

FINAL REPORT



Contents: Volume 1 of 2
Text, Summary Tables, and Appendices A - F

Study Title: A 14-Day Dose Range Finding Dermal Toxicity
Study Utilizing Petroleum Products, Diesel Oil
(Ultra Low Sulfur Diesel Fuel) in Sprague Dawley Rats

Study Number: WIL-402021

Study Director: [REDACTED]

Data Requirements: Not Applicable

Study Initiation Date: 2 December 2010

Study Completion Date: 18 January 2013

Performing Laboratory: WIL Research
1407 George Road
Ashland, OH 44805-8946

Sponsor Number: Not Applicable

Sponsor: American Petroleum Institute
1220 L Street, NW
Washington, DC 20005

WIL-402021 Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel)
American Petroleum Institute

COMPLIANCE STATEMENT

This non-GLP study, designated WIL-402021, was conducted in compliance with the WIL Research SOPs and the protocol as approved by the Sponsor. The data tables and the associated raw data were audited by the Quality Assurance Unit of WIL Research in accordance with the WIL Research SOPs and the protocol as approved by the Sponsor.



Senior Toxicologist, General Toxicology
Study Director

18 Jan 2013
Date

TABLE OF CONTENTS

VOLUME 1	<u>Page</u>
Compliance Statement.....	2
Table of Contents	3
Index of Tables	5
Index of Appendices.....	6
1. Summary.....	9
1.1. Objective	9
1.2. Study Design	9
1.3. Results.....	10
1.4. Conclusions	11
2. Introduction.....	12
2.1. General Study Information	12
2.2. Key Study Dates	13
2.3. WIL Research Key Study Personnel.....	13
3. Study Design	14
4. Experimental Procedures - Materials and Methods.....	16
4.1. Test Substance and Vehicle	16
4.1.1. Test Substance	16
4.1.2. Vehicle	16
4.1.3. Preparation	17
4.1.4. Sampling and Analyses.....	18
4.2. Test System, Animal Receipt, and Acclimation/Pretest Period.....	18
4.3. Animal Housing.....	19
4.4. Diet, Drinking Water, and Maintenance	19
4.5. Environmental Conditions	20
4.6. Assignment of Animals to Treatment Groups	20
4.7. Organization of Test Groups, Dosage Levels, and Treatment Regimen	21

VOLUME 1 (continued)	<u>Page</u>
5. Parameters Evaluated	25
5.1. Survival	25
5.2. Clinical Observations	25
5.3. Dermal Observations	25
5.4. Body Weights	25
5.5. Food Consumption	26
5.6. Anatomic Pathology	26
5.6.1. Macroscopic Examination	26
5.6.2. Organ Weights	28
5.7. Data Acquisition and Analysis	28
5.7.1. Acquisition and Reporting	28
5.7.2. Statistical Analysis	29
6. Results	30
6.1. Survival	30
6.2. Clinical Observations	30
6.3. Dermal Observations	31
6.4. Body Weights	32
6.5. Food Consumption	32
6.6. Anatomic Pathology	33
6.6.1. Macroscopic Examination	33
6.6.2. Organ Weights	33
7. Conclusions	34
8. Report Review and Approval	35
9. Quality Assurance Statement	36
10. References	37
11. Data Retention	38
12. Abbreviations	39

INDEX OF TABLES

VOLUME 1 (continued)	<u>Page</u>
S1. Summary of Survival and Disposition	41
S2. Summary of Clinical Findings (Detailed Physical Examinations/Dispositions)	43
S3. Summary of Post-Dose Findings (Dosing Day Observations)	46
S4. Summary of Dermal Observations	48
S5. Summary of Body Weights [g]	50
S6. Summary of Body Weight Changes [g]	52
S7. Summary of Cumulative Body Weight Changes [g]	54
S8. Summary of Food Consumption [g/animal/day]	56
S9. Summary of Macroscopic Findings (Unscheduled Deaths)	58
S10. Summary of Macroscopic Findings (Scheduled Necropsy)	60
S11. Summary of Organ Weights and Relative Organ Weights (Scheduled Necropsy)	62

INDEX OF APPENDICES

VOLUME 1 (continued)	<u>Page</u>
A. Study Protocol and Deviations	77
B. Pretest Clinical Observations	100
P1. Summary of Clinical Findings (Pretest Observations - Groups 1-6).....	101
P2. Summary of Clinical Findings (Pretest Observations - Groups 7-9).....	103
C. Animal Room Environmental Conditions.....	105
D. Groups 7-9 Data.....	113
R1. Summary of Survival and Disposition (Groups 7-9)	114
R2. Summary of Clinical Findings (Detailed Physical Examinations/Dispositions - Groups 7-9)	116
R3. Summary of Post-Dose Findings (Dosing Day Observations - Groups 7-9)	118
R4. Summary of Dermal Observations (Groups 7-9).....	120
R5. Summary of Body Weights [g] (Groups 7-9)	122
R6. Summary of Body Weight Changes [g] (Groups 7-9).....	124
R7. Summary of Cumulative Body Weight Changes [g] (Groups 7-9).....	126
R8. Summary of Food Consumption [g/animal/day] (Groups 7-9)	128
R9. Summary of Macroscopic Findings (Scheduled Necropsy - Groups 7-9).....	130
R10. Summary of Organ Weights and Organ Wts. Relative to Body Wts. (Scheduled Necropsy - Groups 7-9).....	132
R11. Individual Survival and Disposition (Groups 7-9).....	134
R12. Individual Clinical Observations (Detailed Physical Examinations/Dispositions - Groups 7-9)	136

VOLUME 1 (continued)	<u>Page</u>
R13. Individual Clinical Observations (At Time of Dosing - Groups 7-9).....	140
R14. Individual Clinical Observations (Dosing Day Observations - Groups 7-9)	146
R15. Individual Dermal Observations (Groups 7-9)	152
R16. Individual Body Weights [g] (Groups 7-9).....	158
R17. Individual Body Weight Changes [g] (Groups 7-9).....	164
R18. Individual Cumulative Body Weight Changes [g] (Groups 7-9).....	170
R19. Individual Food Consumption [g/animal/day] (Groups 7-9)	176
R20. Individual Macroscopic Findings (Scheduled Necropsy - Groups 7-9)	182
R21. Individual Organ Weights and Final Body Weights [g] (Scheduled Necropsy - Groups 7-9).....	194
R22. Individual Organ Wts. Relative to Final Body Wts. [g/100 g] (Scheduled Necropsy - Groups 7-9).....	200
E. Scoring Criteria for Dermal Reactions.....	206
F. Unscheduled Dermal Observations.....	208
U1. Individual Dermal Observations (Unscheduled Observations)	209
 VOLUME 2	
G. Individual Animal Data	211
A1. Individual Survival and Disposition.....	212
A2. Individual Clinical Observations (Detailed Physical Examinations/Dispositions).....	214
A3. Individual Clinical Observations (At Time of Dosing)	220
A4. Individual Clinical Observations (Dosing Day Observations)	230

VOLUME 2 (continued)	<u>Page</u>
A5. Individual Dermal Observations	240
A6. Individual Body Weights [g]	252
A7. Individual Body Weight Changes [g]	264
A8. Individual Cumulative Body Weight Changes [g]	276
A9. Individual Food Consumption [g/animal/day]	288
A10. Individual Macroscopic Findings (Unscheduled Deaths)	300
A11. Individual Macroscopic Findings (Scheduled Necropsy)	308
A12. Individual Organ Weights and Final Body Weights [g] (Scheduled Necropsy)	324
A13. Individual Organ Wts. Relative to Final Body Wts. [g/100 g] (Scheduled Necropsy)	340
A14. Individual Organ Weights Relative to Brain Weights [g/100 g] (Scheduled Necropsy)	356

1. SUMMARY

1.1. OBJECTIVE

The objective of this study was to evaluate the potential irritative and toxicity effects of repeated exposure of petroleum products, diesel oil (ultra low sulfur diesel fuel) over 14 days, and to assist in dose selection for subsequent dermal toxicity studies (OECD 414 and 411) in Sprague Dawley rats.

1.2. STUDY DESIGN

Petroleum products, diesel oil (ultra low sulfur diesel fuel) blend of 7 (CAS 68344-30-5) in the vehicle, mineral oil, was administered by once daily dermal application for 14 consecutive days to 4 groups (Groups 3-6) of CrI:CD(SD) rats. Dosage levels were 100, 300, 1000, and 1290 mg/kg/day for Groups 3, 4, 5 and 6, respectively. A concurrent vehicle control group (Group 2) received the vehicle on a comparable regimen. In order to aid in the selection of doses for subsequent studies to be conducted with this test substance, 3 additional dosage levels were evaluated. These dosage levels were 450, 600, and 750 mg/kg/day for Groups 7, 8, and 9, respectively. The dose volume was 1.5 mL/kg for Groups 2-9. A concurrent sham control group (Group 1) was subjected to the same procedures (*i.e.* shaving, collaring, sham dosing with glass rod, and sham removal of residual “substance”) as the test substance-treated groups; however, no vehicle or test substance was applied to these animals. Once weekly (on study days 6 and 13), the test site was gently patted in an effort to remove residual test substance. All animals were collared continuously during the 14-day dosing period. Each group (Groups 1-9) consisted of 2 animals/sex. Following 14 days of dose administration, all surviving rats were euthanized (study day 14).

All animals were observed twice daily for mortality and moribundity. Clinical examinations were performed at the time of dose administration and at approximately 1 to 2 hours following dose administration. Dermal observations were recorded daily, and detailed physical examinations were performed approximately weekly. Individual body weights and food consumption were recorded approximately weekly. Complete

necropsies were conducted on all animals. Selected organs were weighed for all surviving animals in Groups 1-6 and livers were weighed for the animals in Groups 7-9 at the scheduled necropsy (study day 14).

1.3. RESULTS

There were no test substance-related effects on food consumption or organ weights. Any clinical observations or macroscopic findings related to test substance administration were limited to the 1000 and 1290 mg/kg/day group animals, which were euthanized *in extremis*.

The 1000 and 1290 mg/kg/day group males and the 1290 mg/kg/day group females were euthanized *in extremis* on study day 6. The 1000 mg/kg/day group females were euthanized *in extremis* on study day 9. The moribundity of these animals was considered test substance-related; however, the physical conditions were attributed to the level of dermal irritation rather than to systemic toxicity. Clinical and dermal observations noted for the 1000 and 1290 mg/kg/day animals included vocalization during dosing and/or upon handling, very slight to moderate erythema, very slight to moderate edema, desquamation, exfoliation, and/or encrustation. At necropsy, these animals were observed with scabbing and/or thickening of the treated skin. Evaluation of test substance-related effects on body weights and food consumption in the 1000 and 1290 mg/kg/day groups was precluded by the euthanasia *in extremis* of all animals in these groups. All other animals survived to the scheduled necropsy.

Dermal observations of very slight to moderate erythema were noted for males in the 100, 300, 600, and 750 mg/kg/day groups and for females in the 600 and 750 mg/kg/day groups. Erythema generally increased in severity and persisted for a longer duration with increasing dose, and in the 750 mg/kg/day group, was accompanied by very slight to slight edema. Desquamation was noted for males in the 100, 600, and 750 mg/kg/day groups and for females in the 750 mg/kg/day group. These findings were considered related to test substance administration.

Test substance-related lower body weights were noted in the 100, 300, 450, 600, and 750 mg/kg/day group males and the 600 and 750 mg/kg/day group females during the first week of dose administration.

1.4. CONCLUSIONS

Based on the results of this study, dermal administration of petroleum products, diesel oil (ultra low sulfur diesel fuel), over an area of approximately 10% of the shaved body surface area to Crl:CD(SD) rats for 14 consecutive days at dosage levels of 100, 300, 450, 600, 750, 1000, and 1290 mg/kg/day resulted in test substance-related moribundity in all animals from the 1000 and 1290 mg/kg/day groups. Moribundity was attributed to the level of dermal irritation, rather than to systemic toxicity. Test substance-related dermal observations included very slight to moderate erythema in the 100, 300, 600, and 750 mg/kg/day groups and very slight to slight edema in the 750 mg/kg/day group. In addition, nonadverse body weight effects were noted in the 100, 300, 450, 600, and 750 mg/kg/day group males and the 600 and 750 mg/kg/day group females. Therefore, the maximum tolerated dose (MTD) was considered to be 750 mg/kg/day.

2. INTRODUCTION

The objective of this study was to evaluate the potential irritative and toxicity effects of repeated exposure of petroleum products, diesel oil (ultra low sulfur diesel fuel) over 14 days, and to assist in dose selection for subsequent dermal toxicity studies (OECD 414 and 411) in Sprague Dawley rats.

2.1. GENERAL STUDY INFORMATION

This report presents the data from “A 14-Day Dose Range Finding Dermal Toxicity Study Utilizing Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel) in Sprague Dawley Rats.” Due to software spacing constraints, the study title appears as “14-Day Rat Dermal Study of Petroleum Products, Diesel Oil” on the report tables. 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 12. \(Abbreviations\)](#).

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

<u>Computer Protocol</u>	<u>Type of Data Collected</u>
WIL-402021	Main study data (Groups 1-6)
WIL-402021R.....	Main study data (Groups 7-9)
WIL-402021P	Pretest data (Groups 1-6)
WIL-402021W	Pretest data (Groups 7-9)
WIL-402021U	Unscheduled dermal observations

