300 MG/KG	BODY/INTEGUMENT	0	10/30/10	8:31	P	BODY PALE
81974-10	M	300 MG/KG	NORMAL	1	10/31/10	13:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81974-10	M	300 MG/KG	DISPOSITION	4	11/03/10	10:26	P	SCHEDULED EUTHANASIA
81976-01	M	300 MG/KG	NORMAL	1	11/03/10	14:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-01	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-02	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-02	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-03	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-03	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-04	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-04	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-05	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-05	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-06	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-06	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-07	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-07	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-08	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81976-08	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-09	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-09	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-10	M	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-10	M	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-11	F	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-11	F	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-12	F	300 MG/KG	NORMAL	1	11/03/10	14:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-12	F	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81976-13	F	300 MG/KG	NORMAL	1	11/03/10	14:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81976-13	F	300 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81977-01	M	300 MG/KG	NORMAL	1	11/02/10	14:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-01	M	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-02	M	300 MG/KG	NORMAL	1	11/02/10	14:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-02	M	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-03	M	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-03	M	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-04	F	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-04	F	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-05	F	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 48

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81977-05	F	300 MG/KG	NORMAL	4	11/05/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-05	F	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-06	F	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-06	F	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-07	F	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-07	F	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-08	F	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-08	F	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-09	F	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-09	F	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-10	F	300 MG/KG	NORMAL	1	11/02/10	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-10	F	300 MG/KG	DISPOSITION	4	11/05/10	8:00	P	SCHEDULED EUTHANASIA
81977-11	F	300 MG/KG	NORMAL	1	11/02/10	14:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81977-11	F	300 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-01	M	900 MG/KG	DISPOSITION	1	11/02/10	14:22	P	FOUND DEAD
81918-01	M	900 MG/KG	BODY/INTEGUMENT	0	11/01/10	8:25	P	SUBCUTANEOUS HEMORRHAGE DORSAL HEAD
				0	11/01/10	8:25	P	BODY PALE
81918-02	M	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-02	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:25	P	BODY COOL
				4	11/05/10	7:48	P	BODY COOL
81918-03	M	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-03	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:25	P	BODY COOL
				4	11/05/10	7:48	P	BODY COOL

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81918-04	M	900 MG/KG	DISPOSITION	1	11/02/10	14:23	P	MISSING
81918-05	M	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-05	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:25	P	BODY COOL
				4	11/05/10	7:48	P	BODY COOL
81918-06	M	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-06	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:25	P	BODY COOL
				4	11/05/10	7:49	P	BODY COOL
81918-07	M	900 MG/KG	DISPOSITION	1	11/02/10	14:23	P	FOUND DEAD
81918-08	M	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-08	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:26	P	BODY COOL
				4	11/05/10	7:49	P	BODY COOL
81918-09	M	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-09	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:26	P	BODY COOL
				4	11/05/10	7:49	P	BODY COOL
				4	11/05/10	7:49	P	SMALL STATURE
81918-10	F	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-10	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:26	P	BODY COOL
				4	11/05/10	7:49	P	BODY COOL
81918-11	F	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-11	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:26	P	BODY COOL
				4	11/05/10	7:49	P	BODY COOL
				4	11/05/10	7:50	P	SMALL STATURE
81918-12	F	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-12	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:27	P	BODY COOL
				4	11/05/10	7:50	P	BODY COOL
81918-13	F	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-13	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:27	P	BODY COOL
				4	11/05/10	7:50	P	BODY COOL
81918-14	F	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-14	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:27	P	BODY COOL

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81918-14	F	900 MG/KG	BODY/INTEGUMENT	4	11/05/10	7:50	P	BODY COOL
				4	11/05/10	7:50	P	SMALL STATURE
81918-15	F	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-15	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:27	P	BODY COOL
				4	11/05/10	7:50	P	BODY COOL
				4	11/05/10	7:50	P	SMALL STATURE
81918-16	F	900 MG/KG	DISPOSITION	4	11/05/10	8:01	P	SCHEDULED EUTHANASIA
81918-16	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	14:27	P	BODY COOL
				4	11/05/10	7:51	P	BODY COOL
81919-01	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-01	M	900 MG/KG	DISPOSITION	4	11/05/10	8:02	P	SCHEDULED EUTHANASIA
81919-02	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-02	M	900 MG/KG	DISPOSITION	4	11/05/10	8:02	P	SCHEDULED EUTHANASIA
81919-03	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-03	M	900 MG/KG	DISPOSITION	4	11/05/10	8:02	P	SCHEDULED EUTHANASIA
81919-04	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-04	M	900 MG/KG	DISPOSITION	4	11/05/10	8:02	P	SCHEDULED EUTHANASIA
81919-05	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-05	M	900 MG/KG	DISPOSITION	4	11/05/10	8:02	P	SCHEDULED EUTHANASIA
81919-06	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-06	M	900 MG/KG	DISPOSITION	4	11/05/10	8:04	P	SCHEDULED EUTHANASIA
81919-07	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81919-07	M	900 MG/KG	DISPOSITION	4	11/05/10	8:03	P	SCHEDULED EUTHANASIA
81919-08	M	900 MG/KG	NORMAL	1	11/02/10	14:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-08	M	900 MG/KG	DISPOSITION	4	11/05/10	8:03	P	SCHEDULED EUTHANASIA
81919-09	F	900 MG/KG	NORMAL	1	11/02/10	14:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/05/10	7:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81919-09	F	900 MG/KG	DISPOSITION	4	11/05/10	8:03	P	SCHEDULED EUTHANASIA
81927-01	M	900 MG/KG	NORMAL	1	11/12/10	7:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-01	M	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-02	M	900 MG/KG	NORMAL	1	11/12/10	7:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-02	M	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-03	M	900 MG/KG	NORMAL	1	11/12/10	7:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-03	M	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-04	M	900 MG/KG	NORMAL	1	11/12/10	7:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-04	M	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-05	M	900 MG/KG	NORMAL	1	11/12/10	7:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-05	M	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-06	M	900 MG/KG	NORMAL	1	11/12/10	7:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-06	M	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-07	F	900 MG/KG	NORMAL	1	11/12/10	7:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-07	F	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-08	F	900 MG/KG	NORMAL	1	11/12/10	7:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81927-08	F	900 MG/KG	NORMAL	4	11/15/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-08	F	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81927-09	F	900 MG/KG	NORMAL	1	11/12/10	7:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/15/10	7:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81927-09	F	900 MG/KG	DISPOSITION	4	11/15/10	7:27	P	SCHEDULED EUTHANASIA
81936-01	M	900 MG/KG	NORMAL	1	11/01/10	12:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-01	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-02	M	900 MG/KG	NORMAL	1	11/01/10	12:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-02	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-03	M	900 MG/KG	NORMAL	1	11/01/10	12:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-03	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-04	M	900 MG/KG	NORMAL	1	11/01/10	12:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-04	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-05	M	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-05	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-06	M	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-06	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-07	M	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-07	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-08	M	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-08	M	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 53

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81936-09	F	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-09	F	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-10	F	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-10	F	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-11	F	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-11	F	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-12	F	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-12	F	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-13	F	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-13	F	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81936-14	F	900 MG/KG	NORMAL	1	11/01/10	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81936-14	F	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81937-01	F	900 MG/KG	NORMAL	1	11/01/10	12:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/04/10	7:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81937-01	F	900 MG/KG	DISPOSITION	4	11/04/10	8:14	P	SCHEDULED EUTHANASIA
81951-01	M	900 MG/KG	DISPOSITION	0	10/30/10	8:41	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81951-02	F	900 MG/KG	DISPOSITION	0	10/30/10	8:41	P	FOUND DEAD
81951-03	F	900 MG/KG	DISPOSITION	0	10/30/10	8:41	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81951-04	F	900 MG/KG	DISPOSITION	0	10/30/10	8:42	P	FOUND DEAD
81951-05	F	900 MG/KG	DISPOSITION	0	10/30/10	8:42	P	FOUND DEAD
81951-06	F	900 MG/KG	DISPOSITION	0	10/30/10	8:42	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81951-07	F	900 MG/KG	DISPOSITION	0	10/30/10	8:42	P	FOUND DEAD

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 54

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81951-08	U	900 MG/KG	DISPOSITION	0	10/30/10	8:43	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81951-09	M	900 MG/KG	DISPOSITION	1	10/31/10	6:41	P	MISSING
81951-10	M	900 MG/KG	DISPOSITION	1	10/31/10	6:42	P	MISSING
81951-11	F	900 MG/KG	DISPOSITION	1	10/31/10	6:42	P	MISSING
81955-01	M	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-01	M	900 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81955-02	M	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-02	M	900 MG/KG	DISPOSITION	4	11/02/10	9:35	P	SCHEDULED EUTHANASIA
81955-03	M	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-03	M	900 MG/KG	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81955-04	M	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-04	M	900 MG/KG	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81955-05	M	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-05	M	900 MG/KG	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81955-06	M	900 MG/KG	DISPOSITION	1	10/30/10	9:17	P	FOUND DEAD
81955-07	F	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-07	F	900 MG/KG	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81955-08	F	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-08	F	900 MG/KG	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81955-09	F	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-09	F	900 MG/KG	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 55