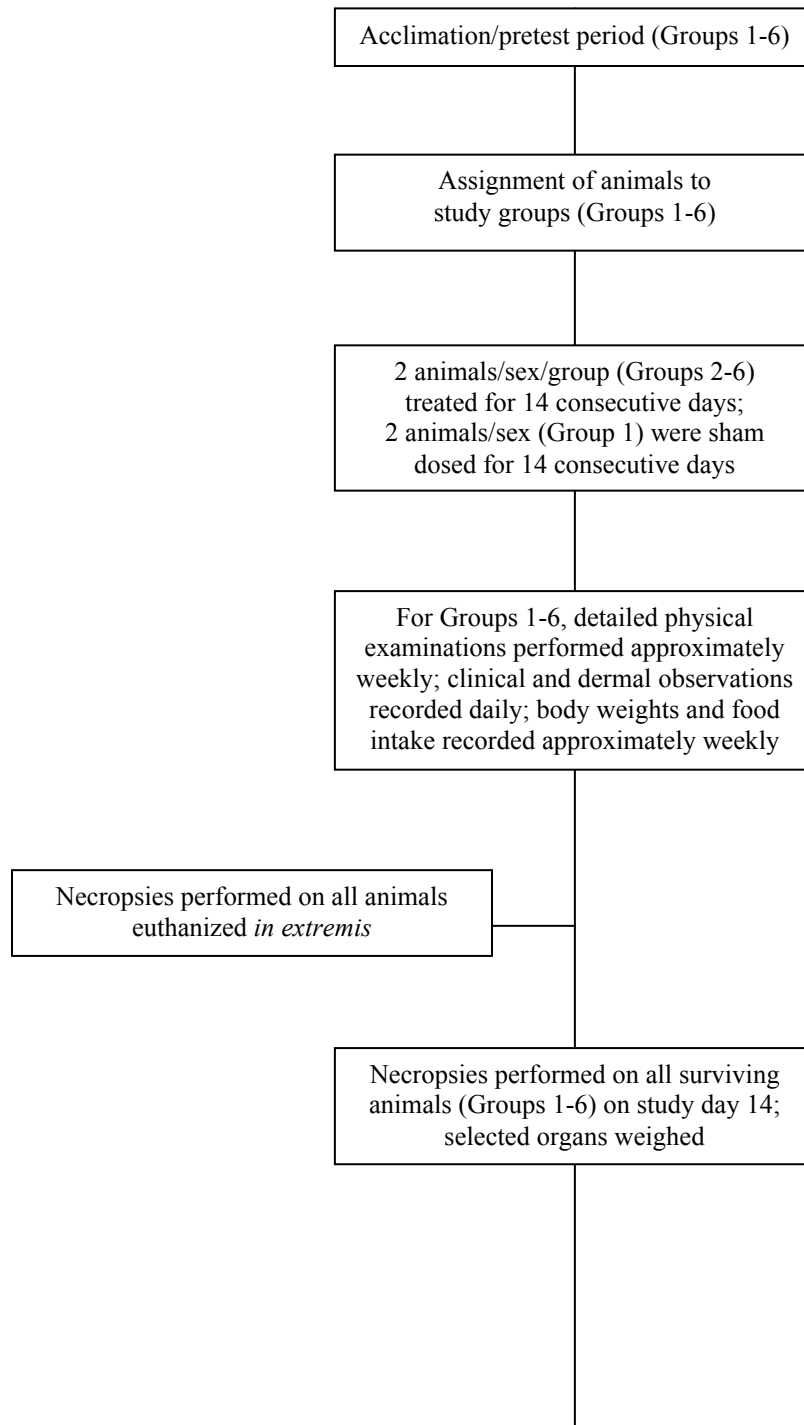
2.2. KEY STUDY DATES

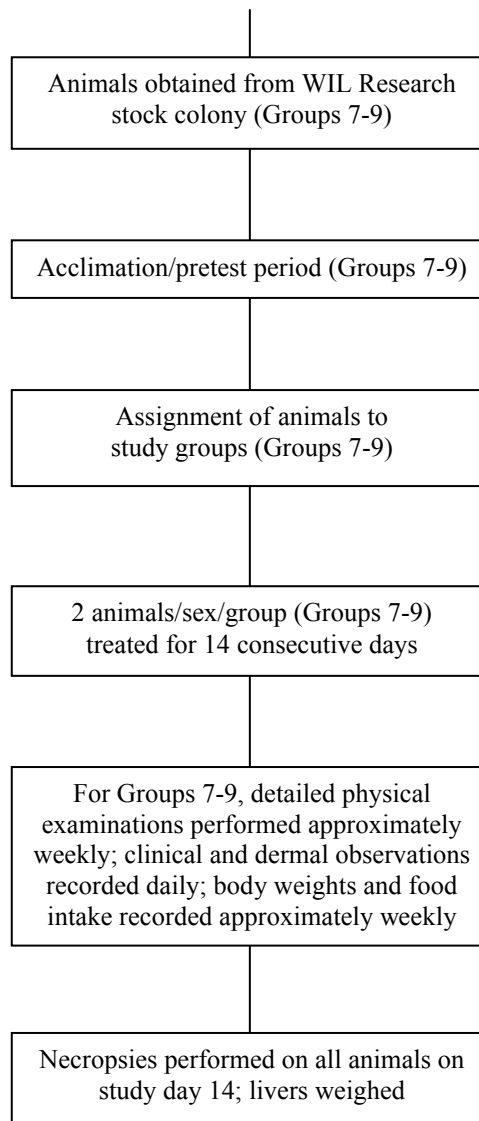
<u>Date(s)</u>	<u>Event(s)</u>
23 November 2010	Animal receipt (Groups 1-6)
2 December 2010.....	Assignment to study groups (Groups 1-6)
3 December 2010.....	Initiation of dose administration (study day 0; Groups 1-6)
17 December 2010.....	Scheduled necropsy (study day 14; Groups 1-6))
18 February 2011	Animal obtained from WIL Research stock colony (Groups 7-9)
23 February 2011	Assignment to study groups (Groups 7-9)
24 February 2011	Initiation of dose administration (study day 0; Groups 7-9)
10 March 2011	Scheduled necropsy (study day 14; Groups 7-9)

2.3. WIL RESEARCH KEY STUDY PERSONNEL

	Operations Manager, Pathology Manager, Quality Assurance
	Senior Operations Manager, Vivarium Manager, Gross Pathology and Developmental Toxicology Laboratory
	Operations Manager, Toxicology Clinical Veterinarian Vice President, Pathology
	Group Manager, Formulations Laboratory Director, Nonclinical Safety Operations Operations Manager, Reporting & Technical Support Services

3. STUDY DESIGN





4. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

4.1. TEST SUBSTANCE AND VEHICLE

4.1.1. TEST SUBSTANCE

The test substance, petroleum products, diesel oil (ultra low sulfur diesel fuel) blend of 7, was received from EPL Archives, Inc., Sterling, VA, on behalf of American Petroleum Institute, on 10 November 2010, as follows:

Identification	Physical Description
Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel) Blend of 7 (CAS no. 68344-30-5) [WIL log no. 8472A]	Clear, yellow liquid

Documentation regarding the purity and stability of the test substance is on file with the Sponsor and WIL Research. The purity of the test substance was 100%. The test substance was stored at room temperature, protected from light, and was considered stable under these conditions. A reserve sample of the test substance was collected and stored in the WIL Research Archives.

4.1.2. VEHICLE

The vehicle used in preparation of the test substance formulations for Groups 3-6 and for administration to the vehicle control group (Group 2) was mineral oil (lot nos. YV0056 and YX0253; exp. dates: 5 February 2011 and 19 March 2011, respectively; manufactured by Spectrum Chemical Manufacturing Corporation, New Brunswick, NJ). The vehicle used in preparation of the test substance formulations for Groups 7-9 was mineral oil (lot nos. ZH1000 and 9BFO641; exp. dates: 3 March 2012 and 1 January 2014, respectively; manufactured by Spectrum Chemical Manufacturing Corporation, New Brunswick, NJ, and purchased from CVS Pharmacy, respectively).

4.1.3. PREPARATION

For the vehicle control group (Group 2), a sufficient amount of mineral oil was dispensed into a clear scintillation vial daily.

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 (mg/mL)
1	Sham Control	NA	NA
2	Vehicle	0	0
3	Test Substance ^a	100	66.6
4	Test Substance ^a	300	200
5	Test Substance ^a	1000	666.6
6	Test Substance ^{a, b}	1290	Neat
7	Test Substance ^a	450	300
8	Test Substance ^a	600	400
9	Test Substance ^a	750	500

NA = Not Applicable

^a = The test substance used for Groups 3-9 was petroleum products, diesel oil (ultra low sulfur diesel fuel).

^b = The specific gravity = 0.86 g/mL.

The test substance formulations were weight/volume (test substance/vehicle) mixtures with the exception of Group 6, which was administered as neat test substance. The test substance formulations were prepared daily as single formulations for each dosage level and stored at room temperature, protected from light, prior to dose application. The test substance formulations were stirred continuously throughout the preparation and dose administration procedures.

4.1.4. SAMPLING AND ANALYSES

Assessments of formulation homogeneity, stability, and concentration were not included as a part of this non-GLP study.

4.2. TEST SYSTEM, ANIMAL RECEIPT, AND ACCLIMATION/PRETEST PERIOD

Crl:CD(SD) rats were used as the test system for this study. This species and strain of animal is recognized as appropriate for short-term toxicity studies. The Sprague Dawley rat was selected because it is a widely used strain for which significant historical control data are available. The number of animals selected for this study (see [Section 4.7.](#)) was the minimum needed to yield scientifically meaningful data.

For Groups 1-6, Crl:CD(SD) rats (15 males and 15 females) were received in good health from Charles River Laboratories, Inc., Raleigh, NC on 23 November 2010. The animals were approximately 48 days old at receipt. Each animal was examined by a qualified technician on the day of receipt and weighed 3 days later. Each animal was uniquely identified by a Monel[®] metal ear tag displaying the permanent identification number. All animals were housed for a 7-day acclimation/pretest period. During this period, each animal was observed twice daily for mortality and changes in general appearance or behavior.

For Groups 7-9, 6 male and 6 female Crl:CD(SD) rats in apparent good health were obtained from the WIL Research stock colony on 18 February 2011. All animals were originally obtained from Charles River Laboratories, Inc., Raleigh, NC. Each animal was uniquely identified with a subcutaneous microchip (BMDS system) implanted in the dorsoscapular area. All animals were housed for a 6-day acclimation/pretest period. During this period, each animal was observed twice daily for mortality and changes in general appearance or behavior.

Pretest data collection began on 26 November 2010 and 18 February 2011 for Groups 1-6 and Groups 7-9, respectively. Individual body weights and food consumption were

recorded and detailed physical examinations were performed periodically during the pretest period. Pretest clinical observations are presented in [Appendix B](#).

Animals were acclimated to wearing Elizabethan collars on an incremental basis, starting with approximately 1 hour and ending with approximately 24 hours of acclimation, for approximately 1 week prior to the initiation of dose application as outlined below:

Groups 1-6	
Study Day	Approximate Acclimation Period (Hours)
-6	1
-5	2
-4	4
-3	8
-2	24
Groups 7-9	
-5	1
-4	2
-3	4
-2	8
-1	24

4.3. ANIMAL HOUSING

Upon arrival, all animals were housed individually in clean, stainless steel, wire-mesh cages suspended above cage-board. 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. Enrichment devices were provided to all animals as appropriate throughout the study for environmental enrichment and to aid in maintaining the animals' oral health, and were sanitized weekly.

4.4. DIET, DRINKING WATER, AND MAINTENANCE

The basal diet used in this study, PMI Nutrition International, LLC, Certified Rodent (pellet) LabDiet[®] 5002, is a certified feed with appropriate analyses performed by the manufacturer and provided to WIL Research. Reverse osmosis-treated (on-site) drinking

water, delivered by an automatic watering system, and the basal diet were provided *ad libitum* throughout the study. Municipal water supplying the facility was analyzed for contaminants according to SOPs. The results of the diet and water analyses are maintained at WIL Research. No contaminants were present in animal feed or water at concentrations sufficient to interfere with the objectives of this study.

4.5. ENVIRONMENTAL CONDITIONS

All animals 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 $71 \pm 5^{\circ}\text{F}$ ($22 \pm 3^{\circ}\text{C}$) and $50 \pm 20\%$, respectively. 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 C](#). For Groups 1-6, actual mean daily temperature ranged from 69.0°F to 69.7°F (20.6°C to 20.9°C) and mean daily relative humidity ranged from 45.8% to 51.6% during the study. For Groups 7-9, actual mean daily temperature ranged from 70.2°F to 70.5°F (21.2°C to 21.4°C) and mean daily relative humidity ranged from 36.7% to 48.6% 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

On 2 December 2010 (the day prior to the initiation of dose administration for Groups 1-6), all available rats were weighed and examined in detail for physical abnormalities. These data were collected using WTDMS™ and reviewed by the Study Director. The animals judged suitable for assignment to the study (Groups 1-6) were selected for use in a computerized randomization procedure based on body weight stratification in a block design. A printout containing the animal numbers and individual group assignments was generated, and the animals were then arranged into groups (Groups 1-6) according to the printout. Individual body weights at randomization were

within $\pm 20\%$ of the mean for each sex. Animals not assigned to study were euthanized by carbon dioxide inhalation and discarded.

On 23 February 2011 (the day prior to initiation of dose administration for Groups 7-9), the 6 male and 6 female rats transferred from the WIL Research stock colony were weighed and examined in detail for physical abnormalities. These data were collected using WTDMS™ and reviewed by the Study Director. The animals were used in a computerized randomization procedure based on body weight stratification in a block design. A printout containing the animal numbers and individual group assignments was generated, and the animals were then arranged into groups (Groups 7-9) according to the printout. Individual body weights at randomization were within $\pm 20\%$ of the mean for each sex.

Each group (Groups 1-9) consisted of 2 males and 2 females. For Groups 1-6, the animals were approximately 8 weeks old at the initiation of dose administration, and for Groups 7-9, the animals were approximately 12 to 17 weeks old at the initiation of dose administration. At randomization, individual body weights ranged from 236 g to 273 g for males and from 172 g to 209 g for females in Groups 1-6, and from 377 g to 480 g for males and from 233 g to 349 g for females in Groups 7-9. Data for animals assigned to Groups 7-9 are presented in [Appendix D](#).

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

Prior to the initiation of dose administration, and throughout the study as necessary, the hair was clipped from the back (down each side to the ventral surface) and flanks of each animal using an electric clipper; a different set of clippers was used for the sham control group, the vehicle control group, and the test substance-treated groups to avoid potential cross-contamination.

The vehicle or test substance was applied evenly to the clipped, unabraded area of skin and spread evenly using a glass rod (to ensure contact with an area of approximately

10% of the body surface area) once daily for 14 consecutive days. No vehicle was applied to the sham control group. All animals (Groups 1-9) were fitted with Elizabethan collars during the dosing period. On study days 6 and 13, the dose site of each animal was gently patted using a disposable paper towel according to WIL SOPs. If needed, the dose site was gently patted with gauze moistened with the vehicle (lot no. 100635; exp. date: 24 February 2012; manufactured by Fisher Chemical, Fairlawn, NJ) and then, again, with dry gauze or a disposable paper towel.

The corners of the application site were marked daily with indelible ink to allow proper identification of the treated and untreated skin. The area of test substance application was measured and recorded weekly for all animals in each group. The actual surface area of coverage was calculated for each representative as follows:

$$\text{Total body surface area (cm}^2\text{)} = K \cdot \text{body weight (grams)}^{(2/3)}$$

Where:

K = 9 for rats ([Freireich *et al.*, 1966](#))

The mean area of coverage was approximately 10% for males and females.

The following tables present the approximate percentages of body surface area sham covered or covered by the vehicle control or test substance for each group/week/sex.

Mean Percent Coverage (%) - Males									
Group	1	2	3	4	5	6	7	8	9
Dosage Level (mg/kg/day)	0	0	100	300	1000	1290	450	600	750
Study Week 0 ^a	10.2	10.0	10.1	10.2	10.3	10.3	10.9	10.6	10.5
Study Week 1 ^a	10.5	10.1	10.3	10.6	NA	NA	10.9	10.1	10.4
Mean Coverage ^b	10.3	10.0	10.2	10.4	10.3*	10.3*	10.9	10.3	10.5
Standard Deviation	0.4	0.0	0.3	0.5	0.4	0.6	1.0	0.4	0.5

^a = Data presented for each study week represents the group mean (N = 2)

^b = Data presented represents the mean for the combined study weeks (N = 4), except where * presented (N = 2)

NA = Not applicable; animals were euthanized *in extremis* prior to data collection during study week 1

Group Dosage Level (mg/kg/day)	Mean Percent Coverage (%) - Females								
	1	2	3	4	5	6	7	8	9
	0	0	100	300	1000	1290	400	600	750
Study Week 0 ^a	10.3	10.4	10.5	10.4	10.5	10.3	10.4	9.7	11.1
Study Week 1 ^a	10.5	9.8	10.4	10.2	10.7	NA	10.4	10.6	11.0
Mean Coverage^b	10.4	10.1	10.4	10.3	10.6	10.3*	10.4	10.1	11.1
Standard Deviation	0.3	0.4	0.5	0.3	0.7	0.3	0.4	0.8	1.3

^a = Data presented for each study week represents the group mean (N = 2)

^b = Data presented represents the mean for the combined study weeks (N = 4), except where * presented (N = 2)

NA = Not applicable; animals were euthanized *in extremis* prior to data collection during study week 1

The dose volume for all groups was 1.5 mL/kg, adjusted as mL/kg per the most recent body weight. Adjusted doses became effective the day of collection of the weekly body weights. The first day of dosing was study day 0.

The following table presents the study group assignment:

Group Number	Treatment	Dosage Level (mg/kg/day)	Dose Volume (mL/kg)	Number of Animals	
				Males	Females
1	Sham Control	NA	NA	2	2
2	Vehicle	0	1.5	2	2
3	Test Substance ^a	100	1.5	2	2
4	Test Substance ^a	300	1.5	2	2
5	Test Substance ^a	1000	1.5	2	2
6	Test Substance ^a	1290	1.5	2	2
7	Test Substance ^a	450	1.5	2	2
8	Test Substance ^a	600	1.5	2	2
9	Test Substance ^a	750	1.5	2	2

NA = Not Applicable

^a = The test substance used for Groups 3-9 was petroleum products, diesel oil (ultra low sulfur diesel fuel).

Dosage levels were selected by the Sponsor.

The selected route of administration for this study was dermal to determine the potential toxicity of the test substance when administered by the dermal route.

5. PARAMETERS EVALUATED

5.1. SURVIVAL

All animals were observed twice daily, once in the morning and once in the afternoon, for mortality and moribundity. Moribund animals were euthanized by carbon dioxide inhalation and necropsies were performed.

5.2. CLINICAL OBSERVATIONS

Clinical examinations were performed twice daily, at the time of dose administration and approximately 1 to 2 hours following dose administration. The absence or presence of findings was recorded for individual animals at the scheduled intervals. Detailed physical examinations were conducted on all animals at least once during the pretreatment period, approximately weekly during the study, and prior to the unscheduled or scheduled necropsies.

5.3. DERMAL OBSERVATIONS

The application sites were scored daily (following test substance removal) from study days 0 through 14 for erythema and edema in accordance with the methods of Draize ([Draize, 1965](#)) using the 4-step grading system presented in [Appendix E](#). All dermal findings were recorded. A separate computer protocol was used to record any dermal observations noted outside of the above-specified intervals. These unscheduled dermal observations are presented in [Appendix F](#).

5.4. BODY WEIGHTS

Individual body weights were recorded approximately weekly, beginning during the pretest period, for the duration of the study. Body weights were collected with collars on study days 7 and 14 using the following procedure to account for the collar weight in the body weights. A collar of like size to the ones being used on the animals was placed on the scale, and the scale was tared to zero. The collar was then removed from the scale, and each animal was placed on the scale and weighed. Mean body weights and mean

body weight changes were calculated for the corresponding intervals. Final body weights (fasted) were recorded on the day of the scheduled necropsy.

5.5. FOOD CONSUMPTION

Individual food consumption was recorded approximately weekly during the pretest period and throughout the study. Food intake was calculated as g/animal/day for the corresponding body weight intervals. When food consumption could not be measured for a given interval (due to spillage, weighing error, obvious erroneous value, *etc.*), the appropriate interval was footnoted as "NA" on the individual tables.

5.6. ANATOMIC PATHOLOGY

5.6.1. MACROSCOPIC EXAMINATION

A complete necropsy was conducted on all animals. Animals were euthanized by carbon dioxide inhalation followed by exsanguination. The necropsies included, but were not limited to, examination of the external surface, all orifices, and the cranial, thoracic, abdominal, and pelvic cavities, including viscera. Clinical findings that were confirmed macroscopically were designated CEO on the individual macroscopic data tables. For Groups 1-6, the following tissues and organs were collected and placed in 10% neutral-buffered formalin (except as noted):

Adrenals (2)	Lungs (including bronchi, fixed by inflation with fixative)
Aorta	Lymph nodes
Bone with marrow	Axillary
Femur with joint	Mesenteric (2)
Sternum	Ovaries with oviducts (2)
Bone marrow smear	Pancreas
(from femur) ^a	Peripheral nerve (sciatic)
Brain	Pituitary
Cerebrum level 1	Prostate
Cerebrum level 2	Salivary glands (mandibular [2])
Cerebellum with medulla/pons	Seminal vesicles (2)
Cervix	Skeletal muscle (rectus femoris)
Epididymides (2) ^b	Skin (with mammary gland) ^d
Eyes with optic nerve (2) ^c	Skin (treated, sham, untreated [posterior to treated skin])
Gastrointestinal tract	Spinal cord (cervical, thoracic, lumbar)
Esophagus	Spleen
Stomach	Testes (2) ^b
Duodenum	Thymus
Jejunum	Thyroid (with parathyroids, if present [2])
Ileum	Trachea
Cecum	Urinary bladder
Colon	Uterus
Rectum	Vagina
Heart	Gross lesions (when possible)
Kidneys (2)	
Lacrimal gland (exorbital [2])	
Liver (sections of 2 lobes)	

^a = Bone marrow smears were obtained at scheduled necropsy and from animals euthanized *in extremis*, but not placed in formalin; slides were not examined.

^b = Fixed in Bouin's solution.

^c = Fixed in Davidson's solution.

^d = Collected from females; a corresponding section of skin was collected from the same anatomical location in males.

5.6.2. ORGAN WEIGHTS

The following organs were weighed from all animals in Groups 1-6 at the scheduled necropsy:

Adrenals	Pituitary
Brain	Prostate
Epididymides	Spleen
Heart	Testes
Kidneys	Thymus
Liver	Thyroid with parathyroids*
Ovaries with oviducts	Uterus

Paired organs were weighed together. Designated organs (*) were weighed after fixation. For animals in Groups 7-9, the liver was weighed and discarded. Organ to final body weight and organ to brain weight ratios were calculated where applicable.

5.7. DATA ACQUISITION AND ANALYSIS

5.7.1. ACQUISITION AND REPORTING

Program/System	Description
Archive Management System (AMS)	In-house developed application for storage, maintenance, and retrieval of information for archived materials (<i>e.g.</i> , lab books, study data, wet tissues, slides, <i>etc.</i>).
Bio Medic Data Systems (BMDS) Implantable Programmable Temperature Transponders™ (IPTT-300)	Animal identification.
Formulations Dose Dispensing Management System (FDDMS)	In-house developed system used to assign unique barcodes to formulation containers and individual containers used for dispensing dosing formulations.
InSight® Publisher	Electronic publishing system (output is Adobe Acrobat, PDF).
Master Schedule	Maintains the master schedule for the company.

Program/System	Description
Metasys DDC Electronic Environmental Control System	Controls and monitors animal room environmental conditions.
Microsoft® Office 2002 and 2007	Used in conjunction with the publishing software to generate study reports.
WIL Metasys	In-house developed system used to record and report animal room environmental conditions.
Provantis Dispense™	Comprehensive system (Instem LSS Limited) to manage test materials, including receipt, formulation instructions, and accountability.
WIL Toxicology Data Management System™ (WTDMS™)	In-house developed system used for collection and reporting of in-life and <i>postmortem</i> 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.	

5.7.2. STATISTICAL ANALYSIS

Statistical analysis of the in-life data was not conducted due to the small group size.

6. RESULTS

6.1. SURVIVAL

Summary Data: [Table S1](#), [Table R1](#)

Individual Data: [Table A1](#), [Table R11](#)

The 1000 mg/kg/day group males and 1290 mg/kg/day group males and females were euthanized *in extremis* on study day 6 and the 1000 mg/kg/day group females were euthanized *in extremis* on study day 9 due to the severity of localized test substance effects. Clinical observations of vocalization during dosing was noted for 1000 mg/kg/day group male no. 90226, 1290 mg/kg/day group male no. 90213, and 1290 mg/kg/day group female no. 90232 on study day 5. A single 1000 mg/kg/day group female (no. 90230) was noted with vocalization during dosing on study days 5, 6, and 9. In addition, female no. 90232 was noted with vocalization upon handling on study day 6. Dermal observations of very slight to moderate erythema, very slight to moderate edema, and desquamation were noted for the 1000 and/or 1290 mg/kg/day group males and females beginning on study day 4 and continuing to the respective day of unscheduled euthanasia (study day 6 or 9) for all animals euthanized *in extremis*. In addition, exfoliation was noted for a single 1000 mg/kg/day group male on study days 4 and 5 and encrustation was noted for a single 1290 mg/kg/day group female on study day 9. These observations in the animals euthanized *in extremis* (1000 and 1290 mg/kg/day) were considered test substance-related. All other animals survived to the scheduled necropsy.

6.2. CLINICAL OBSERVATIONS

Summary Data: [Table S2](#), [Table S3](#), [Table R2](#), [Table R3](#)

Individual Data: [Table A2](#), [Table A3](#), [Table A4](#), [Table R12](#), [Table R13](#), [Table R14](#)

There were no test substance-related clinical observations in the 100, 300, 450, 600, and 750 mg/kg/day groups. All other clinical findings in the test substance-treated groups were noted with similar incidence in the control group, were limited to single animals,

were not noted in a dose-related manner, and/or were common findings for laboratory rats of this age and strain.

6.3. DERMAL OBSERVATIONS

Summary Data: [Table S4](#), [Table R4](#)

Individual Data: [Table A5](#), [Table R15](#); [Appendix F](#)

Test substance-related dermal observations noted for the animals that survived to the scheduled necropsy included very slight to moderate erythema, very slight to slight edema, and desquamation.

Test substance-related dermal observations of very slight to moderate erythema and desquamation were noted in the 600 and 750 mg/kg/day groups, with erythema increasing in severity with the increase in dosage level. In addition, males and females in the 750 mg/kg/day group had test substance-related occurrences of very slight to slight edema. These dermal findings in the 600 and 750 mg/kg/day groups were noted as early as study day 4 and as late as study day 14.

Test substance-related dermal observations of very slight to slight erythema were noted for males in the 100 and 300 mg/kg/day groups beginning on study day 4 and continuing to study day 6 and 10, respectively, with erythema increasing in severity with the increase in dosage level. In addition, desquamation was noted for 1 male in the 100 mg/kg/day group during study days 9 to 14, inclusively.

There were no test substance-related dermal observations in the 100 and 300 mg/kg/day group females or in the 450 mg/kg/day group males and females.

6.4. BODY WEIGHTS

Summary Data: [Table S5](#), [Table S6](#), [Table S7](#), [Table R5](#), [Table R6](#), [Table R7](#)

Individual Data: [Table A6](#), [Table A7](#), [Table A8](#), [Table R16](#), [Table R17](#), [Table R18](#)

Test substance-related, nonadverse lower mean body weights were noted in the 100, 300, 450, 600, and 750 mg/kg/day group males and the 600 and 750 mg/kg/day group females. Mean body weight losses or lower mean body weight gains were noted for these animals during study days 0 to 7. As a result, mean cumulative body weight losses (study days 0 to 13) were noted in the 450, 600, and 750 mg/kg/day group males and the 600 and 750 mg/kg/day group females.

Evaluation of test substance-related effects on body weights at 1000 and 1290 mg/kg/day was precluded by the euthanasia *in extremis* of all males and females in these groups by study day 6 or 9.

6.5. FOOD CONSUMPTION

Summary Data: [Table S8](#), [Table R8](#)

Individual Data: [Table A9](#), [Table R19](#)

Food consumption was unaffected by test substance administration.

Evaluation of test substance-related effects on food consumption at 1000 and 1290 mg/kg/day was precluded by the euthanasia *in extremis* of all males and females in these groups by study day 6 or 9.

6.6. ANATOMIC PATHOLOGY

6.6.1. MACROSCOPIC EXAMINATION

Summary Data: [Table S9](#), [Table S10](#), [Table R9](#)

Individual Data: [Table A10](#), [Table A11](#), [Table R20](#)

Test substance-related macroscopic findings were limited to those noted for the 1000 and 1290 mg/kg/day group animals euthanized *in extremis* and included scabbing and/or thickening of the treated skin.

There were no other test substance-related macroscopic findings at the unscheduled and scheduled necropsies. All other macroscopic findings noted were considered to be spontaneous and/or incidental in nature and unrelated to test substance administration.

6.6.2. ORGAN WEIGHTS

Summary Data: [Table S11](#), [Table R10](#)

Individual Data: [Table A12](#), [Table A13](#), [Table A14](#), [Table R21](#), [Table R22](#)

Organ weights were unaffected by test substance administration.

7. CONCLUSIONS

Based on the results of this study, dermal administration of petroleum products, diesel oil (ultra low sulfur diesel fuel), over an area of approximately 10% of the shaved body surface area to Crl:CD(SD) rats for 14 consecutive days at dosage levels of 100, 300, 450, 600, 750, 1000, and 1290 mg/kg/day resulted in test substance-related moribundity in all animals from the 1000 and 1290 mg/kg/day groups. Moribundity was attributed to the level of dermal irritation, rather than to systemic toxicity. Test substance-related dermal observations included very slight to moderate erythema in the 100, 300, 600, and 750 mg/kg/day groups and very slight to slight edema in the 750 mg/kg/day group. In addition, nonadverse lower body weights were noted in the 100, 300, 450, 600, and 750 mg/kg/day group males and the 600 and 750 mg/kg/day group females. Therefore, the maximum tolerated dose (MTD) was considered to be 750 mg/kg/day.

8. REPORT REVIEW AND APPROVAL

Report Approved By:

[Redacted Signature]

Senior Toxicologist, General Toxicology
Study Director

18 Jan 2013
Date

Report Prepared By:

[Redacted Signature]
Associate Study Analyst

[Redacted Signature]
Study Analyst

18 Jan 2013
Date

Report Reviewed By:

[Redacted Signature]
Project Specialist, General Toxicology

18 Jan 2013
Date

[Redacted Signature]
Group Manager, Reporting &
Technical Support Services

18 Jan 2013
Date

[Redacted Signature]
Assistant Director, General Toxicology

18 Jan 2013
Date

9. QUALITY ASSURANCE STATEMENT

<u>Date(s) of Inspection(s)</u>	<u>Phase Inspected</u>	<u>Date(s) Findings Reported to Study Director</u>	<u>Date(s) Findings Reported to Management</u>
29-Dec-2010	Study Records (I-1 Data for Tables Only)	29-Dec-2010	26-Jan-2011
29-Dec-2010	Study Records (N-1 Data for Tables Only)	29-Dec-2010	26-Jan-2011
04-Jan-2011	Draft Summary and Individual Data Tables	04-Jan-2011	28-Feb-2011
28-Mar-2011	Study Records (I-2 Data for Tables Only)	28-Mar-2011	25-Apr-2011
28-Mar-2011	Study Records (N-2 Data for Tables Only)	28-Mar-2011	25-Apr-2011
31-Mar-2011	Draft Report Tables (Summary and Individual for Groups 7-9)	31-Mar-2011	25-Apr-2011
17-Jan-2013	Final Report (Summary and Individual Data Tables)	17-Jan-2013	17-Jan-2013

This study and the corresponding report were not audited by the WIL Quality Assurance Unit with the following exception. The data tables and the associated raw data were audited by the Quality Assurance Unit of WIL Research in accordance with the WIL Research SOPs and the protocol as approved by the Sponsor. Quality Assurance findings, derived from the inspections of the raw data and draft data tables, are documented and have been reported to the Study Director.