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81955-10	F	900 MG/KG	NORMAL	1	10/30/10	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81955-10	F	900 MG/KG	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81964-01	M	900 MG/KG	DISPOSITION	0	11/01/10	14:17	P	FOUND DEAD
81964-02	F	900 MG/KG	DISPOSITION	0	11/01/10	14:17	P	FOUND DEAD
81964-03	F	900 MG/KG	DISPOSITION	0	11/01/10	14:17	P	FOUND DEAD
81964-04	M	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-04	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:24	P	BODY COOL
81964-05	M	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-05	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:24	P	BODY COOL
81964-06	M	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-06	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:24	P	BODY COOL
81964-07	M	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-07	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:24	P	BODY COOL
81964-08	M	900 MG/KG	DISPOSITION	1	11/02/10	9:22	P	FOUND DEAD
81964-09	M	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-09	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:24	P	BODY COOL
81964-10	M	900 MG/KG	DISPOSITION	1	11/02/10	9:21	P	FOUND DEAD
81964-11	M	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-11	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:25	P	BODY COOL
81964-12	M	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-12	M	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:25	P	BODY COOL
81964-13	F	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-13	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:25	P	BODY COOL
81964-14	F	900 MG/KG	DISPOSITION	2	11/03/10	8:23	P	FOUND DEAD
81964-14	F	900 MG/KG	BODY/INTEGUMENT	1	11/02/10	9:25	P	BODY COOL
81968-01	M	900 MG/KG	DISPOSITION	0	10/31/10	13:08	P	FOUND DEAD
81968-02	F	900 MG/KG	DISPOSITION	0	10/31/10	13:08	P	FOUND DEAD

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 56

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81968-03	M	900 MG/KG	DISPOSITION	1	11/01/10	9:15	P	FOUND DEAD
81968-03	M	900 MG/KG	BODY/INTEGUMENT	0	10/31/10	13:09	P	BODY PALE
				0	10/31/10	13:09	P	BODY COOL
81968-04	M	900 MG/KG	DISPOSITION	1	11/01/10	9:15	P	FOUND DEAD
81968-04	M	900 MG/KG	BODY/INTEGUMENT	0	10/31/10	13:09	P	BODY COOL
81968-05	M	900 MG/KG	DISPOSITION	1	11/01/10	9:15	P	FOUND DEAD
81968-06	M	900 MG/KG	NORMAL	1	11/01/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81968-06	M	900 MG/KG	DISPOSITION	3	11/03/10	14:19	P	MISSING
81968-07	M	900 MG/KG	NORMAL	1	11/01/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81968-07	M	900 MG/KG	DISPOSITION	3	11/03/10	14:19	P	MISSING
81968-08	M	900 MG/KG	NORMAL	1	11/01/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81968-08	M	900 MG/KG	DISPOSITION	4	11/04/10	8:15	P	SCHEDULED EUTHANASIA
81968-08	M	900 MG/KG	BODY/INTEGUMENT	3	11/03/10	14:20	P	BODY COOL
				4	11/04/10	8:04	P	BODY COOL
81968-09	M	900 MG/KG	DISPOSITION	1	11/01/10	9:16	P	FOUND DEAD
81968-10	F	900 MG/KG	DISPOSITION	1	11/01/10	9:16	P	FOUND DEAD
81968-11	F	900 MG/KG	DISPOSITION	1	11/01/10	9:16	P	FOUND DEAD
81968-12	F	900 MG/KG	DISPOSITION	1	11/01/10	9:16	P	FOUND DEAD
81969-01	M	900 MG/KG	DISPOSITION	0	10/30/10	12:59	P	FOUND DEAD
81969-02	M	900 MG/KG	NORMAL	1	10/31/10	13:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-02	M	900 MG/KG	DISPOSITION	4	11/03/10	10:27	P	SCHEDULED EUTHANASIA
81969-03	M	900 MG/KG	NORMAL	1	10/31/10	13:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-03	M	900 MG/KG	DISPOSITION	4	11/03/10	10:27	P	SCHEDULED EUTHANASIA
81969-04	M	900 MG/KG	NORMAL	1	10/31/10	13:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-04	M	900 MG/KG	DISPOSITION	4	11/03/10	10:27	P	SCHEDULED EUTHANASIA
81969-05	M	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81969-05	M	900 MG/KG	NORMAL	4	11/03/10	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-05	M	900 MG/KG	DISPOSITION	4	11/03/10	10:27	P	SCHEDULED EUTHANASIA
81969-06	M	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-06	M	900 MG/KG	DISPOSITION	4	11/03/10	10:27	P	SCHEDULED EUTHANASIA
81969-07	M	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-07	M	900 MG/KG	DISPOSITION	4	11/03/10	10:27	P	SCHEDULED EUTHANASIA
81969-08	M	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-08	M	900 MG/KG	DISPOSITION	4	11/03/10	10:27	P	SCHEDULED EUTHANASIA
81969-09	F	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-09	F	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81969-10	F	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-10	F	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81969-11	F	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-11	F	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81969-12	F	900 MG/KG	NORMAL	1	10/31/10	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81969-12	F	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81973-01	M	900 MG/KG	DISPOSITION	1	10/31/10	8:56	P	FOUND DEAD
81973-02	M	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-02	M	900 MG/KG	DISPOSITION	3	11/02/10	14:32	P	MISSING
81973-03	M	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-03	M	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 58

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81973-04	M	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-04	M	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81973-05	M	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-05	M	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81973-06	M	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-06	M	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81973-07	F	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-07	F	900 MG/KG	DISPOSITION	4	11/03/10	9:50	P	MISSING
81973-08	F	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-08	F	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81973-09	F	900 MG/KG	NORMAL	1	10/31/10	13:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81973-09	F	900 MG/KG	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81980-01	M	900 MG/KG	DISPOSITION	1	11/03/10	6:48	P	FOUND DEAD
81980-02	M	900 MG/KG	DISPOSITION	1	11/03/10	14:39	P	MISSING
81980-02	M	900 MG/KG	CARDIO-PULMONARY	1	11/03/10	6:50	P	GASPING
81980-03	M	900 MG/KG	NORMAL	1	11/03/10	14:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-03	M	900 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81980-04	M	900 MG/KG	NORMAL	1	11/03/10	14:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-04	M	900 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81980-05	M	900 MG/KG	DISPOSITION	1	11/03/10	14:40	P	FOUND DEAD; PARTIALLY CANNIBALIZED
81980-06	M	900 MG/KG	NORMAL	1	11/03/10	14:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81980-06	M	900 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81980-07	M	900 MG/KG	NORMAL	1	11/03/10	14:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-07	M	900 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81980-08	F	900 MG/KG	NORMAL	1	11/03/10	14:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-08	F	900 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81980-09	M	900 MG/KG	NORMAL	1	11/03/10	14:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-09	M	900 MG/KG	DISPOSITION	4	11/06/10	7:31	P	SCHEDULED EUTHANASIA
81980-10	F	900 MG/KG	NORMAL	1	11/03/10	14:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-10	F	900 MG/KG	DISPOSITION	4	11/06/10	7:32	P	SCHEDULED EUTHANASIA
81980-11	F	900 MG/KG	NORMAL	1	11/03/10	14:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-11	F	900 MG/KG	DISPOSITION	4	11/06/10	7:32	P	SCHEDULED EUTHANASIA
81980-12	F	900 MG/KG	NORMAL	1	11/03/10	14:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/06/10	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81980-12	F	900 MG/KG	DISPOSITION	4	11/06/10	7:32	P	SCHEDULED EUTHANASIA
81928-01	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-01	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81928-02	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-02	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81928-03	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-03	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:22	P	SCHEDULED EUTHANASIA
81928-04	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81928-04	M	60 MG/KG CYC	NORMAL	4	11/01/10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-04	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-05	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-05	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-06	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-06	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-07	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-07	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-08	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-08	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-09	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-09	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-10	M	60 MG/KG CYC	NORMAL	1	10/29/10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-10	M	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-11	F	60 MG/KG CYC	NORMAL	1	10/29/10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-11	F	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81928-12	F	60 MG/KG CYC	NORMAL	1	10/29/10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-12	F	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:46	P	SCHEDULED EUTHANASIA
81928-13	F	60 MG/KG CYC	NORMAL	1	10/29/10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/01/10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81928-13	F	60 MG/KG CYC	DISPOSITION	4	11/01/10	9:23	P	SCHEDULED EUTHANASIA
81935-01	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81935-01	M	60 MG/KG CYC	NORMAL	4	11/03/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-01	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-02	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-02	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-03	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-03	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-04	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-04	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-05	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-05	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-06	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-06	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-07	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-07	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-08	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-08	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-09	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-09	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-10	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-10	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-11	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81935-11	F	60 MG/KG CYC	NORMAL	4	11/03/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-11	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81935-12	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81935-12	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81949-01	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-01	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81949-02	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-02	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81949-03	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-03	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81949-04	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-04	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81949-05	M	60 MG/KG CYC	NORMAL	1	10/31/10	14:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-05	M	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81949-06	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-06	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:28	P	SCHEDULED EUTHANASIA
81949-07	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-07	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81949-08	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-08	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A107 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP CLINICAL OBSERVATIONS

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81949-09	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-09	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81949-10	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-10	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81949-11	F	60 MG/KG CYC	NORMAL	1	10/31/10	14:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/03/10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81949-11	F	60 MG/KG CYC	DISPOSITION	4	11/03/10	10:29	P	SCHEDULED EUTHANASIA
81953-01	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-01	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-02	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-02	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-03	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-03	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-04	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-04	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-05	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-05	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-06	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-06	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-07	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81953-07	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-08	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-08	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-09	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-09	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-10	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-10	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-11	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-11	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-12	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-12	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81953-13	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81953-13	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA
81970-01	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-01	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-02	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-02	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-03	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-03	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-04	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

ANIMAL	SEX	GROUP	CATEGORY	PND	DATE	TIME	GRADE	OBSERVATIONS
81970-04	M	60 MG/KG CYC	NORMAL	4	11/02/10	8:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-04	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-05	M	60 MG/KG CYC	NORMAL	1	10/30/10	13:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-05	M	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-06	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-06	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-07	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-07	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-08	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-08	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-09	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-09	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-10	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-10	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-11	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-11	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-12	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-12	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:36	P	SCHEDULED EUTHANASIA
81970-13	F	60 MG/KG CYC	NORMAL	1	10/30/10	13:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11/02/10	8:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
81970-13	F	60 MG/KG CYC	DISPOSITION	4	11/02/10	9:37	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT PND = POSTNATAL DAY