Quality Assurance Representative

18 Jan 2013
Date

10. REFERENCES

Draize, J.H. The appraisal of the safety of chemicals in foods, drugs, and cosmetics. *Dermal Toxicity* **1965**, 46-59.

Freireich, E.J.; Gehan, E.A.; Rall, D.P.; Schmidt, L.H.; Skipper, H.E. Quantitative Comparison Toxicity of Anticancer Agents in Mouse, Rat, Hamster, Dog, Monkey, and Man. *Cancer Chemotherapy Reports* **1966**, 50(4), 219-244.

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**.

11. DATA RETENTION

The Sponsor has title to all documentation records, raw data, specimens, or other work product generated during the performance of the study. Any remaining work product generated by WIL Research, including raw paper data and specimens, are retained in the WIL Research Archives as specified in the study protocol.

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

12. **ABBREVIATIONS**

The following abbreviations may apply to this report:

AAALAC	-	Association for Assessment and Accreditation of Laboratory Animal Care
cm	-	centimeter
CEO	-	correlates with externally observed
EPA	-	Environmental Protection Agency
<i>etc.</i>	-	<i>et cetera</i>
g	-	gram
GLP	-	Good Laboratory Practices
kg	-	kilogram
mg	-	milligram
mL	-	milliliter
MTD	-	maximum tolerated dose
NA	-	not applicable
OECD	-	Organisation for Economic Cooperation and Development
SOP	-	standard operating procedure
WTDMS™	-	WIL Toxicology Data Management System

TABLES S1 - S11

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S1
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF SURVIVAL AND DISPOSITION

PAGE 1

MALES																			
GROUP : 1					2					3					4				
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE		LIVE	FD	EE	SE		LIVE	FD	EE	SE	
0	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
1	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
2	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
3	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
4	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
5	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
6	2	0	0	0	2	0	0	0		2	0	0	0		0	0	2	0	
7	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
8	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
9	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
10	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
11	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
12	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
13	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
14	0	0	0	2	0	0	0	2		0	0	0	2		0	0	0	0	
DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA																			
1-	UNTREATED				2-	0 MG/KG/DAY				3-	100 MG/KG/DAY				4-	300 MG/KG/DAY			
																5- 1000 MG/KG/DAY			
																6- 1290 MG/KG/DAY			

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S1
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF SURVIVAL AND DISPOSITION

PAGE 2

FEMALES																			
GROUP : 1					2					3					4				
5					6														
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE		LIVE	FD	EE	SE		LIVE	FD	EE	SE	
0	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
1	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
2	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
3	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
4	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
5	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
6	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
7	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
8	2	0	0	0	2	0	0	0		2	0	0	0		2	0	0	0	
9	2	0	0	0	2	0	0	0		2	0	0	0		0	0	2	0	
10	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
11	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
12	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
13	2	0	0	0	2	0	0	0		2	0	0	0		0	0	0	0	
14	0	0	0	2	0	0	0	2		0	0	0	2		0	0	0	0	
DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA																			
1-	UNTREATED				2-	0 MG/KG/DAY				3-	100 MG/KG/DAY				4-	300 MG/KG/DAY			
																5- 1000 MG/KG/DAY			
																6- 1290 MG/KG/DAY			

PSURVv4.10
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 1

----- M A L E -----						
TABLE RANGE: GROUP:	1	2	3	4	5	6

NORMAL						
-NO SIGNIFICANT CLINICAL OBSERVATIONS	2/ 2	2/ 2	2/ 2	2/ 2	1/ 1	2/ 2
DISPOSITION						
-EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2	2/ 2
-PRIMARY NECROPSY (DAY 14)	2/ 2	2/ 2	2/ 2	2/ 2	0/ 0	0/ 0
EYES/EARS/NOSE						
-WET YELLOW MATERIAL UROGENITAL AREA	0/ 0	1/ 1	1/ 1	0/ 0	0/ 0	0/ 0
-DRIED RED MATERIAL AROUND RIGHT EYE	1/ 1	2/ 1	1/ 1	1/ 1	2/ 2	2/ 2
-DRIED RED MATERIAL AROUND LEFT EYE	1/ 1	4/ 2	1/ 1	4/ 2	2/ 2	2/ 2
-DRIED RED MATERIAL AROUND NOSE	4/ 2	2/ 2	4/ 2	4/ 2	2/ 2	1/ 1
-DRIED YELLOW MATERIAL AROUND LEFT EYE	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
-DRIED YELLOW MATERIAL AROUND RIGHT EYE	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
EXCRETA						
-SOFT FECES	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/ 0	1/ 1	0/ 0	0/ 0	2/ 2	2/ 2
-DRIED YELLOW MATERIAL ANOGENITAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2	1/ 1
-DRIED YELLOW MATERIAL VENTRAL TRUNK	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2	1/ 1
-WET YELLOW MATERIAL ANOGENITAL AREA	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0

1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 2

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

TABLE RANGE: GROUP:	1	2	3	4	5	6
NORMAL						
-NO SIGNIFICANT CLINICAL OBSERVATIONS	3/ 2	2/ 2	2/ 2	2/ 2	2/ 2	2/ 2
DISPOSITION						
-EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2	2/ 2
-PRIMARY NECROPSY (DAY 14)	2/ 2	2/ 2	2/ 2	2/ 2	0/ 0	0/ 0
BEHAVIOR/CNS						
-VOCALIZATION UPON HANDLING	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
BODY/INTEGUMENT						
-HAIR LOSS FACIAL AREA	0/ 0	2/ 2	0/ 0	0/ 0	0/ 0	0/ 0
-HAIR LOSS FORELIMB(S)	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
EYES/EARS/NOSE						
-WET YELLOW MATERIAL UROGENITAL AREA	1/ 1	0/ 0	0/ 0	0/ 0	2/ 1	1/ 1
-DRIED RED MATERIAL AROUND RIGHT EYE	2/ 2	2/ 2	1/ 1	0/ 0	1/ 1	1/ 1
-DRIED RED MATERIAL AROUND LEFT EYE	1/ 1	2/ 2	1/ 1	0/ 0	2/ 1	1/ 1
-DRIED RED MATERIAL AROUND NOSE	2/ 2	2/ 2	2/ 2	3/ 2	3/ 2	1/ 1
-DRIED YELLOW MATERIAL AROUND LEFT EYE	1/ 1	0/ 0	1/ 1	0/ 0	0/ 0	1/ 1
-DRIED YELLOW MATERIAL AROUND RIGHT EYE	1/ 1	0/ 0	1/ 1	0/ 0	0/ 0	1/ 1
1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 3

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

TABLE RANGE: GROUP:	1	2	3	4	5	6
DAY 000 TO DAY 014						
EYES/EARS/NOSE						
-DRIED YELLOW MATERIAL AROUND NOSE	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	1/ 1
EXCRETA						
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/ 0	1/ 1	0/ 0	0/ 0	2/ 1	1/ 1
-DRIED YELLOW MATERIAL ANOGENITAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-DRIED YELLOW MATERIAL HINDLIMB(S)	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-WET YELLOW MATERIAL ANOGENITAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-WET YELLOW MATERIAL HINDLIMB(S)	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-WET YELLOW MATERIAL VENTRAL TRUNK	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
BODY/INTEG II						
-SCABBING VENTRAL TRUNK	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-SCABBING HINDLIMB(S)	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-SCABBING FORELIMB(S)	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0

1- UNTREATED 2- 0 MG/KG/DAY 3- 100 MG/KG/DAY 4- 300 MG/KG/DAY 5- 1000 MG/KG/DAY 6- 1290 MG/KG/DAY

PCSUv4.07
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S3 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF POST-DOSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 1

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

TABLE RANGE:	DAY 0 TO DAY 13					
GROUP:	1	2	3	4	5	6

NORMAL

TIME OF DOSE

-NO SIGNIFICANT CLINICAL OBSERVATIONS 28/2 28/2 28/2 28/2 12/2 11/2

1-2 HOUR POST-DOSING

-NO SIGNIFICANT CLINICAL OBSERVATIONS 28/2 28/2 28/2 28/2 14/2 14/2

SPECIAL II

TIME OF DOSE

-VOCALIZATION DURING DOSING 0/0 0/0 0/0 0/0 1/1 1/1

1- UNTREATED 2- 0 MG/KG/DAY 3- 100 MG/KG/DAY 4- 300 MG/KG/DAY 5- 1000 MG/KG/DAY 6- 1290 MG/KG/DAY

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S3 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF POST-DOSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 2

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

TABLE RANGE:		DAY 0 TO DAY 13					
GROUP:		1	2	3	4	5	6
NORMAL							
TIME OF DOSE							
-NO SIGNIFICANT CLINICAL OBSERVATIONS		28/2	28/2	28/2	28/2	17/2	13/2
1-2 HOUR POST-DOSING							
-NO SIGNIFICANT CLINICAL OBSERVATIONS		28/2	28/2	28/2	28/2	20/2	12/2
EYES/EARS/NOSE							
1-2 HOUR POST-DOSING							
-WET YELLOW MATERIAL UROGENITAL AREA		0/0	0/0	0/0	0/0	0/0	2/2
SPECIAL II							
TIME OF DOSE							
-VOCALIZATION DURING DOSING		0/0	0/0	0/0	0/0	3/1	1/1
1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY		

PPDTSUv1.48
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S4
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF DERMAL OBSERVATIONS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 1

----- M A L E -----						
TABLE RANGE: GROUP:	1	2	3	4	5	6
DAY 000 TO DAY 014						
DERMAL OBS						
-SCORED, NOT REMARKABLE	30/ 2	9/ 2	11/ 2	8/ 2	7/ 2	6/ 2
-NO ERYTHEMA	0/ 0	21/ 2	15/ 2	12/ 2	1/ 1	2/ 2
-ERYTHEMA - VERY SLIGHT	0/ 0	0/ 0	4/ 2	8/ 2	1/ 1	0/ 0
-ERYTHEMA - SLIGHT	0/ 0	0/ 0	0/ 0	2/ 2	3/ 2	6/ 2
-ERYTHEMA - MODERATE	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0
-NO EDEMA	0/ 0	21/ 2	19/ 2	22/ 2	2/ 2	2/ 2
-EDEMA - VERY SLIGHT	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0
-EDEMA - SLIGHT	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-EDEMA - MODERATE	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	6/ 2
-DESQUAMATION	0/ 0	0/ 0	6/ 1	0/ 0	6/ 2	6/ 2
-EXFOLIATION	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0
-RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE	0/ 0	21/ 2	17/ 2	21/ 2	1/ 1	2/ 2
1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S4
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF DERMAL OBSERVATIONS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 2

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

TABLE RANGE: GROUP:	1	2	3	4	5	6
DAY 000 TO DAY 014						
DERMAL OBS						
-SCORED, NOT REMARKABLE	30/ 2	10/ 2	8/ 2	11/ 2	8/ 2	8/ 2
-NO ERYTHEMA	0/ 0	20/ 2	22/ 2	19/ 2	2/ 1	0/ 0
-ERYTHEMA - VERY SLIGHT	0/ 0	0/ 0	0/ 0	0/ 0	9/ 2	1/ 1
-ERYTHEMA - SLIGHT	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	5/ 2
-NO EDEMA	0/ 0	20/ 2	22/ 2	19/ 2	5/ 1	0/ 0
-EDEMA - VERY SLIGHT	0/ 0	0/ 0	0/ 0	0/ 0	5/ 2	0/ 0
-EDEMA - SLIGHT	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 2
-EDEMA - MODERATE	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	4/ 2
-DESQUAMATION	0/ 0	0/ 0	0/ 0	0/ 0	12/ 2	6/ 2
-ENCRUSTATION	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
-RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE	0/ 0	20/ 2	22/ 2	19/ 2	2/ 2	0/ 0
1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY	

PCSUv4.07
01/07/2011
R:01/07/2011

TABLE S5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHTS [G]

		MALES						
GROUP:		UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY	
DAY	-7							
	MEAN	206.	214.	219.	209.	210.	201.	
%	DIFFERENCE		3.9	6.3	1.5	1.9	-2.4	
	S.D.	7.8	12.0	7.1	9.9	9.9	4.2	
	N	2	2	2	2	2	2	
	-1							
	MEAN	252.	260.	266.	255.	258.	254.	
%	DIFFERENCE		3.2	5.6	1.2	2.4	0.8	
	S.D.	10.6	4.9	9.9	11.3	11.3	25.5	
	N	2	2	2	2	2	2	
	0							
	MEAN	263.	271.	278.	264.	269.	268.	
%	DIFFERENCE		3.0	5.7	0.4	2.3	1.9	
	S.D.	9.9	1.4	6.4	10.6	14.8	22.6	
	N	2	2	2	2	2	2	
	7							
	MEAN	302.	298.	296.	285.	NA	NA	
%	DIFFERENCE		-1.3	-2.0	-5.6			
	S.D.	21.2	3.5	14.1	27.6			
	N	2	2	2	2			
	13							
	MEAN	325.	310.	313.	305.	NA	NA	
%	DIFFERENCE		-4.6	-3.7	-6.2			
	S.D.	31.1	2.1	22.6	27.6			
	N	2	2	2	2			
NA = NOT APPLICABLE								

NA = NOT APPLICABLE

TABLE S5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHTS [G]

		FEMALES						
GROUP:		UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY	
DAY	-7							
	MEAN	177.	171.	176.	177.	181.	180.	
%	DIFFERENCE		-3.4	-0.6	0.0	2.3	1.7	
	S.D.	7.8	2.1	18.4	19.8	15.6	2.8	
	N	2	2	2	2	2	2	
	-1							
	MEAN	184.	187.	186.	186.	191.	192.	
%	DIFFERENCE		1.6	1.1	1.1	3.8	4.3	
	S.D.	11.3	6.4	15.6	6.4	26.2	10.6	
	N	2	2	2	2	2	2	
	0							
	MEAN	193.	186.	193.	195.	196.	202.	
%	DIFFERENCE		-3.6	0.0	1.0	1.6	4.7	
	S.D.	9.2	9.9	12.7	11.3	18.4	7.1	
	N	2	2	2	2	2	2	
	7							
	MEAN	198.	200.	204.	204.	200.	NA	
%	DIFFERENCE		1.0	3.0	3.0	1.0		
	S.D.	9.9	1.4	21.2	2.8	28.3		
	N	2	2	2	2	2		
	13							
	MEAN	213.	203.	213.	222.	NA	NA	
%	DIFFERENCE		-4.7	0.0	4.2			
	S.D.	3.5	2.1	26.9	9.2			
	N	2	2	2	2			

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHT CHANGES [G]

PAGE 1

GROUP:		MALES					
		UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
DAY	-7 TO -1						
	MEAN	46.	46.	47.	46.	48.	53.
	S.D.	2.8	7.1	2.8	1.4	1.4	21.2
	N	2	2	2	2	2	2
	-1 TO 0						
	MEAN	12.	12.	12.	9.	11.	14.
	S.D.	0.7	3.5	3.5	0.7	3.5	2.8
	N	2	2	2	2	2	2
	0 TO 7						
	MEAN	39.	27.	19.	21.	NA	NA
	S.D.	11.3	4.9	7.8	17.0		
	N	2	2	2	2		
	7 TO 13						
	MEAN	23.	12.	17.	20.	NA	NA
	S.D.	9.9	1.4	8.5	0.0		
	N	2	2	2	2		

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHT CHANGES [G]

PAGE 2

GROUP:		UNTREATED	0 MG/KG/DAY	FEMALES 100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
DAY	-7 TO -1						
	MEAN	8.	16.	10.	9.	10.	12.
	S.D.	3.5	8.5	2.8	13.4	10.6	7.8
	N	2	2	2	2	2	2
	-1 TO 0						
	MEAN	9.	-1.	7.	10.	6.	11.
	S.D.	2.1	3.5	2.8	4.9	7.8	3.5
	N	2	2	2	2	2	2
	0 TO 7						
	MEAN	6.	14.	11.	9.	4.	NA
	S.D.	0.7	11.3	8.5	8.5	9.9	
	N	2	2	2	2	2	
	7 TO 13						
	MEAN	15.	3.	9.	18.	NA	NA
	S.D.	6.4	0.7	5.7	6.4		
	N	2	2	2	2		

NA = NOT APPLICABLE

PBFSTv5.32
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 1

		MALES					
GROUP:		UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
DAY	0 TO 7						
	MEAN	39.	27.	19.	21.	NA	NA
	S.D.	11.3	4.9	7.8	17.0		
	N	2	2	2	2		
	0 TO 13						
	MEAN	62.	39.	36.	41.	NA	NA
	S.D.	21.2	3.5	16.3	17.0		
	N	2	2	2	2		

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 2

GROUP:		UNTREATED	0 MG/KG/DAY	FEMALES 100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
DAY	0 TO 7						
	MEAN	6.	14.	11.	9.	4.	NA
	S.D.	0.7	11.3	8.5	8.5	9.9	
	N	2	2	2	2	2	
	0 TO 13						
	MEAN	20.	17.	20.	27.	NA	NA
	S.D.	5.7	12.0	14.1	2.1		
	N	2	2	2	2		

NA = NOT APPLICABLE

PBFSTv5.32
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF FOOD CONSUMPTION [G/ANIMAL/DAY]

PAGE 1

GROUP:		UNTREATED	0 MG/KG/DAY	MALES			1000 MG/KG/DAY	1290 MG/KG/DAY
				100 MG/KG/DAY	300 MG/KG/DAY			
DAY	-7 TO -1							
	MEAN	29.	30.	29.	29.	28.	31.	
	S.D.	2.1	1.4	1.4	1.4	0.0	3.5	
	N	2	2	2	2	2	2	
	0 TO 7							
	MEAN	38.	37.	38.	27.	NA	NA	
	S.D.	0.0	0.0	0.7	0.0			
	N	2	2	2	1			
	7 TO 13							
	MEAN	39.	39.	NA	31.	NA	NA	
	S.D.	0.0	0.0		0.0			
	N	1	1		1			

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF FOOD CONSUMPTION [G/ANIMAL/DAY]

PAGE 2

GROUP:		UNTREATED	0 MG/KG/DAY	FEMALES 100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
DAY	-7 TO -1						
	MEAN	24.	21.	22.	22.	23.	23.
	S.D.	3.5	0.0	1.4	2.1	2.8	3.5
	N	2	2	2	2	2	2
	0 TO 7						
	MEAN	27.	27.	26.	30.	24.	NA
	S.D.	0.7	2.1	0.0	1.4	0.0	
	N	2	2	1	2	1	
	7 TO 13						
	MEAN	29.	30.	30.	29.	NA	NA
	S.D.	3.5	2.1	0.0	0.0		
	N	2	2	1	1		

NA = NOT APPLICABLE

PBFSTv5.32
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S9 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF MACROSCOPIC FINDINGS

PAGE 1

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

GROUP:	M A L E					
	1	2	3	4	5	6
NUMBER OF ANIMALS IN DOSE GROUP	2	2	2	2	2	2
NUMBER OF ANIMALS EXAMINED	0	0	0	0	2	2
HARDERIAN GLANDS -PALE	0	0	0	0	1	0
LN, AXILLARY -ENLARGED	0	0	0	0	2	2
SKIN -MATTING, YELLOW	0	0	0	0	1	0
SKIN, TREATED -THICKENED -SCABBING	0 0	0 0	0 0	0 0	2 1	2 1
1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S9 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF MACROSCOPIC FINDINGS

PAGE 2

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

GROUP:	F E M A L E					
	1	2	3	4	5	6
NUMBER OF ANIMALS IN DOSE GROUP	2	2	2	2	2	2
NUMBER OF ANIMALS EXAMINED	0	0	0	0	2	2
HARDERIAN GLANDS						
-PALE	0	0	0	0	1	0
LN, AXILLARY						
-ENLARGED	0	0	0	0	2	1
LN, INGUINAL						
-ENLARGED	0	0	0	0	0	1
SKIN						
-MATTING, YELLOW	0	0	0	0	0	1
-SCABBING	0	0	0	0	1	0
SKIN, TREATED						
-THICKENED	0	0	0	0	0	1
-SCABBING	0	0	0	0	1	0
1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY	

PGRSI2v4.09
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S10 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF MACROSCOPIC FINDINGS

PAGE 1

SCHEDULED NECROPSY						

GROUP:	1	2	M A L E	4	5	6

NUMBER OF ANIMALS IN DOSE GROUP	2	2	2	2	2	2
NUMBER OF ANIMALS EXAMINED DAY 14	2	2	2	2	0	0
LN, MANDIBULAR						
-ENLARGED	0	2	0	0	0	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	2	0	2	2	0	0

1- UNTREATED	2- 0 MG/KG/DAY	3- 100 MG/KG/DAY	4- 300 MG/KG/DAY	5- 1000 MG/KG/DAY	6- 1290 MG/KG/DAY	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S10 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF MACROSCOPIC FINDINGS

PAGE 2

SCHEDULED NECROPSY

GROUP:	F E M A L E					
	1	2	3	4	5	6
NUMBER OF ANIMALS IN DOSE GROUP	2	2	2	2	2	2
NUMBER OF ANIMALS EXAMINED DAY 14	2	2	2	2	0	0
KIDNEYS						
-AREA(S), DEPRESSED	0	0	1	0	0	0
LN, AXILLARY						
-ENLARGED	0	0	0	1	0	0
STOMACH						
-AREA(S), DARK RED	0	1	1	0	0	0
-TRICHOBEZOAR	0	1	0	0	0	0
THYMUS						
-AREA(S), DARK RED	0	1	0	0	0	0
UTERUS						
-CONTENTS, CLEAR FLUID	2	0	0	1	0	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	0	0	1	1	0	0
1- UNTREATED						
2- 0 MG/KG/DAY						
3- 100 MG/KG/DAY						
4- 300 MG/KG/DAY						
5- 1000 MG/KG/DAY						
6- 1290 MG/KG/DAY						

PGRSI2v4.09
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

PAGE 1

GROUP:	MALES					
	UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
FINAL BODY WT (G)						
MEAN	286.	277.	284.	271.	NA	NA
% DIFFERENCE		-3.1	-0.7	-5.2		
S.D.	22.6	0.0	14.8	28.3		
N	2	2	2	2		
ADRENAL GLANDS (G)						
MEAN	0.0674	0.0649	0.0667	0.0556	NA	NA
% DIFFERENCE		-3.7	-1.0	-17.5		
S.D.	0.01344	0.00304	0.02772	0.00184		
N	2	2	2	2		
ADRENAL GLANDS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.023	0.023	0.023	0.021	NA	NA
% DIFFERENCE		0.0	0.0	-8.7		
S.D.	0.0028	0.0011	0.0086	0.0028		
N	2	2	2	2		
ADRENAL GLANDS (G/100 G BRAIN)						
MEAN	3.453	3.342	3.393	2.767	NA	NA
% DIFFERENCE		-3.2	-1.7	-19.9		
S.D.	0.8100	0.0593	1.3652	0.0448		
N	2	2	2	2		
BRAIN (G)						
MEAN	1.96	1.94	1.96	2.01	NA	NA
% DIFFERENCE		-1.0	0.0	2.6		
S.D.	0.071	0.057	0.028	0.099		
N	2	2	2	2		
NA = NOT APPLICABLE						

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	MALES					
	UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
BRAIN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.688	0.700	0.692	0.748	NA	NA
% DIFFERENCE		1.7	0.6	8.7		
S.D.	0.0792	0.0204	0.0263	0.1146		
N	2	2	2	2		
EPIDIDYIMIDES (G)						
MEAN	0.78	0.76	0.84	0.70	NA	NA
% DIFFERENCE		-2.6	7.7	-10.3		
S.D.	0.007	0.092	0.113	0.028		
N	2	2	2	2		
EPIDIDYIMIDES (G/100 G FINAL BODY WEIGHT)						
MEAN	0.272	0.273	0.296	0.259	NA	NA
% DIFFERENCE		0.4	8.8	-4.8		
S.D.	0.0190	0.0332	0.0244	0.0166		
N	2	2	2	2		
EPIDIDYIMIDES (G/100 G BRAIN)						
MEAN	39.573	39.003	42.820	34.903	NA	NA
% DIFFERENCE		-1.4	8.2	-11.8		
S.D.	1.7884	5.8756	5.1544	3.1262		
N	2	2	2	2		
HEART (G)						
MEAN	1.29	1.23	1.22	1.14	NA	NA
% DIFFERENCE		-4.7	-5.4	-11.6		
S.D.	0.042	0.007	0.099	0.205		
N	2	2	2	2		
NA = NOT APPLICABLE						

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	MALES					
	UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
HEART (G/100 G FINAL BODY WEIGHT)						
MEAN	0.453	0.442	0.430	0.417	NA	NA
% DIFFERENCE		-2.4	-5.1	-7.9		
S.D.	0.0507	0.0026	0.0124	0.0321		
N	2	2	2	2		
HEART (G/100 G BRAIN)						
MEAN	65.820	63.166	62.215	56.788	NA	NA
% DIFFERENCE		-4.0	-5.5	-13.7		
S.D.	0.2104	1.4774	4.1530	12.9989		
N	2	2	2	2		
KIDNEYS (G)						
MEAN	2.84	2.93	2.91	2.93	NA	NA
% DIFFERENCE		3.2	2.5	3.2		
S.D.	0.361	0.127	0.141	0.042		
N	2	2	2	2		
KIDNEYS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.989	1.058	1.027	1.086	NA	NA
% DIFFERENCE		7.0	3.8	9.8		
S.D.	0.0478	0.0459	0.0039	0.0977		
N	2	2	2	2		
KIDNEYS (G/100 G BRAIN)						
MEAN	145.069	151.191	148.433	146.000	NA	NA
% DIFFERENCE		4.2	2.3	0.6		
S.D.	23.6329	10.9694	5.0734	9.3014		
N	2	2	2	2		
NA = NOT APPLICABLE						

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

PAGE 4

		MALES					
GROUP:		UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
LIVER (G)							
MEAN		10.91	11.09	10.94	9.86	NA	NA
% DIFFERENCE			1.6	0.3	-9.6		
S.D.		0.085	0.276	0.870	0.785		
N		2	2	2	2		
LIVER (G/100 G FINAL BODY WEIGHT)							
MEAN		3.825	4.002	3.854	3.641	NA	NA
% DIFFERENCE			4.6	0.8	-4.8		
S.D.		0.2730	0.0996	0.1049	0.0904		
N		2	2	2	2		
LIVER (G/100 G BRAIN)							
MEAN		557.073	571.428	557.646	491.857	NA	NA
% DIFFERENCE			2.6	0.1	-11.7		
S.D.		24.4268	2.4439	36.3271	63.2738		
N		2	2	2	2		
PITUITARY (G)							
MEAN		0.0107	0.0110	0.0115	0.0112	NA	NA
% DIFFERENCE			2.8	7.5	4.7		
S.D.		0.00148	0.00057	0.00255	0.00042		
N		2	2	2	2		
PITUITARY (G/100 G FINAL BODY WEIGHT)							
MEAN		0.004	0.004	0.004	0.004	NA	NA
% DIFFERENCE			0.0	0.0	0.0		
S.D.		0.0002	0.0002	0.0007	0.0003		
N		2	2	2	2		
NA = NOT APPLICABLE							

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	MALES					
	UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
PITUITARY (G/100 G BRAIN)						
MEAN	0.545	0.568	0.586	0.558	NA	NA
% DIFFERENCE		4.2	7.5	2.4		
S.D.	0.0954	0.0457	0.1214	0.0486		
N	2	2	2	2		
PROSTATE (G)						
MEAN	0.64	0.43	0.57	0.46	NA	NA
% DIFFERENCE		-32.8	-10.9	-28.1		
S.D.	0.085	0.106	0.042	0.007		
N	2	2	2	2		
PROSTATE (G/100 G FINAL BODY WEIGHT)						
MEAN	0.223	0.153	0.201	0.169	NA	NA
% DIFFERENCE		-31.4	-9.9	-24.2		
S.D.	0.0120	0.0383	0.0044	0.0202		
N	2	2	2	2		
PROSTATE (G/100 G BRAIN)						
MEAN	32.752	21.837	29.069	22.656	NA	NA
% DIFFERENCE		-33.3	-11.2	-30.8		
S.D.	5.5108	4.8306	1.7451	0.7640		
N	2	2	2	2		
SPLEEN (G)						
MEAN	0.59	0.66	0.64	0.58	NA	NA
% DIFFERENCE		11.9	8.5	-1.7		
S.D.	0.000	0.226	0.000	0.127		
N	2	2	2	2		
NA = NOT APPLICABLE						

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	MALES					
	UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
SPLEEN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.207	0.238	0.226	0.213	NA	NA
% DIFFERENCE		15.0	9.2	2.9		
S.D.	0.0164	0.0817	0.0118	0.0248		
N	2	2	2	2		
SPLEEN (G/100 G BRAIN)						
MEAN	30.122	33.865	32.656	29.047	NA	NA
% DIFFERENCE		12.4	8.4	-3.6		
S.D.	1.0867	10.6761	0.4713	7.7629		
N	2	2	2	2		
TESTES (G)						
MEAN	3.22	3.10	3.38	2.96	NA	NA
% DIFFERENCE		-3.7	5.0	-8.1		
S.D.	0.240	0.198	0.078	0.368		
N	2	2	2	2		
TESTES (G/100 G FINAL BODY WEIGHT)						
MEAN	1.133	1.119	1.191	1.091	NA	NA
% DIFFERENCE		-1.2	5.1	-3.7		
S.D.	0.1737	0.0715	0.0350	0.0218		
N	2	2	2	2		
TESTES (G/100 G BRAIN)						
MEAN	164.171	159.713	172.183	147.894	NA	NA
% DIFFERENCE		-2.7	4.9	-9.9		
S.D.	6.3433	5.5487	1.4833	25.5772		
N	2	2	2	2		
NA = NOT APPLICABLE						