TABLE A108 (F1)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL OFFSPRING WEIGHTS [G]

PUP NUMBER	SEX	POSTNATAL DAY 1	POSTNATAL DAY 4
DAMS FROM GROUP 1: SHAM CONTROL			
81924-01	M	6.3	6.8
81924-02	M	6.6	8.7
81924-03	M	7.0	9.1
81924-04	M	7.2	8.8
81924-05	M	7.0	8.8
81924-06	M	7.3	9.3
81924-07	M	6.2	7.8
81924-08	M	6.7	8.6
81924-09	M	6.7	7.5
81924-10	F	6.0	7.4
81924-11	F	6.6	8.8
81924-12	F	6.4	8.1
81924-13	F	5.7	6.8
81924-14	F	6.1	8.1
81924-15	F	6.3	7.6
MALES MEAN		6.8	8.4
FEMALES MEAN		6.2	7.8
81940-01	M	7.4	9.8
81940-02	M	8.1	10.3
81940-03	M	8.4	12.0
81940-04	M	7.7	11.2
81940-05	M	8.4	11.9
81940-06	M	8.2	9.7
81940-07	M	7.9	11.1

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 1: SHAM CONTROL			
81940-08	F	7.7	10.4
81940-09	F	8.7	11.3
81940-10	F	7.5	10.2
81940-11	F	8.0	11.3
81940-12	F	8.1	11.1
81940-13	F	8.1	11.6
MALES MEAN		8.0	10.9
FEMALES MEAN		8.0	11.0
81944-03	M	7.9	10.8
81944-04	M	7.9	10.3
81944-05	M	8.0	10.3
81944-06	M	7.8	11.1
81944-07	M	8.3	12.1
81944-08	M	7.7	10.6
81944-09	M	7.7	10.4
81944-10	M	7.1	9.2
81944-11	F	7.8	10.6
81944-12	F	7.3	9.0
81944-13	F	7.2	10.4

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 1: SHAM CONTROL			
81944-14	F	7.5	10.5
MALES MEAN		7.8	10.6
FEMALES MEAN		7.5	10.1
81952-01	M	5.9	8.2
81952-02	M	5.5	7.8
81952-03	M	5.7	7.9
81952-04	M	5.6	7.5
81952-05	M	5.2	NA
81952-06	M	6.1	8.3
81952-07	M	6.2	8.0
81952-08	M	5.9	7.5
81952-09	M	4.5	NA
81952-10	M	5.6	7.5
81952-11	M	5.8	7.7
81952-12	F	5.6	7.4
81952-13	F	5.5	8.0
81952-14	F	5.3	6.5
81952-15	F	4.4	NA
81952-16	F	4.9	NA
MALES MEAN		5.6	7.8
FEMALES MEAN		5.1	7.3
81963-01	M	6.4	7.3

NA = NOT APPLICABLE

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 1: SHAM CONTROL			
81963-02	M	5.2	NA
81963-03	M	5.8	7.4
81963-04	M	6.3	8.0
81963-05	M	5.3	NA
81963-06	M	5.8	NA
81963-07	M	5.8	6.0
81963-08	M	5.4	NA
81963-09	F	5.4	7.4
81963-10	F	5.9	7.8
81963-11	F	5.3	7.2
81963-12	F	5.8	NA
81963-13	F	5.0	NA
81963-14	F	5.5	7.7
81963-15	F	5.3	7.3
MALES MEAN		5.8	7.2
FEMALES MEAN		5.5	7.5
MALES MEAN		6.8	9.0
S.D.		1.10	1.67
S.E.		0.49	0.75
N		5	5
FEMALES MEAN		6.5	8.7
S.D.		1.25	1.69
S.E.		0.56	0.76
N		5	5

NA = NOT APPLICABLE

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 2: 0 MG/KG			
81920-01	M	7.0	9.2
81920-02	M	7.1	9.1
81920-03	M	7.5	9.8
81920-04	M	7.0	9.1
81920-05	M	6.5	8.4
81920-06	M	7.2	9.3
81920-07	M	7.0	9.1
81920-08	F	6.7	8.6
81920-09	F	6.4	8.6
81920-10	F	6.4	8.2
81920-11	F	6.7	8.2
81920-12	F	6.6	8.6
81920-13	F	7.1	9.4
MALES MEAN		7.0	9.1
FEMALES MEAN		6.7	8.6
81938-01	M	6.8	8.6
81938-02	M	6.3	8.4
81938-03	M	7.5	9.2
81938-04	M	7.1	9.4
81938-05	M	5.1	6.9
81938-06	M	6.8	9.2
81938-07	M	6.7	9.3
81938-08	M	7.7	10.2
81938-09	F	6.9	9.8

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 2: 0 MG/KG			
81938-10	F	6.5	8.5
81938-11	F	6.5	8.3
81938-12	F	7.1	9.6
81938-13	F	7.1	9.4
81938-14	F	6.9	9.2
81938-15	F	6.8	8.7
MALES MEAN		6.8	8.9
FEMALES MEAN		6.8	9.1
81939-01	M	6.9	10.1
81939-02	M	6.8	9.5
81939-03	M	7.1	9.4
81939-04	M	7.1	9.9
81939-05	M	6.7	9.7
81939-06	M	7.2	10.2
81939-07	M	6.9	9.8
81939-08	M	5.7	7.5
81939-09	M	7.8	10.3
81939-10	F	5.1	7.1
81939-11	F	6.7	9.8
81939-12	F	6.8	9.7
81939-13	F	6.4	8.7

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 2: 0 MG/KG			
81939-14	F	6.3	9.0
MALES MEAN		6.9	9.6
FEMALES MEAN		6.3	8.9
81942-01	M	6.5	9.0
81942-02	M	6.0	8.5
81942-03	M	5.5	7.6
81942-04	M	6.7	9.3
81942-05	M	6.8	9.6
81942-06	M	6.6	9.9
81942-07	M	6.4	9.0
81942-08	M	6.7	9.9
81942-09	M	6.0	8.7
81942-10	F	5.5	6.8
81942-11	F	6.6	9.4
81942-12	F	6.5	9.0
81942-13	F	6.0	8.0
81942-14	F	5.3	7.8
81942-15	F	5.8	8.9
MALES MEAN		6.4	9.1
FEMALES MEAN		6.0	8.3
81950-02	M	7.2	10.5
81950-03	M	8.3	13.1

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 2: 0 MG/KG			
81950-04	M	8.5	12.8
81950-05	M	8.7	13.5
81950-06	M	8.1	12.0
81950-07	M	8.1	12.2
81950-08	F	8.9	13.4
81950-09	F	8.1	12.2
81950-10	F	6.5	9.8
MALES MEAN		8.2	12.4
FEMALES MEAN		7.8	11.8
81958-01	M	6.7	9.0
81958-02	M	6.9	9.2
81958-03	M	7.1	10.3
81958-04	M	7.2	10.3
81958-05	M	7.2	9.8
81958-06	M	6.9	9.4
81958-07	M	7.1	9.9
81958-08	M	6.8	9.9
81958-09	F	6.7	8.1
81958-10	F	6.5	9.0
81958-11	F	6.7	9.2
81958-12	F	7.4	10.1
81958-13	F	7.2	9.7
81958-14	F	6.8	8.9
81958-15	F	6.1	8.4

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 2: 0 MG/KG			
81958-16	F	6.1	8.4
MALES MEAN		7.0	9.7
FEMALES MEAN		6.7	9.0
81967-01	M	6.3	9.0
81967-02	M	6.7	8.9
81967-03	M	6.8	9.2
81967-04	M	6.8	9.5
81967-05	M	6.4	8.9
81967-06	M	6.3	8.7
81967-07	M	6.1	8.4
81967-08	F	5.9	8.5
81967-09	F	6.3	9.5
81967-10	F	6.2	8.8
81967-11	F	5.9	8.1
81967-12	F	5.2	8.0
81967-13	F	5.6	7.9
81967-14	F	6.1	8.2
81967-15	F	5.8	8.8
81967-16	F	6.3	8.9
MALES MEAN		6.5	8.9
FEMALES MEAN		5.9	8.5
81975-01	M	7.8	10.6

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 2: 0 MG/KG			
81975-02	M	6.9	9.8
81975-03	M	7.1	9.9
81975-04	M	7.0	9.5
81975-05	M	6.4	9.1
81975-06	M	7.0	9.4
81975-07	M	7.1	9.3
81975-08	M	7.6	10.3
81975-09	F	6.6	9.1
81975-10	F	7.0	9.2
81975-11	F	6.7	9.5
81975-12	F	6.5	8.9
81975-13	F	6.5	8.6
MALES MEAN		7.1	9.7
FEMALES MEAN		6.7	9.1
81979-02	M	7.1	9.7
81979-03	M	6.8	9.7
81979-04	M	6.8	9.6
81979-05	M	7.2	10.5
81979-06	M	7.8	10.3
81979-07	M	6.7	9.4
81979-08	M	6.4	9.2
81979-09	M	7.0	10.1
81979-10	M	7.1	9.7
81979-11	M	6.8	9.5

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 2: 0 MG/KG			
81979-12	F	6.8	9.4
81979-13	F	6.4	9.3
81979-14	F	5.8	8.1
81979-15	F	5.7	8.3
MALES MEAN		7.0	9.8
FEMALES MEAN		6.2	8.8
MALES MEAN		7.0	9.7
S.D.		0.51	1.08
S.E.		0.17	0.36
N		9	9
FEMALES MEAN		6.6	9.1
S.D.		0.57	1.04
S.E.		0.19	0.35
N		9	9

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81915-01	M	7.8	10.4
81915-02	M	7.7	10.6
81915-03	M	8.4	11.7
81915-04	M	7.4	10.1
81915-05	M	6.9	9.4
81915-06	M	7.4	9.9
81915-07	M	7.2	9.4
81915-08	M	7.4	9.8
81915-09	F	5.8	7.4
81915-10	F	7.1	9.7
81915-11	F	7.2	9.8
81915-12	F	7.0	9.1
MALES MEAN		7.5	10.2
FEMALES MEAN		6.8	9.0
81916-01	M	6.7	9.7
81916-02	M	7.5	11.0
81916-03	M	7.0	9.9
81916-04	M	7.0	10.7
81916-05	M	7.2	10.7
81916-06	M	7.1	10.4
81916-07	F	6.8	10.4
81916-08	F	6.3	9.6
81916-09	F	6.3	9.3
81916-10	F	6.8	10.2

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81916-11	F	6.5	9.7
MALES MEAN		7.1	10.4
FEMALES MEAN		6.5	9.8
81917-01	M	6.1	8.4
81917-02	M	6.0	8.3
81917-03	M	6.2	8.7
81917-04	M	6.5	8.7
81917-05	M	6.1	8.5
81917-06	M	6.0	8.3
81917-07	M	5.6	8.3
81917-08	M	6.2	8.4
81917-09	F	6.2	8.7
81917-10	F	6.1	8.2
81917-11	F	6.2	8.4
81917-12	F	5.4	7.9
81917-13	F	5.6	7.3
MALES MEAN		6.1	8.5
FEMALES MEAN		5.9	8.1
81921-01	M	7.2	10.4
81921-02	M	7.1	10.8
81921-03	M	6.8	10.6
81921-04	M	6.3	9.7

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81921-05	M	6.8	10.0
81921-06	M	7.1	10.4
81921-07	M	7.5	10.7
81921-08	M	6.8	9.8
81921-09	M	7.1	10.6
81921-10	F	6.9	8.2
81921-11	F	7.1	10.6
81921-12	F	6.9	9.6
81921-13	F	6.4	9.4
MALES MEAN		7.0	10.3
FEMALES MEAN		6.8	9.5
81926-01	M	7.1	10.3
81926-02	M	7.3	10.4
81926-03	M	7.7	11.0
81926-04	M	7.6	10.4
81926-05	M	8.0	11.3
81926-06	M	7.6	11.0
81926-07	M	7.7	10.9
81926-08	F	7.5	10.7
81926-09	F	6.8	9.4
81926-10	F	7.8	10.7
81926-11	F	6.9	9.9

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81926-12	F	7.5	11.0
MALES MEAN		7.6	10.8
FEMALES MEAN		7.3	10.3
81930-01	M	6.3	8.6
81930-02	M	6.7	9.6
81930-03	M	6.6	8.8
81930-04	M	6.1	8.1
81930-05	M	6.0	8.0
81930-06	M	6.0	8.5
81930-07	F	5.7	8.0
81930-08	F	5.5	7.6
81930-09	F	6.5	9.5
81930-10	F	4.6	6.6
81930-11	F	5.8	8.1
81930-12	F	5.2	7.4
MALES MEAN		6.3	8.6
FEMALES MEAN		5.6	7.9
81941-01	M	7.3	9.6
81941-02	M	7.1	9.5
81941-03	M	6.0	8.0
81941-04	M	5.8	7.8
81941-05	M	6.6	8.8

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81941-06	F	6.7	9.3
81941-07	F	7.3	9.7
81941-08	F	6.8	9.7
81941-09	F	6.3	8.6
81941-10	F	6.8	9.2
81941-11	F	6.7	9.4
81941-12	F	6.1	8.4
81941-13	F	6.4	8.6
MALES MEAN		6.6	8.7
FEMALES MEAN		6.6	9.1
81960-01	M	5.4	6.8
81960-02	M	4.9	6.5
81960-03	M	4.6	6.4
81960-04	M	4.9	5.9
81960-05	M	5.6	7.3
81960-06	M	5.6	6.1
81960-07	F	5.7	6.7
81960-08	F	6.1	7.2
81960-09	F	5.0	6.3
81960-10	F	5.9	7.1
81960-11	F	5.3	6.8
81960-12	F	5.4	6.5
81960-13	F	5.1	6.5
81960-14	F	4.9	6.3

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81960-15	F	5.6	6.2
MALES MEAN		5.2	6.5
FEMALES MEAN		5.4	6.6
81961-01	M	7.6	11.0
81961-02	M	7.4	10.9
81961-03	M	6.7	9.9
81961-04	M	7.0	9.3
81961-05	M	7.1	10.1
81961-06	M	6.7	10.0
81961-07	F	7.3	10.9
81961-08	F	6.6	9.9
81961-09	F	6.9	9.8
81961-10	F	7.1	9.7
81961-11	F	7.1	10.4
81961-12	F	7.3	10.0
81961-13	F	6.7	8.7
81961-14	F	6.8	9.8
MALES MEAN		7.1	10.2
FEMALES MEAN		7.0	9.9
81962-01	M	6.3	9.0
81962-02	M	6.8	9.8
81962-03	M	7.9	10.8

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81962-04	M	6.6	8.9
81962-05	M	6.9	9.8
81962-06	M	6.9	10.0
81962-07	M	5.7	8.1
81962-08	F	6.6	9.8
81962-09	F	6.4	9.1
81962-10	F	6.7	9.4
81962-11	F	5.8	8.2
81962-12	F	6.3	8.8
81962-13	F	6.4	9.6
81962-14	F	5.8	8.5
MALES MEAN		6.7	9.5
FEMALES MEAN		6.3	9.1
81972-01	M	6.9	9.7
81972-02	M	6.8	9.6
81972-03	M	7.0	9.9
81972-04	M	7.2	10.5
81972-05	M	6.7	9.8
81972-06	M	6.6	9.8
81972-07	M	7.0	10.8
81972-08	F	6.9	9.8
81972-09	F	6.5	9.4
81972-10	F	7.2	10.7
81972-11	F	6.3	9.6

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 3: 100 MG/KG			
81972-12	F	6.3	9.0
81972-13	F	6.8	9.6
MALES MEAN		6.9	10.0
FEMALES MEAN		6.7	9.7
81978-01	M	6.3	8.8
81978-02	M	7.3	10.1
81978-03	M	6.1	8.7
81978-04	M	6.7	9.7
81978-05	M	6.3	9.2
81978-06	M	6.9	9.8
81978-07	M	6.8	9.5
81978-08	M	7.2	9.3
81978-09	F	7.0	9.9
81978-10	F	6.9	9.7
81978-11	F	6.9	9.5
81978-12	F	6.3	9.3
81978-13	F	6.4	8.7
MALES MEAN		6.7	9.4
FEMALES MEAN		6.7	9.4
MALES MEAN		6.7	9.4
S.D.		0.65	1.20
S.E.		0.19	0.35
N		12	12
FEMALES MEAN		6.5	9.0
S.D.		0.57	1.04
S.E.		0.16	0.30
N		12	12

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 4: 300 MG/KG			
81914-01	M	5.7	7.8
81914-02	M	6.2	8.9
81914-03	M	5.8	8.4
81914-04	M	5.8	8.3
81914-05	M	5.3	7.2
81914-06	M	5.4	7.4
81914-07	M	6.0	8.8
81914-08	M	6.2	8.8
81914-09	F	5.7	8.0
81914-10	F	5.5	8.0
81914-11	F	6.1	8.6
81914-12	F	5.5	7.8
81914-13	F	5.1	NA
81914-14	F	5.9	8.5
81914-15	F	5.5	7.7
MALES MEAN		5.8	8.2
FEMALES MEAN		5.6	8.1
81931-03	M	7.0	11.0
81931-04	M	6.8	10.5
81931-05	M	6.6	10.2
81931-06	M	7.3	11.5
81931-07	F	5.9	9.3
81931-08	F	6.1	9.3
81931-09	F	5.8	9.3

NA = NOT APPLICABLE

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 4: 300 MG/KG			
81931-10	F	6.5	10.2
81931-11	F	6.1	9.5
81931-12	F	6.1	9.3
81931-13	F	6.2	9.5
MALES MEAN		6.9	10.8
FEMALES MEAN		6.1	9.5
81934-01	M	6.4	4.9
81934-02	M	7.0	9.0
81934-03	M	6.6	7.2
81934-04	M	6.3	7.8
81934-05	M	7.6	10.3
81934-06	M	6.7	8.0
81934-07	F	6.9	8.6
81934-08	F	6.9	8.4
81934-09	F	5.9	6.8
81934-10	F	5.8	6.2
81934-11	F	6.2	7.8
MALES MEAN		6.8	7.9
FEMALES MEAN		6.3	7.6
81943-01	M	6.9	10.0
81943-02	M	7.8	10.4
81943-03	M	7.5	10.5

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 4: 300 MG/KG			
81943-04	M	7.2	9.5
81943-05	M	6.6	8.5
81943-06	M	7.3	9.9
81943-07	F	6.7	8.9
81943-08	F	6.6	9.7
81943-09	F	6.7	8.7
81943-10	F	6.9	8.8
81943-11	F	6.7	9.2
81943-12	F	6.7	9.7
MALES MEAN		7.2	9.8
FEMALES MEAN		6.7	9.2
81946-01	M	6.1	8.4
81946-02	M	5.3	8.0
81946-03	M	6.2	8.8
81946-04	M	6.3	9.8
81946-05	M	6.2	9.3
81946-06	M	6.1	9.1
81946-07	M	5.9	8.6
81946-08	M	6.8	9.7
81946-09	M	5.9	8.7
81946-10	M	4.9	7.3
81946-11	F	6.5	9.1