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

		MALES					
GROUP:		UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY

THYMUS (G)							
MEAN		0.4366	0.4194	0.3532	0.4544	NA	NA
% DIFFERENCE			-3.9	-19.1	4.1		
S.D.		0.05105	0.00743	0.14807	0.14559		
N		2	2	2	2		
THYMUS (G/100 G FINAL BODY WEIGHT)							
MEAN		0.154	0.151	0.123	0.166	NA	NA
% DIFFERENCE			-1.9	-20.1	7.8		
S.D.		0.0300	0.0027	0.0458	0.0364		
N		2	2	2	2		
THYMUS (G/100 G BRAIN)							
MEAN		22.243	21.620	17.968	22.811	NA	NA
% DIFFERENCE			-2.8	-19.2	2.6		
S.D.		1.8023	0.2477	7.2952	8.3669		
N		2	2	2	2		
THYROID/SPARATHY (G)							
MEAN		0.0254	0.0188	0.0207	0.0227	NA	NA
% DIFFERENCE			-26.0	-18.5	-10.6		
S.D.		0.00007	0.00014	0.00148	0.00474		
N		2	2	2	2		
THYROID/SPARATHY (G/100 G FINAL BODY WEIGHT)							
MEAN		0.009	0.007	0.007	0.009	NA	NA
% DIFFERENCE			-22.2	-22.2	0.0		
S.D.		0.0007	0.0000	0.0000	0.0007		
N		2	2	2	2		

NA = NOT APPLICABLE							

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

PAGE 8

		MALES					
GROUP:	UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY	
THYROIDS/PARATHY (G/100 G BRAIN)							
MEAN	1.295	0.970	1.053	1.134	NA	NA	
% DIFFERENCE		-25.1	-18.7	-12.4			
S.D.	0.0502	0.0205	0.0608	0.2913			
N	2	2	2	2			

NA = NOT APPLICABLE

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	UNTREATED	0 MG/KG/DAY	FEMALES			1000 MG/KG/DAY	1290 MG/KG/DAY
			100 MG/KG/DAY	300 MG/KG/DAY			
FINAL BODY WT (G)							
MEAN	189.	175.	188.	196.	NA	NA	
% DIFFERENCE		-7.4	-0.5	3.7			
S.D.	2.1	3.5	18.4	7.8			
N	2	2	2	2			
ADRENAL GLANDS (G)							
MEAN	0.0684	0.0770	0.0799	0.0737	NA	NA	
% DIFFERENCE		12.6	16.8	7.7			
S.D.	0.01146	0.00721	0.00141	0.00134			
N	2	2	2	2			
ADRENAL GLANDS (G/100 G FINAL BODY WEIGHT)							
MEAN	0.036	0.044	0.043	0.038	NA	NA	
% DIFFERENCE		22.2	19.4	5.6			
S.D.	0.0057	0.0050	0.0049	0.0008			
N	2	2	2	2			
ADRENAL GLANDS (G/100 G BRAIN)							
MEAN	3.714	4.215	4.188	4.064	NA	NA	
% DIFFERENCE		13.5	12.8	9.4			
S.D.	0.6920	0.1502	0.3986	0.1952			
N	2	2	2	2			
BRAIN (G)							
MEAN	1.85	1.83	1.92	1.82	NA	NA	
% DIFFERENCE		-1.1	3.8	-1.6			
S.D.	0.035	0.106	0.148	0.120			
N	2	2	2	2			
NA = NOT APPLICABLE							

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	UNTREATED	FEMALES				
		0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY

BRAIN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.979	1.047	1.020	0.928	NA	NA
% DIFFERENCE		6.9	4.2	-5.2		
S.D.	0.0298	0.0820	0.0207	0.0246		
N	2	2	2	2		
HEART (G)						
MEAN	0.84	0.73	0.80	0.81	NA	NA
% DIFFERENCE		-13.1	-4.8	-3.6		
S.D.	0.014	0.000	0.000	0.057		
N	2	2	2	2		
HEART (G/100 G FINAL BODY WEIGHT)						
MEAN	0.446	0.418	0.428	0.415	NA	NA
% DIFFERENCE		-6.3	-4.0	-7.0		
S.D.	0.0125	0.0085	0.0418	0.0455		
N	2	2	2	2		
HEART (G/100 G BRAIN)						
MEAN	45.529	40.068	41.901	44.830	NA	NA
% DIFFERENCE		-12.0	-8.0	-1.5		
S.D.	0.1065	2.3287	3.2491	6.0858		
N	2	2	2	2		
KIDNEYS (G)						
MEAN	2.03	1.87	1.91	1.85	NA	NA
% DIFFERENCE		-7.9	-5.9	-8.9		
S.D.	0.148	0.205	0.042	0.064		
N	2	2	2	2		

NA = NOT APPLICABLE						

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

PAGE 11

GROUP:		UNTREATED	0 MG/KG/DAY	FEMALES		300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
				100 MG/KG/DAY				

KIDNEYS (G/100 G FINAL BODY WEIGHT)								
MEAN		1.075	1.068	1.022		0.944	NA	NA
% DIFFERENCE			-0.7	-4.9		-12.2		
S.D.		0.0909	0.0959	0.1225		0.0050		
N		2	2	2		2		
KIDNEYS (G/100 G BRAIN)								
MEAN		109.699	102.692	100.126		101.760	NA	NA
% DIFFERENCE			-6.4	-8.7		-7.2		
S.D.		5.9463	17.2045	9.9795		3.2334		
N		2	2	2		2		
LIVER (G)								
MEAN		7.82	5.93	6.98		7.63	NA	NA
% DIFFERENCE			-24.2	-10.7		-2.4		
S.D.		0.042	0.714	0.368		0.509		
N		2	2	2		2		
LIVER (G/100 G FINAL BODY WEIGHT)								
MEAN		4.149	3.392	3.721		3.911	NA	NA
% DIFFERENCE			-18.2	-10.3		-5.7		
S.D.		0.0242	0.3405	0.1683		0.4160		
N		2	2	2		2		
LIVER (G/100 G BRAIN)								
MEAN		423.948	326.346	364.843		422.241	NA	NA
% DIFFERENCE			-23.0	-13.9		-0.4		
S.D.		10.4235	58.0997	9.0899		56.0156		
N		2	2	2		2		

NA = NOT APPLICABLE								

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	UNTREATED	0 MG/KG/DAY	FEMALES			
			100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY
OVARIES/OVIDUCTS (G)						
MEAN	0.1216	0.1228	0.1118	0.1177	NA	NA
% DIFFERENCE		1.0	-8.1	-3.2		
S.D.	0.00453	0.01570	0.02157	0.00064		
N	2	2	2	2		
OVARIES/OVIDUCTS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.064	0.070	0.059	0.060	NA	NA
% DIFFERENCE		9.4	-7.8	-6.3		
S.D.	0.0017	0.0104	0.0057	0.0021		
N	2	2	2	2		
OVARIES/OVIDUCTS (G/100 G BRAIN)						
MEAN	6.594	6.715	5.809	6.495	NA	NA
% DIFFERENCE		1.8	-11.9	-1.5		
S.D.	0.3716	0.4699	0.6757	0.3951		
N	2	2	2	2		
PITUITARY (G)						
MEAN	0.0131	0.0123	0.0134	0.0128	NA	NA
% DIFFERENCE		-6.1	2.3	-2.3		
S.D.	0.00205	0.00269	0.00113	0.00148		
N	2	2	2	2		
PITUITARY (G/100 G FINAL BODY WEIGHT)						
MEAN	0.007	0.007	0.007	0.007	NA	NA
% DIFFERENCE		0.0	0.0	0.0		
S.D.	0.0012	0.0017	0.0001	0.0010		
N	2	2	2	2		
NA = NOT APPLICABLE						

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

GROUP:	UNTREATED	0 MG/KG/DAY	FEMALES			1290 MG/KG/DAY
			100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	
PITUITARY (G/100 G BRAIN)						
MEAN	0.706	0.671	0.700	0.707	NA	NA
% DIFFERENCE		-5.0	-0.8	0.1		
S.D.	0.0976	0.1082	0.0048	0.1286		
N	2	2	2	2		
SPLEEN (G)						
MEAN	0.42	0.32	0.37	0.42	NA	NA
% DIFFERENCE		-23.8	-11.9	0.0		
S.D.	0.057	0.057	0.049	0.028		
N	2	2	2	2		
SPLEEN (G/100 G FINAL BODY WEIGHT)						
MEAN	0.223	0.183	0.194	0.215	NA	NA
% DIFFERENCE		-17.9	-13.0	-3.6		
S.D.	0.0325	0.0287	0.0074	0.0230		
N	2	2	2	2		
SPLEEN (G/100 G BRAIN)						
MEAN	22.739	17.654	19.017	23.243	NA	NA
% DIFFERENCE		-22.4	-16.4	2.2		
S.D.	2.6303	4.1257	1.1101	3.0978		
N	2	2	2	2		
THYMUS (G)						
MEAN	0.2887	0.3270	0.3251	0.3537	NA	NA
% DIFFERENCE		13.3	12.6	22.5		
S.D.	0.01747	0.09440	0.01138	0.03719		
N	2	2	2	2		
NA = NOT APPLICABLE						

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

PAGE 14

GROUP:	UNTREATED	0 MG/KG/DAY	FEMALES			1290 MG/KG/DAY
			100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	

THYMUS (G/100 G FINAL BODY WEIGHT)						
MEAN	0.153	0.187	0.174	0.181	NA	NA
% DIFFERENCE		22.2	13.7	18.3		
S.D.	0.0110	0.0503	0.0231	0.0118		
N	2	2	2	2		
THYMUS (G/100 G BRAIN)						
MEAN	15.639	18.096	17.048	19.462	NA	NA
% DIFFERENCE		15.7	9.0	24.4		
S.D.	0.6470	6.2242	1.9164	0.7602		
N	2	2	2	2		
THYROID/SPARATHY (G)						
MEAN	0.0235	0.0233	0.0230	0.0141	NA	NA
% DIFFERENCE		-0.9	-2.1	-40.0		
S.D.	0.00007	0.00177	0.00346	0.00163		
N	2	2	2	2		
THYROID/SPARATHY (G/100 G FINAL BODY WEIGHT)						
MEAN	0.013	0.013	0.013	0.008	NA	NA
% DIFFERENCE		0.0	0.0	-38.5		
S.D.	0.0007	0.0014	0.0035	0.0007		
N	2	2	2	2		
THYROID/SPARATHY (G/100 G BRAIN)						
MEAN	1.272	1.273	1.209	0.773	NA	NA
% DIFFERENCE		0.1	-5.0	-39.2		
S.D.	0.0205	0.0226	0.2744	0.0382		
N	2	2	2	2		

NA = NOT APPLICABLE						

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE S11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

PAGE 15

		FEMALES					
GROUP:	UNTREATED	0 MG/KG/DAY	100 MG/KG/DAY	300 MG/KG/DAY	1000 MG/KG/DAY	1290 MG/KG/DAY	
UTERUS (G)							
MEAN	0.76	0.42	0.35	0.53	NA	NA	
% DIFFERENCE		-44.7	-53.9	-30.3			
S.D.	0.205	0.057	0.007	0.014			
N	2	2	2	2			
UTERUS (G/100 G FINAL BODY WEIGHT)							
MEAN	0.401	0.241	0.184	0.271	NA	NA	
% DIFFERENCE		-39.9	-54.1	-32.4			
S.D.	0.1133	0.0373	0.0143	0.0036			
N	2	2	2	2			
UTERUS (G/100 G BRAIN)							
MEAN	40.822	22.962	18.056	29.239	NA	NA	
% DIFFERENCE		-43.8	-55.8	-28.4			
S.D.	10.3321	1.7651	1.0308	1.1574			
N	2	2	2	2			

NA = NOT APPLICABLE

POFBSTv5.24
12/30/2010

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 4.8** states that the test substance will be stored at room temperature and protected from light. On 15 November 2010, a retention sample was collected and stored in a clear glass vial and was not protected from light until 20 December 2010.

Reason for Deviation: Technician error.

- **Protocol Section 5.6** states that animals will be uniquely identified by a metal ear tag. However, the additional animals transferred on 18 February 2011 from the WIL Research stock colony were each uniquely identified with a subcutaneous microchip (BMDS system).

Reason for Deviation: Upon receipt animals were identified with BMDS chips.

- **Protocol Section 8.6.1** states that gross lesions from animals in Groups 1-6 would be retained at the time of necropsy. On 12 December 2010, a 1000 mg/kg/day female (no. 90234) was euthanized *in extremis*. At the time of necropsy, harderian glands were noted with gross lesions; however, they were not retained.

Reason for Deviation: Technician error.

These deviations did not negatively impact the quality or integrity of the data nor the outcome of the study.



Study Number: WIL-402021

PROTOCOL AMENDMENT 2

Sponsor: American Petroleum Institute

Title of Study:

A 14-Day Dose Range Finding Dermal Toxicity Study Utilizing Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel) in Sprague Dawley Rats

Protocol Modifications:

In order to select the appropriate doses for the subsequent studies to be conducted with this test article, three additional dose levels will be evaluated. Unless otherwise indicated below, the protocol and amendment(s) will be followed for this additional work. Modifications indicated below are only applicable to the additional dose levels.

1) 5.4 Number of Animals:

Six (6) naïve males and 6 naïve females will be arbitrarily selected from stock and place on study.

2) 5.5 Approximate Age and Weight:

Stock animals assigned to this study will be selected from those closest in age and weight based on the range specified in the protocol.

3) 7.4.1 Organization of Test Groups:

The following table presents the study group arrangement. The dosage levels were selected by the Sponsor's Representatives.

Group Number	Test Substance ^a	Dosage Level (mg/kg/day)	Dose Concentration (mg/mL) ^a	Dose Volume (mL/kg)	Number of Animals	
					Males	Females
7	Test Substance	450	300	1.5	2	2
8	Test Substance	600	400	1.5	2	2
9	Test Substance	750	500	1.5	2	2

^a Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel) which will be formulated w/v in mineral oil.

4) **8.6.1 Macroscopic Examination:**

Tissues will not be collected for these additional groups.

5) **8.6.2 Organ Weights:**

The liver will be weighed and discarded at the scheduled necropsy. No other organs will be weighed.

6) **8.6.3 Microscopic Examination:**

Not applicable these additional groups.

Reasons for Protocol Modification:

- 1-6) Three additional dose levels added to aid in the selection of doses for the subsequent studies to be conducted with this test article. All modifications were implemented at the request of the Sponsor.

Approval:

Sponsor's approval was obtained via e-mail on 2/17/11.

WIL Research Laboratories, LLC

[Redacted Signature]

Study Director

2/17/11
Date

[Redacted Signature]

for: Senior Director, General Toxicology

17-Feb-2011
Date

American Petroleum Institute

[Redacted Signature]

Sponsor Representative

2-17-2011
Date



Study Number: WIL-402021

PROTOCOL AMENDMENT 1

Sponsor: American Petroleum Institute

Title of Study:

A 14-Day Dose Range Finding Dermal Toxicity Study Utilizing Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel) in Sprague Dawley Rats

Protocol Modifications:

1) **7.4.3 Treatment Regimen:**

This section will be replaced with the following:

The vehicle (mineral oil) and test substance formulations will be administered once daily, 7 days a week for approximately 14 days (until the day prior to necropsy). Day 0 is the first day of dosing and Day 14 is the day of the scheduled necropsy. All animals will be collared continuously during the 14-day dosing period. Once per week (on study days 6 and 13) the test site will be gently patted using a disposable paper towel in an effort to remove the residual test substance. If needed, the test site can be gently patted with gauze moistened with the vehicle and then again with dry gauze or disposable paper towel. Group 1 animals will be sham controls and will not receive the test or vehicle control substance; however, all other dosing procedures will be followed for this group.