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 4: 300 MG/KG			
81946-12	F	6.2	8.9
MALES MEAN		6.0	8.8
FEMALES MEAN		6.4	9.0
81957-02	M	6.8	9.7
81957-03	M	7.5	10.4
81957-04	M	7.3	10.6
81957-05	M	7.0	9.8
81957-06	M	7.2	10.8
81957-07	M	6.6	9.0
81957-08	F	6.7	9.3
81957-09	M	7.1	10.3
81957-10	F	7.0	10.1
MALES MEAN		7.1	10.1
FEMALES MEAN		6.9	9.7
81959-01	M	7.0	10.0
81959-02	M	7.0	9.7
81959-03	M	7.3	9.9
81959-04	M	7.3	10.1
81959-05	M	6.9	9.7
81959-06	F	7.3	10.5
81959-07	F	7.1	9.9
81959-08	F	6.5	NA

NA = NOT APPLICABLE

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 4: 300 MG/KG			
81959-09	F	6.1	8.2
81959-10	F	6.8	8.9
81959-11	F	6.4	8.1
81959-12	F	6.1	8.1
81959-13	F	6.3	8.2
MALES MEAN		7.1	9.9
FEMALES MEAN		6.6	8.8
81974-09	M	6.2	8.7
81974-10	M	6.4	9.3
MALES MEAN		6.3	9.0
FEMALES MEAN			
81976-01	M	6.9	10.1
81976-02	M	7.1	10.3
81976-03	M	6.5	9.6
81976-04	M	7.0	10.6
81976-05	M	6.7	10.0
81976-06	M	6.4	8.8
81976-07	M	6.2	9.5
81976-08	M	6.7	9.6
81976-09	M	6.8	9.9
81976-10	M	6.3	9.5
81976-11	F	6.0	9.0

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 4: 300 MG/KG			
81976-12	F	6.0	9.1
81976-13	F	6.4	9.6
MALES MEAN		6.7	9.8
FEMALES MEAN		6.1	9.2
81977-01	M	7.3	9.7
81977-02	M	6.6	8.8
81977-03	M	6.8	9.4
81977-04	F	7.0	8.9
81977-05	F	6.4	8.2
81977-06	F	6.7	8.9
81977-07	F	6.3	7.9
81977-08	F	6.7	9.1
81977-09	F	7.1	8.9
81977-10	F	5.6	7.3
81977-11	F	6.9	8.5
MALES MEAN		6.9	9.3
FEMALES MEAN		6.6	8.5
MALES MEAN		6.7	9.4
S.D.		0.48	0.90
S.E.		0.15	0.28
N		10	10
FEMALES MEAN		6.4	8.8
S.D.		0.39	0.68
S.E.		0.13	0.23
N		9	9

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 5: 900 MG/KG			
81918-02	M	4.9	5.7
81918-03	M	5.6	7.0
81918-05	M	4.7	5.8
81918-06	M	4.8	6.0
81918-08	M	4.5	5.3
81918-09	M	4.2	4.3
81918-10	F	5.0	6.2
81918-11	F	3.9	4.5
81918-12	F	5.2	6.5
81918-13	F	4.9	5.8
81918-14	F	4.1	4.0
81918-15	F	3.9	3.6
81918-16	F	4.8	6.0
MALES MEAN		4.8	5.7
FEMALES MEAN		4.5	5.2
81919-01	M	5.9	7.8
81919-02	M	5.7	7.8
81919-03	M	6.3	8.1
81919-04	M	5.9	7.9
81919-05	M	6.3	8.6
81919-06	M	6.2	8.3
81919-07	M	6.3	8.8
81919-08	M	5.7	7.6

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 5: 900 MG/KG			
81919-09	F	5.9	8.0
MALES MEAN		6.0	8.1
FEMALES MEAN		5.9	8.0
81927-01	M	5.0	7.1
81927-02	M	5.4	7.3
81927-03	M	5.1	7.2
81927-04	M	5.3	7.7
81927-05	M	5.7	7.3
81927-06	M	5.1	7.5
81927-07	F	4.5	6.4
81927-08	F	5.2	7.6
81927-09	F	4.5	6.2
MALES MEAN		5.3	7.4
FEMALES MEAN		4.7	6.7
81936-01	M	5.9	8.1
81936-02	M	5.7	8.1
81936-03	M	6.1	8.8
81936-04	M	5.1	6.8
81936-05	M	5.6	7.5
81936-06	M	5.8	7.9
81936-07	M	5.1	6.6
81936-08	M	5.8	7.8

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 5: 900 MG/KG			
81936-09	F	5.3	7.1
81936-10	F	5.7	7.8
81936-11	F	5.3	6.8
81936-12	F	4.5	5.8
81936-13	F	5.5	7.6
81936-14	F	5.1	6.8
MALES MEAN		5.6	7.7
FEMALES MEAN		5.2	7.0
81937-01	F	8.2	9.3
MALES MEAN			
FEMALES MEAN		8.2	9.3
81955-01	M	6.8	8.5
81955-02	M	7.0	9.0
81955-03	M	6.0	8.0
81955-04	M	6.5	8.5
81955-05	M	6.0	8.0
81955-07	F	5.3	6.8
81955-08	F	6.1	8.1
81955-09	F	6.5	7.9

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 5: 900 MG/KG			
81955-10	F	5.7	7.1
MALES MEAN		6.5	8.4
FEMALES MEAN		5.9	7.5
81964-04	M	4.6	NA
81964-05	M	4.6	NA
81964-06	M	5.0	NA
81964-07	M	4.8	NA
81964-09	M	5.0	NA
81964-11	M	5.0	NA
81964-12	M	4.7	NA
81964-13	F	4.5	NA
81964-14	F	4.2	NA
MALES MEAN		4.8	
FEMALES MEAN		4.4	
81968-06	M	4.5	NA
81968-07	M	4.7	NA
81968-08	M	5.1	4.6
MALES MEAN		4.8	4.6
FEMALES MEAN			
81969-02	M	6.5	8.6

NA = NOT APPLICABLE

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 5: 900 MG/KG			
81969-03	M	7.0	8.8
81969-04	M	7.0	9.0
81969-05	M	6.9	8.7
81969-06	M	7.0	9.8
81969-07	M	6.9	8.7
81969-08	M	6.8	8.9
81969-09	F	6.7	9.1
81969-10	F	6.1	7.5
81969-11	F	6.6	9.0
81969-12	F	6.2	8.8
MALES MEAN		6.9	8.9
FEMALES MEAN		6.4	8.6
81973-02	M	5.5	NA
81973-03	M	5.4	4.6
81973-04	M	6.2	6.5
81973-05	M	5.8	5.8
81973-06	M	5.3	5.0
81973-07	F	4.3	NA
81973-08	F	5.4	5.0

NA = NOT APPLICABLE

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 5: 900 MG/KG			
81973-09	F	5.9	5.0
MALES MEAN		5.6	5.5
FEMALES MEAN		5.2	5.0
81980-03	M	6.6	9.0
81980-04	M	6.6	7.8
81980-06	M	6.6	8.8
81980-07	M	6.7	8.9
81980-08	F	6.0	8.2
81980-09	M	5.7	8.0
81980-10	F	6.0	8.1
81980-11	F	6.0	8.3
81980-12	F	6.0	7.7
MALES MEAN		6.4	8.5
FEMALES MEAN		6.0	8.1
MALES MEAN		5.7	7.2
S.D.		0.76	1.54
S.E.		0.24	0.51
N		10	9
FEMALES MEAN		5.6	7.3
S.D.		1.13	1.46
S.E.		0.36	0.49
N		10	9

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 6: 60 MG/KG CYC			
81928-01	M	7.1	9.5
81928-02	M	6.3	8.5
81928-03	M	6.0	8.3
81928-04	M	6.2	8.7
81928-05	M	5.7	7.4
81928-06	M	6.4	9.3
81928-07	M	6.4	10.2
81928-08	M	6.9	9.9
81928-09	M	6.5	8.8
81928-10	M	6.5	8.8
81928-11	F	5.8	8.0
81928-12	F	6.2	8.7
81928-13	F	6.0	8.1
MALES MEAN		6.4	8.9
FEMALES MEAN		6.0	8.3
81935-01	M	6.9	10.3
81935-02	M	6.0	7.7
81935-03	M	7.2	9.8
81935-04	M	6.3	8.5
81935-05	F	5.8	7.9
81935-06	F	7.0	10.0
81935-07	F	6.7	9.5
81935-08	F	7.0	9.8
81935-09	F	6.9	9.6

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 6: 60 MG/KG CYC			
81935-10	F	7.4	10.6
81935-11	F	6.3	8.0
81935-12	F	7.0	9.4
MALES MEAN		6.6	9.1
FEMALES MEAN		6.8	9.4
81949-01	M	7.2	10.8
81949-02	M	7.1	10.0
81949-03	M	7.0	9.9
81949-04	M	7.3	10.2
81949-05	M	6.8	9.7
81949-06	F	6.5	9.3
81949-07	F	6.8	9.3
81949-08	F	6.9	10.1
81949-09	F	6.6	9.5
81949-10	F	6.5	9.0
81949-11	F	7.1	10.0
MALES MEAN		7.1	10.1
FEMALES MEAN		6.7	9.5
81953-01	M	6.0	6.2
81953-02	M	6.8	7.7
81953-03	M	6.5	8.0
81953-04	M	6.7	7.5

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 6: 60 MG/KG CYC			
81953-05	M	6.2	7.1
81953-06	M	6.0	7.8
81953-07	M	6.6	8.1
81953-08	F	5.8	6.7
81953-09	F	5.9	7.2
81953-10	F	5.9	7.0
81953-11	F	5.4	5.8
81953-12	F	5.8	6.3
81953-13	F	5.9	7.1
MALES MEAN		6.4	7.5
FEMALES MEAN		5.8	6.7
81970-01	M	7.2	10.0
81970-02	M	6.6	8.8
81970-03	M	6.1	7.9
81970-04	M	6.9	9.2
81970-05	M	6.6	8.9
81970-06	F	6.3	8.5
81970-07	F	6.6	9.4
81970-08	F	6.2	8.4
81970-09	F	6.4	8.9
81970-10	F	5.9	8.0
81970-11	F	6.2	8.2
81970-12	F	6.4	8.6

PUP NUMBER	SEX	POSTNATAL DAY 1	4
DAMS FROM GROUP 6: 60 MG/KG CYC			
81970-13	F	6.6	8.3
MALES MEAN		6.7	9.0
FEMALES MEAN		6.3	8.5
MALES MEAN		6.6	8.9
S.D.		0.29	0.93
S.E.		0.13	0.42
N		5	5
FEMALES MEAN		6.3	8.5
S.D.		0.43	1.13
S.E.		0.19	0.50
N		5	5

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 1: SHAM CONTROL		
81924-01	M	0.5
81924-02	M	2.1
81924-03	M	2.1
81924-04	M	1.6
81924-05	M	1.8
81924-06	M	2.0
81924-07	M	1.6
81924-08	M	1.9
81924-09	M	0.8
81924-10	F	1.4
81924-11	F	2.2
81924-12	F	1.7
81924-13	F	1.1
81924-14	F	2.0
81924-15	F	1.3
MALES MEAN		1.6
FEMALES MEAN		1.6
81940-01	M	2.4
81940-02	M	2.2
81940-03	M	3.6
81940-04	M	3.5
81940-05	M	3.5
81940-06	M	1.5
81940-07	M	3.2

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 1: SHAM CONTROL		
81940-08	F	2.7
81940-09	F	2.6
81940-10	F	2.7
81940-11	F	3.3
81940-12	F	3.0
81940-13	F	3.5
MALES MEAN		2.8
FEMALES MEAN		3.0
81944-03	M	2.9
81944-04	M	2.4
81944-05	M	2.3
81944-06	M	3.3
81944-07	M	3.8
81944-08	M	2.9
81944-09	M	2.7
81944-10	M	2.1
81944-11	F	2.8
81944-12	F	1.7
81944-13	F	3.2

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 1: SHAM CONTROL		
81944-14	F	3.0
MALES MEAN		2.8
FEMALES MEAN		2.7
81952-01	M	2.3
81952-02	M	2.3
81952-03	M	2.2
81952-04	M	1.9
81952-06	M	2.2
81952-07	M	1.8
81952-08	M	1.6
81952-10	M	1.9
81952-11	M	1.9
81952-12	F	1.8
81952-13	F	2.5
81952-14	F	1.2
MALES MEAN		2.0
FEMALES MEAN		1.8
81963-01	M	0.9
81963-03	M	1.6
81963-04	M	1.7
81963-07	M	0.2
81963-09	F	2.0

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 1: SHAM CONTROL		
81963-10	F	1.9
81963-11	F	1.9
81963-14	F	2.2
81963-15	F	2.0
MALES MEAN		1.1
FEMALES MEAN		2.0
MALES MEAN		2.1
S.D.		0.75
S.E.		0.33
N		5
FEMALES MEAN		2.2
S.D.		0.60
S.E.		0.27
N		5

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 2: 0 MG/KG		
81920-01	M	2.2
81920-02	M	2.0
81920-03	M	2.3
81920-04	M	2.1
81920-05	M	1.9
81920-06	M	2.1
81920-07	M	2.1
81920-08	F	1.9
81920-09	F	2.2
81920-10	F	1.8
81920-11	F	1.5
81920-12	F	2.0
81920-13	F	2.3
MALES MEAN		2.1
FEMALES MEAN		2.0
81938-01	M	1.8
81938-02	M	2.1
81938-03	M	1.7
81938-04	M	2.3
81938-05	M	1.8
81938-06	M	2.4
81938-07	M	2.6
81938-08	M	2.5
81938-09	F	2.9

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 2: 0 MG/KG		
81938-10	F	2.0
81938-11	F	1.8
81938-12	F	2.5
81938-13	F	2.3
81938-14	F	2.3
81938-15	F	1.9
MALES MEAN		2.2
FEMALES MEAN		2.2
81939-01	M	3.2
81939-02	M	2.7
81939-03	M	2.3
81939-04	M	2.8
81939-05	M	3.0
81939-06	M	3.0
81939-07	M	2.9
81939-08	M	1.8
81939-09	M	2.5
81939-10	F	2.0
81939-11	F	3.1
81939-12	F	2.9
81939-13	F	2.3

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 2: 0 MG/KG		
81939-14	F	2.7
MALES MEAN		2.7
FEMALES MEAN		2.6
81942-01	M	2.5
81942-02	M	2.5
81942-03	M	2.1
81942-04	M	2.6
81942-05	M	2.8
81942-06	M	3.3
81942-07	M	2.6
81942-08	M	3.2
81942-09	M	2.7
81942-10	F	1.3
81942-11	F	2.8
81942-12	F	2.5
81942-13	F	2.0
81942-14	F	2.5
81942-15	F	3.1
MALES MEAN		2.7
FEMALES MEAN		2.4
81950-02	M	3.3
81950-03	M	4.8

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 2: 0 MG/KG		
81950-04	M	4.3
81950-05	M	4.8
81950-06	M	3.9
81950-07	M	4.1
81950-08	F	4.5
81950-09	F	4.1
81950-10	F	3.3
MALES MEAN		4.2
FEMALES MEAN		4.0
81958-01	M	2.3
81958-02	M	2.3
81958-03	M	3.2
81958-04	M	3.1
81958-05	M	2.6
81958-06	M	2.5
81958-07	M	2.8
81958-08	M	3.1
81958-09	F	1.4
81958-10	F	2.5
81958-11	F	2.5
81958-12	F	2.7
81958-13	F	2.5
81958-14	F	2.1
81958-15	F	2.3

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 2: 0 MG/KG		
81958-16	F	2.3
MALES MEAN		2.7
FEMALES MEAN		2.3
81967-01	M	2.7
81967-02	M	2.2
81967-03	M	2.4
81967-04	M	2.7
81967-05	M	2.5
81967-06	M	2.4
81967-07	M	2.3
81967-08	F	2.6
81967-09	F	3.2
81967-10	F	2.6
81967-11	F	2.2
81967-12	F	2.8
81967-13	F	2.3
81967-14	F	2.1
81967-15	F	3.0
81967-16	F	2.6
MALES MEAN		2.5
FEMALES MEAN		2.6
81975-01	M	2.8

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 2: 0 MG/KG		
81975-02	M	2.9
81975-03	M	2.8
81975-04	M	2.5
81975-05	M	2.7
81975-06	M	2.4
81975-07	M	2.2
81975-08	M	2.7
81975-09	F	2.5
81975-10	F	2.2
81975-11	F	2.8
81975-12	F	2.4
81975-13	F	2.1
MALES MEAN		2.6
FEMALES MEAN		2.4
81979-02	M	2.6
81979-03	M	2.9
81979-04	M	2.8
81979-05	M	3.3
81979-06	M	2.5
81979-07	M	2.7
81979-08	M	2.8
81979-09	M	3.1
81979-10	M	2.6
81979-11	M	2.7

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 2: 0 MG/KG		
81979-12	F	2.6
81979-13	F	2.9
81979-14	F	2.3
81979-15	F	2.6
MALES MEAN		2.8
FEMALES MEAN		2.6
MALES MEAN		2.7
S.D.		0.60
S.E.		0.20
N		9
FEMALES MEAN		2.6
S.D.		0.57
S.E.		0.19
N		9

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81915-01	M	2.6
81915-02	M	2.9
81915-03	M	3.3
81915-04	M	2.7
81915-05	M	2.5
81915-06	M	2.5
81915-07	M	2.2
81915-08	M	2.4
81915-09	F	1.6
81915-10	F	2.6
81915-11	F	2.6
81915-12	F	2.1
MALES MEAN		2.6
FEMALES MEAN		2.2
81916-01	M	3.0
81916-02	M	3.5
81916-03	M	2.9
81916-04	M	3.7
81916-05	M	3.5
81916-06	M	3.3
81916-07	F	3.6
81916-08	F	3.3
81916-09	F	3.0
81916-10	F	3.4

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81916-11	F	3.2
MALES MEAN		3.3
FEMALES MEAN		3.3
81917-01	M	2.3
81917-02	M	2.3
81917-03	M	2.5
81917-04	M	2.2
81917-05	M	2.4
81917-06	M	2.3
81917-07	M	2.7
81917-08	M	2.2
81917-09	F	2.5
81917-10	F	2.1
81917-11	F	2.2
81917-12	F	2.5
81917-13	F	1.7
MALES MEAN		2.4
FEMALES MEAN		2.2
81921-01	M	3.2
81921-02	M	3.7
81921-03	M	3.8
81921-04	M	3.4

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81921-05	M	3.2
81921-06	M	3.3
81921-07	M	3.2
81921-08	M	3.0
81921-09	M	3.5
81921-10	F	1.3
81921-11	F	3.5
81921-12	F	2.7
81921-13	F	3.0
MALES MEAN		3.4
FEMALES MEAN		2.6
81926-01	M	3.2
81926-02	M	3.1
81926-03	M	3.3
81926-04	M	2.8
81926-05	M	3.3
81926-06	M	3.4
81926-07	M	3.2
81926-08	F	3.2
81926-09	F	2.6
81926-10	F	2.9
81926-11	F	3.0

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81926-12	F	3.5
MALES MEAN		3.2
FEMALES MEAN		3.0
81930-01	M	2.3
81930-02	M	2.9
81930-03	M	2.2
81930-04	M	2.0
81930-05	M	2.0
81930-06	M	2.5
81930-07	F	2.3
81930-08	F	2.1
81930-09	F	3.0
81930-10	F	2.0
81930-11	F	2.3
81930-12	F	2.2
MALES MEAN		2.3
FEMALES MEAN		2.3
81941-01	M	2.3
81941-02	M	2.4
81941-03	M	2.0
81941-04	M	2.0
81941-05	M	2.2