Reasons for Protocol Modification:

- 1) Change removal of residual test substance from daily (6-hours following dosing) to weekly (approximately 6 hours following dosing).

Approval:

Sponsor's approval was obtained via e-mail on December 3, 2010.

WIL Research Laboratories, LLC

[Redacted Signature]
Study Director

12/3/10
Date

[Redacted Signature]
Senior Director, General Toxicology

3 Dec 2010
Date

American Petroleum Institute

[Redacted Signature]
Sponsor Representative

07 Dec 2010
Date



PROTOCOL

A 14-DAY DOSE RANGE FINDING DERMAL TOXICITY STUDY UTILIZING PETROLEUM PRODUCTS, DIESEL OIL (ULTRA LOW SULFUR DIESEL FUEL) IN SPRAGUE DAWLEY RATS

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:

The objectives of this study are to evaluate the potential irritative and toxicity effects of repeated exposure of Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel) over 14 days, and to assist in dose selection for subsequent dermal toxicity studies (OECD 414 and 411) in Sprague Dawley rats.

This study is a non-GLP study and will be performed according to this protocol as approved by the Sponsor and the applicable Standard Operating Procedures of WIL Research Laboratories, LLC (WIL SOPs).

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
E-mail: [REDACTED]

2.2 WIL Study Director:

[REDACTED]
Senior Toxicologist, Toxicology
Tel: (419) 289-8700
Fax: (419) 289-3650
E-mail: [REDACTED]

2.3 WIL Departmental Responsibilities:

[REDACTED]
Project Specialist, General Toxicology
Emergency Contact
Tel: (419) 289-8700
Fax: (419) 289-3650
E-mail: [REDACTED]

[REDACTED]
President and Chief Operating Officer

[REDACTED]
Senior Director, General Toxicology



[REDACTED]
Assistant Director, Toxicology

[REDACTED]
Director, Informational Systems

[REDACTED]
Clinical Veterinarian, Head of Surgery
and Experimental Medicine

[REDACTED]
Senior Operations Manager, Vivarium

[REDACTED]
Operations Manager, Toxicology

[REDACTED]
Group Manager, Formulations Laboratory

[REDACTED]
Manager, Gross Pathology and
Developmental Toxicology Laboratory

[REDACTED]
Operations Manager, Reporting and
Technical Support Services

3 STUDY SCHEDULE:

Proposed Experimental Starting Date: (Animal Receipt Date)	November 23, 2010
Proposed Experimental Start Date: (Proposed Initiation of Dosing)	December 3, 2010
Proposed Necropsy Date:	December 17, 2010
Proposed Preliminary Audited Data Tables:	Approximately 3 weeks following the scheduled necropsy
Proposed Unaudited Draft Report Date:	Approximately 6-8 weeks following the scheduled necropsy



4 TEST SUBSTANCE INFORMATION:**4.1 Test Substance Shipment:**

Test substance and applicable documentation will be shipped under Sponsor's responsibility to:

Formulations Laboratory (WIL-402021; [REDACTED])
Attn. [REDACTED]
WIL Research Laboratories, LLC
1407 George Road
Ashland, Ohio 44805-8946

4.2 Identification:

Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel) Blend of 7
(CAS 68344-30-5)

4.3 Lot Number:

TBD

4.4 Expiration/Retest Date:

Not applicable for this study. Will be determined prior to the conduct of the GLP definitive studies.

4.5 Purity:

100%

4.6 Stability:

The test substance is considered to be stable under the storage conditions provided by the Sponsor.

4.7 Physical Description:

To be documented by WIL Research Laboratories, LLC.

4.8 Storage Conditions:

Room temperature, protected from light.



4.9 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.

4.10 Personnel Safety:

Routine safety precautions apply. 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) will be provided.

4.11 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 or retained for subsequent studies.

5 TEST SYSTEM:**5.1 Species:**

Rat

5.2 Strain:

CrI:CD(SD)

5.3 Source:

Charles River Laboratories, Inc.
Facility to be documented in the raw data

5.4 Number of Animals:

Fifteen (15) naïve males and 15 naïve females will be purchased. Twelve males and 12 females will be placed on study. Females will be nulliparous and non-pregnant. Animals not utilized on study will be assigned to stock or euthanized by CO₂ inhalation and discarded.



5.5 Approximate Age and Weight:

Animals will be approximately 7-8 weeks of age when received, and approximately 8-9 weeks of age at initiation of dosing. The males will weigh approximately 240 to 340 grams and the females approximately 170 to 270 grams at randomization.

5.6 Identification System:

Animals will be uniquely identified by a metal eartag displaying the animal number. Individual cage cards will be affixed to each cage and will display at least the animal number, group number, sex, and study number.

5.7 Justification for Selection and Number of Animals:

This species and strain of animal is recognized as appropriate for short-term toxicity studies. The CrI:CD(SD) rat will be utilized because it is a widely used strain for which historical control data are available. The number of animals selected is the minimum needed to yield scientifically meaningful data.

6 SPECIFIC MAINTENANCE SCHEDULE:**6.1 Animal Housing:**

Animals will be housed individually in an environmentally controlled room in suspended, wire-mesh cages. The cages will be elevated above cage-board or other suitable material. The cages will be subject to routine cleaning at a frequency consistent with maintaining good animal health. The facilities at WIL Research Laboratories, LLC are fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International).

6.2 Environmental Conditions:

Controls will be set to maintain temperature at $71 \pm 5^\circ\text{F}$ ($22 \pm 3^\circ\text{C}$) and relative humidity at approximately $50 \pm 20\%$. 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 will provide illumination for a 12-hour light/dark photoperiod. Temporary adjustments to the light/dark cycles may be made to accommodate protocol specified activities. 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 will be changed regularly according to Standard Operating Procedures. The municipal water supplying the laboratory will be analyzed for contaminants according to Standard Operating Procedures to ascertain that none are present at concentrations that would be expected to affect the outcome of the study.

6.4 Diet:

PMI Nutrition International, LLC Certified Rodent LabDiet® 5002 (pellet) will be offered *ad libitum* during the study, except during overnight fasting prior to necropsy. Each lot utilized will be identified and recorded. Standard operating procedures provide specifications for acceptable levels of heavy metals and pesticides that are reasonably expected to be present in the diet without interfering with the purpose or conduct of the study. Each lot of feed has been analyzed to assure specifications are met. Feeders will be changed and sanitized once per week.

6.5 Enrichment:

Enrichment devices will be provided to each animal for environmental enrichment and to aid in maintaining the animal's oral health (to be provided starting during acclimation).

7 EXPERIMENTAL DESIGN:

7.1 Animal Receipt and Acclimation:

Each animal will be inspected by qualified personnel upon receipt. Animals judged to be in good health will be placed immediately in acclimation for at least 7 days. All animals will be weighed and assigned a permanent animal number. During the acclimation period, each animal will be observed twice daily for changes in general appearance or behavior.

The animals will be allowed a pretreatment week (during the acclimation period) at which time all animals will be fitted with collars, food consumption will be determined and general health will be monitored, but they will not receive the test substance. All animals will receive a detailed physical examination and body weight determination prior to the time of animal selection for randomization.



7.2 Randomization:

Near the end of the pretest period, animals judged to be suitable for testing will be assigned to groups at random based on body weight stratification into a block design using a computer program. A printout containing the animal numbers and individual group assignments will be generated. Animals will then be arranged into the groups according to the printout. Body weights at randomization will be within $\pm 20\%$ of the mean of each sex. Following randomization, it may be necessary to replace individual animals prior to or shortly after the initiation of dosing, based on the health status of the animals. Replacement animals will be selected from remaining pretest animals and assigned arbitrarily. These instances will be appropriately documented in the study records.

7.3 Route and Rationale of Test Substance Administration:

The route of administration will be dermal since the study objective is to determine the potential toxicity of the test substance when administered by the dermal route.

7.4 Organization of Test Groups, Dosage Levels and Treatment Regimen:**7.4.1 Organization of Test Groups:**

The following table presents the study group arrangement. The dosage levels were selected by the Sponsor's Representatives.

Group Number	Test Substance	Dosage Level (mg/kg/day)	Dose Concentration (mg/mL)	Dose Volume (mL/kg)	Number of Animals	
					Males	Females
1	Sham Control	NA	NA	NA	2	2
2	Vehicle ^a	0	0	1.5	2	2
3	Test Substance ^b	100	66.6	1.5	2	2
4	Test Substance ^b	300	200	1.5	2	2
5	Test Substance ^b	1000	666.6	1.5	2	2
6	Test Substance ^{bc}	1290	Neat	1.5	2	2

^a The vehicle for this study is mineral oil.

^b The test substance used for Groups 3-6 is Petroleum Products, Diesel Oil (Ultra Low Sulfur Diesel Fuel).

^c The specific gravity = 0.86g/mL.



7.4.2 Sham Control:

The Group 1 sham control animals will be subject to the same procedures (i.e. shaving, collaring, sham dosing with glass rod and removal of residual test substance) as animals in Groups 2-6. However, no vehicle or test substance will be applied to the sham control animals.

7.4.3 Treatment Regimen:

The vehicle (mineral oil) and test substance formulations will be administered once daily (6-hour exposure), 7 days a week for approximately 14 days (until the day prior to necropsy). Day 0 is the first day of dosing and Day 14 is the day of the scheduled necropsy. All animals will be collared continuously during the 14-day dosing period. Following each 6-hour exposure the test site will be gently patted using a disposable paper towel in an effort to remove the residual test substance. If needed, the test site can be gently patted with gauze moistened with the vehicle and then again with dry gauze or disposable paper towels. Group 1 animals will be sham controls and will not receive the test or vehicle control substance; however, all other dosing procedures will be followed for this group.

7.4.4 Method of Administration and Dose Calculations:

Prior to administration the back (down each side to the ventral surface) and flanks of each animal will be clipped free of hair using an electric clipper. Additional clipping throughout the study will be performed as necessary.

The vehicle and test substance formulations, adjusted as mL/kg per the most recent body weight, will be spread uniformly over the treatment site (target area of approximately 10% of the body surface area). The area covered by test substance will be measured and recorded once per week for each animal and the resulting approximate % of body surface area covered will be reported. The test substance will be applied to each animal in Groups 2-6 and spread over the area using a glass rod. The area will remain uncovered. Dosing sites will be marked with a permanent marker and remarked as necessary. Animals will be exposed for 14 consecutive days and collared for the duration of the exposure to prevent ingestion of the test substance.



7.5 Preparation and Analysis of Test Substance Formulations:

7.5.1 Method and Frequency of Preparation:

The test substance will be prepared for dosing as a weight-to-volume mixture in mineral oil. The dosing formulations will be prepared daily. A complete and detailed description of the methods of test substance preparation will be included in the study records and described in the final report.

7.5.2 Homogeneity, Stability and Concentration of Test Substance Formulations:

Not applicable for this study. Will be determined prior to the conduct of the GLP definitive studies.

8 PARAMETERS TO BE EVALUATED:

8.1 Viability Observations:

All animals will be observed for mortality and moribundity twice daily, once in the morning and once in the afternoon. Moribund animals will be euthanized by CO₂ inhalation and necropsied as described in section 8.6.1.

8.2 Animals to Be Euthanized in Extremis:

All animals to be euthanized *in extremis* will have a body weight collected and undergo a final detailed physical observation prior to release for euthanasia and subsequent necropsy.

8.3 Clinical Observations:

8.3.1 Daily Observations:

A clinical examination will be performed on all animals at the time of dosing and at approximately 1-2 hours post-dose on each dosing day. Observations will include, but are not limited to, changes in the skin, fur, eyes and mucous membranes; respiratory, circulatory, autonomic and central nervous systems functions; somatomotor activity and behavior patterns. Findings or lack of findings noted at the clinical examination will be recorded for individual animals. Findings noted for individual animals outside of the specified observation periods will also be recorded.



8.3.2 Detailed Physical Examinations:

A detailed physical examination will be conducted at least once during the pretreatment period, and approximately weekly during the study. All animals assigned to study will also receive a detailed physical examination on the days of the scheduled or unscheduled euthanasia. The animals will be removed from their home cages and placed in a standard arena for observations. Observations will be detailed and carefully recorded. Where appropriate an explicitly defined scoring system will be used if in the opinion of the Study Director, and with approval of the Sponsor, doing so increases the utility of the data. Signs noted shall include, but not be limited to, changes in skin, fur, eyes, mucous membranes, occurrence of secretions and excretions and autonomic activity (e.g., lacrimation, piloerection, pupil size, unusual respiratory pattern), changes in gait, posture and response to handling, as well as the presence of clonic or tonic movements, stereotypic behavior (e.g., excessive grooming, repetitive circling) or bizarre behavior (e.g., self-mutilation, walking backwards) will be recorded. The absence or presence of findings will be recorded for individual animals.

8.3.3 Dermal Observations:

Dermal scoring according to the method of Draize (Appendix A) will be conducted daily during the 14-day dosing period (immediately prior to application, on dosing days).

8.4 Individual Body Weights:

Individual body weights will be recorded approximately weekly, beginning during pretest, for the duration of the study. A final fasted body weight will be recorded at the time of necropsy.

8.5 Individual Food Consumption:

Individual food consumption will be recorded approximately weekly, beginning during pretest, for the duration of the study.

8.6 Anatomic Pathology:

8.6.1 Macroscopic Examination:

A complete necropsy examination will be conducted on all animals. Animals *in extremis* or surviving to the scheduled necropsy will be euthanized by CO₂ inhalation. Necropsy will include examination of the external surface; all orifices; and the cranial, thoracic, abdominal and



pelvic cavities including viscera. At the time of necropsy, the following tissues will be collected and placed in 10% neutral-buffered formalin (or other fixative if applicable).

Adrenals (2)	Skin with mammary gland ^d
Aorta	(females only)
Bone with marrow	Skeletal muscle (Rectus femoris)
Sternum	Ovaries (2) with oviducts ^e
Femur with joint	Pancreas
Bone marrow smear (from femur) ^a	Peripheral nerve (sciatic)
Brain	Pituitary
Cerebrum (2 levels)	Prostate
Cerebellum with pons/medulla	Salivary glands [mandibular (2)]
Cervix	Seminal vesicles (2)
Epididymides (2) ^c	Skin
Exorbital lacrimal glands (2)	Treated
Eyes with optic nerves (2) ^b	Sham
Gastrointestinal tract	Untreated (posterior to treated skin)
Esophagus	Spinal cord
Stomach	Cervical
Duodenum	Thoracic
Jejunum	Lumbar
Ileum	Spleen
Cecum	Testes (2) ^e
Colon	Thymus
Rectum	Thyroid with parathyroids (2) ^e
Heart	Trachea
Kidneys (2)	Urinary bladder
Liver (sections of two lobes)	Uterus
Lungs (including bronchi, fixed by inflation with fixative)	Vagina
Lymph node [Axillary and mesenteric (2)]	All gross lesions

^a- Not taken from animals found dead; not placed in formalin; to be examined only if scientifically warranted.

^b- To be placed in Davidson's solution.

^c- To be placed in Bouin's solution.