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81941-06	F	2.6
81941-07	F	2.4
81941-08	F	2.9
81941-09	F	2.3
81941-10	F	2.4
81941-11	F	2.7
81941-12	F	2.3
81941-13	F	2.2
MALES MEAN		2.2
FEMALES MEAN		2.5
81960-01	M	1.4
81960-02	M	1.6
81960-03	M	1.8
81960-04	M	1.0
81960-05	M	1.7
81960-06	M	0.5
81960-07	F	1.0
81960-08	F	1.1
81960-09	F	1.3
81960-10	F	1.2
81960-11	F	1.5
81960-12	F	1.1
81960-13	F	1.4
81960-14	F	1.4

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81960-15	F	0.6
MALES MEAN		1.3
FEMALES MEAN		1.2
81961-01	M	3.4
81961-02	M	3.5
81961-03	M	3.2
81961-04	M	2.3
81961-05	M	3.0
81961-06	M	3.3
81961-07	F	3.6
81961-08	F	3.3
81961-09	F	2.9
81961-10	F	2.6
81961-11	F	3.3
81961-12	F	2.7
81961-13	F	2.0
81961-14	F	3.0
MALES MEAN		3.1
FEMALES MEAN		2.9
81962-01	M	2.7
81962-02	M	3.0
81962-03	M	2.9

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81962-04	M	2.3
81962-05	M	2.9
81962-06	M	3.1
81962-07	M	2.4
81962-08	F	3.2
81962-09	F	2.7
81962-10	F	2.7
81962-11	F	2.4
81962-12	F	2.5
81962-13	F	3.2
81962-14	F	2.7
MALES MEAN		2.8
FEMALES MEAN		2.8
81972-01	M	2.8
81972-02	M	2.8
81972-03	M	2.9
81972-04	M	3.3
81972-05	M	3.1
81972-06	M	3.2
81972-07	M	3.8
81972-08	F	2.9
81972-09	F	2.9
81972-10	F	3.5
81972-11	F	3.3

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 3: 100 MG/KG		
81972-12	F	2.7
81972-13	F	2.8
MALES MEAN		3.1
FEMALES MEAN		3.0
81978-01	M	2.5
81978-02	M	2.8
81978-03	M	2.6
81978-04	M	3.0
81978-05	M	2.9
81978-06	M	2.9
81978-07	M	2.7
81978-08	M	2.1
81978-09	F	2.9
81978-10	F	2.8
81978-11	F	2.6
81978-12	F	3.0
81978-13	F	2.3
MALES MEAN		2.7
FEMALES MEAN		2.7
MALES MEAN		2.7
S.D.		0.60
S.E.		0.17
N		12
FEMALES MEAN		2.6
S.D.		0.55
S.E.		0.16
N		12

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 4: 300 MG/KG		
81914-01	M	2.1
81914-02	M	2.7
81914-03	M	2.6
81914-04	M	2.5
81914-05	M	1.9
81914-06	M	2.0
81914-07	M	2.8
81914-08	M	2.6
81914-09	F	2.3
81914-10	F	2.5
81914-11	F	2.5
81914-12	F	2.3
81914-14	F	2.6
81914-15	F	2.2
MALES MEAN		2.4
FEMALES MEAN		2.4
81931-03	M	4.0
81931-04	M	3.7
81931-05	M	3.6
81931-06	M	4.2
81931-07	F	3.4
81931-08	F	3.2
81931-09	F	3.5
81931-10	F	3.7

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 4: 300 MG/KG		
81931-11	F	3.4
81931-12	F	3.2
81931-13	F	3.3
MALES MEAN		3.9
FEMALES MEAN		3.4
81934-01	M	-1.5
81934-02	M	2.0
81934-03	M	0.6
81934-04	M	1.5
81934-05	M	2.7
81934-06	M	1.3
81934-07	F	1.7
81934-08	F	1.5
81934-09	F	0.9
81934-10	F	0.4
81934-11	F	1.6
MALES MEAN		1.1
FEMALES MEAN		1.2
81943-01	M	3.1
81943-02	M	2.6
81943-03	M	3.0
81943-04	M	2.3

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 4: 300 MG/KG		
81943-05	M	1.9
81943-06	M	2.6
81943-07	F	2.2
81943-08	F	3.1
81943-09	F	2.0
81943-10	F	1.9
81943-11	F	2.5
81943-12	F	3.0
MALES MEAN		2.6
FEMALES MEAN		2.5
81946-01	M	2.3
81946-02	M	2.7
81946-03	M	2.6
81946-04	M	3.5
81946-05	M	3.1
81946-06	M	3.0
81946-07	M	2.7
81946-08	M	2.9
81946-09	M	2.8
81946-10	M	2.4
81946-11	F	2.6

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 4: 300 MG/KG		
81946-12	F	2.7
MALES MEAN		2.8
FEMALES MEAN		2.7
81957-02	M	2.9
81957-03	M	2.9
81957-04	M	3.3
81957-05	M	2.8
81957-06	M	3.6
81957-07	M	2.4
81957-08	F	2.6
81957-09	M	3.2
81957-10	F	3.1
MALES MEAN		3.0
FEMALES MEAN		2.9
81959-01	M	3.0
81959-02	M	2.7
81959-03	M	2.6
81959-04	M	2.8
81959-05	M	2.8
81959-06	F	3.2
81959-07	F	2.8
81959-09	F	2.1

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 4: 300 MG/KG		
81959-10	F	2.1
81959-11	F	1.7
81959-12	F	2.0
81959-13	F	1.9
MALES MEAN		2.8
FEMALES MEAN		2.3
81974-09	M	2.5
81974-10	M	2.9
MALES MEAN		2.7
FEMALES MEAN		
81976-01	M	3.2
81976-02	M	3.2
81976-03	M	3.1
81976-04	M	3.6
81976-05	M	3.3
81976-06	M	2.4
81976-07	M	3.3
81976-08	M	2.9
81976-09	M	3.1
81976-10	M	3.2
81976-11	F	3.0
81976-12	F	3.1

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 4: 300 MG/KG		
81976-13	F	3.2
MALES MEAN		3.1
FEMALES MEAN		3.1
81977-01	M	2.4
81977-02	M	2.2
81977-03	M	2.6
81977-04	F	1.9
81977-05	F	1.8
81977-06	F	2.2
81977-07	F	1.6
81977-08	F	2.4
81977-09	F	1.8
81977-10	F	1.7
81977-11	F	1.6
MALES MEAN		2.4
FEMALES MEAN		1.9
MALES MEAN		2.7
S.D.		0.70
S.E.		0.22
N		10
FEMALES MEAN		2.5
S.D.		0.66
S.E.		0.22
N		9

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 5: 900 MG/KG		
81918-02	M	0.8
81918-03	M	1.4
81918-05	M	1.1
81918-06	M	1.2
81918-08	M	0.8
81918-09	M	0.1
81918-10	F	1.2
81918-11	F	0.6
81918-12	F	1.3
81918-13	F	0.9
81918-14	F	-0.1
81918-15	F	-0.3
81918-16	F	1.2
MALES MEAN		0.9
FEMALES MEAN		0.7
81919-01	M	1.9
81919-02	M	2.1
81919-03	M	1.8
81919-04	M	2.0
81919-05	M	2.3
81919-06	M	2.1
81919-07	M	2.5
81919-08	M	1.9

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 5: 900 MG/KG		
81919-09	F	2.1
MALES MEAN		2.1
FEMALES MEAN		2.1
81927-01	M	2.1
81927-02	M	1.9
81927-03	M	2.1
81927-04	M	2.4
81927-05	M	1.6
81927-06	M	2.4
81927-07	F	1.9
81927-08	F	2.4
81927-09	F	1.7
MALES MEAN		2.1
FEMALES MEAN		2.0
81936-01	M	2.2
81936-02	M	2.4
81936-03	M	2.7
81936-04	M	1.7
81936-05	M	1.9
81936-06	M	2.1
81936-07	M	1.5
81936-08	M	2.0

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 5: 900 MG/KG		
81936-09	F	1.8
81936-10	F	2.1
81936-11	F	1.5
81936-12	F	1.3
81936-13	F	2.1
81936-14	F	1.7
MALES MEAN		2.1
FEMALES MEAN		1.8
81937-01	F	1.1
MALES MEAN		
FEMALES MEAN		1.1
81955-01	M	1.7
81955-02	M	2.0
81955-03	M	2.0
81955-04	M	2.0
81955-05	M	2.0
81955-07	F	1.5
81955-08	F	2.0
81955-09	F	1.4

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 5: 900 MG/KG		
81955-10	F	1.4
MALES MEAN		1.9
FEMALES MEAN		1.6
81968-08	M	-0.5
MALES MEAN		-0.5
FEMALES MEAN		
81969-02	M	2.1
81969-03	M	1.8
81969-04	M	2.0
81969-05	M	1.8
81969-06	M	2.8
81969-07	M	1.8
81969-08	M	2.1
81969-09	F	2.4
81969-10	F	1.4
81969-11	F	2.4
81969-12	F	2.6
MALES MEAN		2.1
FEMALES MEAN		2.2
81973-03	M	-0.8

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 5: 900 MG/KG		
81973-04	M	0.3
81973-05	M	0.0
81973-06	M	-0.3
81973-08	F	-0.4
81973-09	F	-0.9
MALES MEAN		-0.2
FEMALES MEAN		-0.7
81980-03	M	2.4
81980-04	M	1.2
81980-06	M	2.2
81980-07	M	2.2
81980-08	F	2.2
81980-09	M	2.3
81980-10	F	2.1
81980-11	F	2.3
81980-12	F	1.7
MALES MEAN		2.1
FEMALES MEAN		2.1
MALES MEAN		1.4
S.D.		1.07
S.E.		0.36
N		9
FEMALES MEAN		1.4
S.D.		0.95
S.E.		0.32
N		9

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 6: 60 MG/KG CYC		
81928-01	M	2.4
81928-02	M	2.2
81928-03	M	2.3
81928-04	M	2.5
81928-05	M	1.7
81928-06	M	2.9
81928-07	M	3.8
81928-08	M	3.0
81928-09	M	2.3
81928-10	M	2.3
81928-11	F	2.2
81928-12	F	2.5
81928-13	F	2.1
MALES MEAN		2.5
FEMALES MEAN		2.3
81935-01	M	3.4
81935-02	M	1.7
81935-03	M	2.6
81935-04	M	2.2
81935-05	F	2.1
81935-06	F	3.0
81935-07	F	2.8
81935-08	F	2.8
81935-09	F	2.7

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 6: 60 MG/KG CYC		
81935-10	F	3.2
81935-11	F	1.7
81935-12	F	2.4
MALES MEAN		2.5
FEMALES MEAN		2.6
81949-01	M	3.6
81949-02	M	2.9
81949-03	M	2.9
81949-04	M	2.9
81949-05	M	2.9
81949-06	F	2.8
81949-07	F	2.5
81949-08	F	3.2
81949-09	F	2.9
81949-10	F	2.5
81949-11	F	2.9
MALES MEAN		3.0
FEMALES MEAN		2.8
81953-01	M	0.2
81953-02	M	0.9
81953-03	M	1.5
81953-04	M	0.8

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 6: 60 MG/KG CYC		
81953-05	M	0.9
81953-06	M	1.8
81953-07	M	1.5
81953-08	F	0.9
81953-09	F	1.3
81953-10	F	1.1
81953-11	F	0.4
81953-12	F	0.5
81953-13	F	1.2
MALES MEAN		1.1
FEMALES MEAN		0.9
81970-01	M	2.8
81970-02	M	2.2
81970-03	M	1.8
81970-04	M	2.3
81970-05	M	2.3
81970-06	F	2.2
81970-07	F	2.8
81970-08	F	2.2
81970-09	F	2.5
81970-10	F	2.1
81970-11	F	2.0
81970-12	F	2.2

PUP NUMBER	SEX	POSTNATAL DAY 1- 4
DAMS FROM GROUP 6: 60 MG/KG CYC		
81970-13	F	1.7
MALES MEAN		2.3
FEMALES MEAN		2.2
MALES MEAN		2.3
S.D.		0.71
S.E.		0.32
N		5
FEMALES MEAN		2.2
S.D.		0.74
S.E.		0.33
N		5

TABLE A110 (F1 - UNSCHEDULED DEATHS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP NECROPSY FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	PUP NO.	SEX	LACT DAY	TISSUE	GROUP 1: SHAM CONTROL FINDING	GRADE
81944	1	M	0	LUNGS	DID NOT FLOAT	P
				STOMACH	MILK NOT PRESENT	P
	2	F	0	LUNGS	DID NOT FLOAT	P
				STOMACH	MILK NOT PRESENT	P
81963	2	M	2	GENERAL COMMENT	CANNIBALIZED	P
	8	M	2	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	12	F	4	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	13	F	2	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE CRANIAL, THORACIC, ABDOMINAL AND URINARY/REPRODUCTIVE	P

GRADE CODE: 1 - SLIGHT, 2 - MODERATE, 3 - MARKED, P - PRESENT

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

PUP NO.	SEX	LACT DAY	TISSUE	GROUP 2: 0 MG/KG FINDING	GRADE
81979	1 M	0	STOMACH	MILK NOT PRESENT	P
			LUNGS	DID NOT FLOAT	P

GRADE CODE: 1 - SLIGHT, 2 - MODERATE, 3 - MARKED, P - PRESENT

TABLE A110 (F1 - UNSCHEDULED DEATHS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP NECROPSY FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	PUP NO.	SEX	LACT DAY	TISSUE	GROUP 4: 300 MG/KG FINDING	GRADE
81914	13	F	3		NO REMARKABLE OBSERVATIONS	
81931	1	M	0	GENERAL COMMENT	CANNIBALIZED FORELIMB, LEFT	P
				GENERAL COMMENT	EUTHANIZED IN EXTREMIS	P
				STOMACH	MILK PRESENT	P
81957	1	M	0	LUNGS	DID NOT FLOAT	P
				STOMACH	MILK NOT PRESENT	P
81959	8	F	4		NO REMARKABLE OBSERVATIONS	
81974	1	M	0	LUNGS	DID NOT FLOAT	P
				GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	2	M	0	LUNGS	DID NOT FLOAT	P
				GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	3	F	0	LUNGS	DID NOT FLOAT	P
				STOMACH	MILK NOT PRESENT	P
	4	F	0	LUNGS	DID FLOAT	P
				STOMACH	MILK NOT PRESENT	P
	5	F	0	GENERAL COMMENT	CANNIBALIZED	P
	6	F	0	LUNGS	DID NOT FLOAT	P
				STOMACH	MILK NOT PRESENT	P
	7	U	0	GENERAL COMMENT	CANNIBALIZED	P
	8	U	0	GENERAL COMMENT	CANNIBALIZED	P

GRADE CODE: 1 - SLIGHT, 2 - MODERATE, 3 - MARKED, P - PRESENT

TABLE A110 (F1 - UNSCHEDULED DEATHS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP NECROPSY FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

GROUP 5: 900 MG/KG

	PUP NO.	SEX	LACT DAY	TISSUE	FINDING	GRADE
81918	1	M	1	BONE	FRACTURED PARIETAL, RIGHT	P
				STOMACH	MILK NOT PRESENT	P
				LUNGS	DID FLOAT	P
	7	M	1	LUNGS	DID FLOAT	P
				STOMACH	MILK NOT PRESENT	P
81951	1	M	0	GENERAL COMMENT	CANNIBALIZED	P
	2	F	0	LUNGS	DID NOT FLOAT	P
				GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	3	F	0	GENERAL COMMENT	CANNIBALIZED	P
	4	F	0	LUNGS	DID FLOAT	P
				GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	5	F	0	LUNGS	DID NOT FLOAT	P
				GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	6	F	0	GENERAL COMMENT	CANNIBALIZED	P
	7	F	0	LUNGS	DID NOT FLOAT	P
				GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
	8	U	0	GENERAL COMMENT	CANNIBALIZED	P
81955	6	M	1	STOMACH	MILK NOT PRESENT	P
				LUNGS	DID FLOAT	P
81964	1	M	0	STOMACH	MILK NOT PRESENT	P
				LUNGS	DID NOT FLOAT	P
	2	F	0	LUNGS	DID NOT FLOAT	P

GRADE CODE: 1 - SLIGHT, 2 - MODERATE, 3 - MARKED, P - PRESENT

TABLE A110 (F1 - UNSCHEDULED DEATHS)

PROJECT NO.:WIL-402011F ORAL RAT 28-DAY & DEVELOPMENTAL TOX SCREENING OF NAPHTHENIC ACID

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL PUP NECROPSY FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

PUP NO.	SEX	LACT DAY	TISSUE	GROUP 5: 900 MG/KG FINDING	GRADE
81964 (CONTINUED)					
2	F	0	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
3	F	0	LUNGS	DID NOT FLOAT	P
			STOMACH	MILK NOT PRESENT	P
4	M	2		NO REMARKABLE OBSERVATIONS	
5	M	2	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
6	M	2	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
7	M	2	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
8	M	1	STOMACH	MILK NOT PRESENT	P
			LUNGS	DID FLOAT	P
9	M	2	KIDNEY	RENAL PAPILLA(E) NOT FULLY DEVELOPED (WOO AND HOAR GRADE 1) BILATERAL	P
10	M	1	LUNGS	DID FLOAT	P
			GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
11	M	2		NO REMARKABLE OBSERVATIONS	
12	M	2	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
13	F	2	GENERAL COMMENT	TOO AUTOLYZED TO EXAMINE ABDOMINAL AND URINARY/REPRODUCTIVE	P
14	F	2		NO REMARKABLE OBSERVATIONS	
81968 1	M	0	LUNGS	DID NOT FLOAT	P
			STOMACH	MILK NOT PRESENT	P
2	F	0	LUNGS	DID NOT FLOAT	P
			STOMACH	MILK NOT PRESENT	P
3	M	1	LUNGS	DID FLOAT	P

GRADE CODE: 1 - SLIGHT, 2 - MODERATE, 3 - MARKED, P - PRESENT

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

PUP NO.	SEX	LACT DAY	TISSUE	GROUP 5: 900 MG/KG FINDING	GRADE
81968 (CONTINUED)					
3	M	1	STOMACH	MILK NOT PRESENT	P
4	M	1	LUNGS	DID FLOAT	P
			STOMACH	MILK NOT PRESENT	P
5	M	1	LUNGS	DID FLOAT	P
			STOMACH	MILK NOT PRESENT	P
9	M	1	LUNGS	DID FLOAT	P
			STOMACH	MILK NOT PRESENT	P
10	F	1	STOMACH	MILK NOT PRESENT	P
			LUNGS	DID FLOAT	P
11	F	1	STOMACH	MILK NOT PRESENT	P
			LUNGS	DID FLOAT	P
12	F	1	LUNGS	DID FLOAT	P
			STOMACH	MILK NOT PRESENT	P
81969 1	M	0	LUNGS	DID NOT FLOAT	P
			STOMACH	MILK NOT PRESENT	P
81973 1	M	1	LUNGS	DID FLOAT	P
			STOMACH	MILK NOT PRESENT	P
81980 1	M	1	STOMACH	MILK NOT PRESENT	P
			LUNGS	DID FLOAT	P
5	M	1	GENERAL COMMENT	CANNIBALIZED	P

GRADE CODE: 1 - SLIGHT, 2 - MODERATE, 3 - MARKED, P - PRESENT