^d- For females: A corresponding section of skin will be collected from the same anatomical area for males.

^e- If microscopic evaluation is conducted, parathyroids and oviducts will be examined histopathologically if in the plane of section and in all cases where a gross lesion is present.



8.6.2 Organ Weights:

The following organs, from all animals, will be weighed at the scheduled necropsy:

Adrenals (2)	Pituitary gland
Brain	Prostate
Epididymides (2)	Spleen
Heart	Testes (2)
Kidneys (2)	Thymus
Liver	Thyroid with parathyroids (2)*
Ovaries (2)with oviducts	Uterus

Paired organs will be weighed together. Designated (*) organs will be weighed after fixation. Organ-to-body-weight and organ-to-brain-weight ratios will be calculated from animals euthanized at the scheduled necropsy.

8.6.3 Microscopic Examination:

Processing of tissues to slide and subsequent microscopic examination of hematoxylin-eosin stained paraffin sections will only be conducted if deemed necessary in consultation with the Sponsor by protocol amendment (at additional cost).

9 STATISTICAL METHODS:

Statistical evaluations will not be performed due to the small group size.

10 QUALITY ASSURANCE:

This study and the corresponding report will not be audited by the WIL Quality Assurance Unit. However, the data tables for this study will be audited by the WIL Quality Assurance Unit.

11 RECORDS TO BE MAINTAINED:

All original raw data records, as defined by WIL SOPs will be stored in Archives at WIL Research Laboratories, LLC as described in protocol Section 12.



12 WORK PRODUCT:

Sponsor will have title to all documentation records, raw data, slides, specimens, or other work products generated during the performance of the study. All work products including raw paper data, pertinent electronic storage media and specimens will be retained at no charge for a period of 6 months following issuance of the final report in the Archives at WIL Research Laboratories, LLC. Thereafter, WIL Research Laboratories will charge a monthly archiving fee for retention of all work products. All work products 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.

13 REPORTS:

Audited data tables will be prepared and sent to the study monitor approximately 3 weeks after the scheduled necropsy.

The final report will contain a summary, test substance data, methods and procedures, appropriate individual animal and summary data tables, a copy of the protocol and amendments (if any) and an interpretation and discussion of the study results. The final report will be comprehensive and shall attempt to define level(s) inducing toxic effects, including irritation, under the condition of this investigation.

WIL Research Laboratories, LLC will submit an electronic copy (PDF with an MS Word copy of the report text for editing and comments) of the unaudited draft report in a timely manner upon completion of data collection prior to issuance of the final report. It is expected that the Sponsor will review the draft report and provide comments to WIL within a two-month time frame following submission. Within one month following receipt of the Sponsor's comments, WIL shall provide a revised draft report that incorporates the Sponsor's reasonable revisions and suggestions. One revision will be permitted as part of the cost of the study; additional changes or revisions may be made, at extra cost. WIL shall submit the final report within two weeks of receiving authorization from the sponsor. If the Sponsor's comments and/or authorization to finalize the report have not been received at WIL within one year following submission of the draft report, WIL 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 additional paper copies of the final report may result in additional charges.



14 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 Representative. In the event that the Sponsor verbally requests or approves changes in the protocol, documentation will be maintained as e-mail or other suitable correspondence, and may be communicated to WIL Research Laboratory staff in the form of Study Director Notifications, as appropriate.

15 ANIMAL WELFARE ACT COMPLIANCE:

This study will comply with all applicable sections of the Final Rules of the Animal Welfare Act regulations (9 CFR). The Sponsor should make particular note of the following:

- The Sponsor signature on this protocol documents for the Study Director the Sponsor's assurance that the study described 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.

16 PROTOCOL APPROVAL:

Sponsor approval received via E-mail on 12/2/10
Date

American Petroleum Institute

[Redacted Signature]

Sponsor Representative

06 Dec 2010
Date

WIL Research Laboratories, LLC

[Redacted Signature]

Study Director

12/2/10
Date

[Redacted Signature]

Senior Director, Toxicology

3 Dec 2010
Date



APPENDIX A**SCORING CRITERIA FOR DERMAL REACTIONS****Evaluation of Dermal Reactions***

<u>Value</u>	<u>Erythema and Eschar Formation</u>	<u>Computer Designation</u>
0	No erythema	No erythema
1	Very slight erythema (barely perceptible, edges of area not well defined)	Very slight erythema
2	Slight erythema (pale red in color and edges definable)	Slight erythema
3	Moderate to severe erythema (definite red in color and area well defined)	Moderate erythema
4	Severe erythema (beet or crimson red) to slight eschar formation (injuries in depth)	Severe erythema
	<u>Edema Formation</u>	<u>Computer Designation</u>
0	No edema	No edema
1	Very slight edema (barely perceptible, edges of area not well defined)	Very slight edema
2	Slight edema (edges of area well defined by definite raising)	Slight edema
3	Moderate edema (raised approximately 1 mm)	Moderate edema
4	Severe edema (raised more than 1 mm and extending beyond area of exposure)	Severe edema

*Draize, J. H., 1965. The Appraisal of the Safety of Chemicals in Foods, Drugs and Cosmetics. Dermal Toxicity, pp. 46-59. Assoc. of Food and Drug Officials of the U.S., Topeka, Kansas.



APPENDIX B

Pretest Clinical Observations

----- M A L E -----		
TABLE RANGE:	11-26-10 TO 12-02-10	
GROUP:		1
NORMAL		
-NO SIGNIFICANT CLINICAL OBSERVATIONS		30/15
SPECIAL II		
-ANIMAL KNICKED WHILE SHAVING		1/ 1
1- PRETEST		

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

TABLE RANGE:	11-26-10 TO 12-02-10	
GROUP:		1

NORMAL		
-NO SIGNIFICANT CLINICAL OBSERVATIONS		30/15
SPECIAL II		
-ANIMAL KNICKED WHILE SHAVING		2/ 2

1- PRETEST		
PCSUv4.07 01/07/2011 R:07/18/2012		

----- M A L E -----		
TABLE RANGE:	02-18-11 TO 02-23-11	
GROUP:		1
NORMAL		
-NO SIGNIFICANT CLINICAL OBSERVATIONS		11/ 6
BODY/INTEGUMENT		
-HAIR LOSS FORELIMB(S)		1/ 1
1- PRETEST		

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

TABLE RANGE:	02-18-11 TO 02-23-11	
GROUP:		1

NORMAL		
-NO SIGNIFICANT CLINICAL OBSERVATIONS		10/ 6
EYES/EARS/NOSE		
-CLEAR DISCHARGE LEFT EYE		1/ 1
-CLEAR DISCHARGE RIGHT EYE		1/ 1
-DRIED RED MATERIAL AROUND LEFT EYE		1/ 1

1- PRETEST		
		PCSUv4.07 07/10/2012

APPENDIX C

Animal Room Environmental Conditions

14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL

PROJECT NO.:WIL- 402021

TEMPERATURE/HUMIDITY - STUDY SUMMARY REPORT

SPONSOR: 402 - AMERICAN PETROLEUM

Page 1 of 7

STUDY SPECIFICATIONS: 402021

DATE IN 11/23/10 TIME IN 08:00

DATE OUT 12/17/10 TIME OUT 16:00

ROOM SPECIFICATIONS: B ROOM 71

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

DATE	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
11/23/10	69.5	20.8	69.3	20.7	48.7	48.5
11/24/10	69.7	20.9	69.5	20.8	48.1	47.9
11/25/10	69.4	20.8	69.1	20.6	46.8	46.8
11/26/10	69.5	20.8	69.3	20.7	50.7	50.2
11/27/10	69.7	20.9	69.5	20.8	51.5	51.0
11/28/10	69.4	20.8	69.1	20.6	48.1	47.9
11/29/10	69.5	20.8	69.2	20.7	48.4	48.1
11/30/10	69.2	20.7	68.9	20.5	47.6	47.4
12/01/10	69.3	20.7	69.1	20.6	51.3	50.7
12/02/10	69.3	20.7	69.1	20.6	51.6	51.0
12/03/10	69.3	20.7	69.1	20.6	50.7	50.2
12/04/10	69.4	20.8	69.1	20.6	47.6	47.4
12/05/10	69.1	20.6	68.9	20.5	49.9	49.5
12/06/10	69.3	20.7	69.1	20.6	51.1	50.5
12/07/10	69.2	20.7	68.9	20.5	49.3	48.9
12/08/10	69.1	20.6	68.9	20.5	49.4	49.0
12/09/10	69.1	20.6	68.8	20.4	49.9	49.5
12/10/10	69.5	20.8	69.3	20.7	50.6	50.1
12/11/10	69.3	20.7	69.1	20.6	47.7	47.4

14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL

PROJECT NO.:WIL- 402021

TEMPERATURE/HUMIDITY - STUDY SUMMARY REPORT

SPONSOR: 402 - AMERICAN PETROLEUM

Page 2 of 7

DATE	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
12/12/10	69.3	20.7	69.1	20.6	50.1	49.6
12/13/10	69.3	20.7	69.1	20.6	46.3	46.1
12/14/10	69.0	20.6	68.8	20.4	46.2	46.1
12/15/10	69.2	20.7	69.0	20.6	46.2	46.1
12/16/10	69.3	20.7	69.1	20.6	45.8	45.8
12/17/10	69.4	20.8	69.1	20.6	47.1	46.9

SUMMARY OF DAILY MEANS

	MEAN	MIN	MAX
PRIMARY TEMP °F:	69.3	69.0	69.7
PRIMARY TEMP °C:	20.7	20.6	20.9
SECONDARY TEMP °F:	69.1	68.8	69.5
SECONDARY TEMP °C:	20.6	20.4	20.8
PRIMARY HUM %RH:	48.9	45.8	51.6
SECONDARY HUM %RH:	48.5	45.8	51.0
N DAYS	25		

14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL

PROJECT NO.:WIL- 402021

TEMPERATURE/HUMIDITY - STUDY SUMMARY REPORT

SPONSOR: 402 - AMERICAN PETROLEUM

Page 3 of 7

B ROOM 71 SUMMARY OF HOURLY VALUES

	PRIMARY TEMP				SECONDARY TEMP				PRIMARY HUM		SECONDARY HUM	
MEAN	69.3	°F	20.7	°C	69.1	°F	20.6	°C	48.9	%RH	48.5	%RH
MIN	67.7	°F	19.8	°C	67.5	°F	19.7	°C	36.6	%RH	36.8	%RH
MAX	72.4	°F	22.4	°C	72.2	°F	22.3	°C	62.7	%RH	61.2	%RH
SD	0.65		0.36		0.65		0.36		3.00		2.76	
SE	0.03		0.01		0.03		0.01		0.12		0.11	
N SAMPLES	583				583				583		583	
FIRST DAY	11/23/10											
LAST DAY	12/17/10											
N DAYS	25											

14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL

PROJECT NO.:WIL- 402021

TEMPERATURE/HUMIDITY - STUDY SUMMARY REPORT

SPONSOR: 402 - AMERICAN PETROLEUM

Page 4 of 7

STUDY SPECIFICATIONS: 402021

DATE IN 02/18/11 TIME IN 08:00

DATE OUT 03/10/11 TIME OUT 16:00

ROOM SPECIFICATIONS: B ROOM 100

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

DATE	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
02/18/11	70.2	21.2	70.2	21.2	46.4	47.1
02/19/11	70.2	21.2	70.2	21.2	39.7	40.2
02/20/11	70.3	21.3	70.2	21.2	43.3	43.9
02/21/11	70.4	21.3	70.4	21.3	45.7	46.4
02/22/11	70.3	21.3	70.3	21.3	38.9	39.5
02/23/11	70.3	21.3	70.2	21.2	40.4	41.0
02/24/11	70.4	21.3	70.4	21.3	47.9	48.5
02/25/11	70.4	21.3	70.4	21.3	44.2	44.8
02/26/11	70.3	21.3	70.3	21.3	42.0	42.5
02/27/11	70.5	21.4	70.4	21.3	47.0	47.6
02/28/11	70.4	21.3	70.3	21.3	48.6	49.2
03/01/11	70.5	21.4	70.5	21.4	42.8	43.3
03/02/11	70.4	21.3	70.4	21.3	43.7	44.2
03/03/11	70.4	21.3	70.4	21.3	36.7	37.2
03/04/11	70.4	21.3	70.4	21.3	45.2	45.7
03/05/11	70.4	21.3	70.4	21.3	47.4	47.9
03/06/11	70.4	21.3	70.3	21.3	45.0	45.6
03/07/11	70.5	21.4	70.4	21.3	42.8	43.3
03/08/11	70.4	21.3	70.3	21.3	45.4	46.0

14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL

PROJECT NO.:WIL- 402021

TEMPERATURE/HUMIDITY - STUDY SUMMARY REPORT

SPONSOR: 402 - AMERICAN PETROLEUM

Page 5 of 7

DATE	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
03/09/11	70.5	21.4	70.5	21.4	44.1	44.6
03/10/11	70.4	21.3	70.3	21.3	43.9	44.3

SUMMARY OF DAILY MEANS	MEAN	MIN	MAX
PRIMARY TEMP °F:	70.4	70.2	70.5
PRIMARY TEMP °C:	21.3	21.2	21.4
SECONDARY TEMP °F:	70.3	70.2	70.5
SECONDARY TEMP °C:	21.3	21.2	21.4
PRIMARY HUM %RH:	43.8	36.7	48.6
SECONDARY HUM %RH:	44.4	37.2	49.2
N DAYS	21		

14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL

PROJECT NO.:WIL- 402021

TEMPERATURE/HUMIDITY - STUDY SUMMARY REPORT

SPONSOR: 402 - AMERICAN PETROLEUM

Page 6 of 7

B ROOM 100 SUMMARY OF HOURLY VALUES

	PRIMARY TEMP				SECONDARY TEMP				PRIMARY HUM		SECONDARY HUM	
MEAN	70.4	°F	21.3	°C	70.3	°F	21.3	°C	43.8	%RH	44.4	%RH
MIN	68.7	°F	20.4	°C	68.7	°F	20.4	°C	32.9	%RH	33.6	%RH
MAX	72.5	°F	22.5	°C	72.4	°F	22.4	°C	62.1	%RH	61.1	%RH
SD	0.78		0.43		0.77		0.43		4.50		4.44	
SE	0.04		0.02		0.03		0.02		0.20		0.20	
N SAMPLES	487				487				487		487	
FIRST DAY	02/18/11											
LAST DAY	03/10/11											
N DAYS	21											

14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL

PROJECT NO.:WIL- 402021

TEMPERATURE/HUMIDITY - STUDY SUMMARY REPORT

SPONSOR: 402 - AMERICAN PETROLEUM

Page 7 of 7

STUDY 402021 SUMMARY OF HOURLY VALUES

	PRIMARY TEMP				SECONDARY TEMP				PRIMARY HUM		SECONDARY HUM	
MEAN	69.8	°F	21.0	°C	69.7	°F	20.9	°C	46.6	%RH	46.6	%RH
MIN	67.7	°F	19.8	°C	67.5	°F	19.7	°C	32.9	%RH	33.6	%RH
MAX	72.5	°F	22.5	°C	72.4	°F	22.4	°C	62.7	%RH	61.2	%RH
SD	0.89		0.49		0.94		0.52		4.52		4.17	
SE	0.03		0.01		0.03		0.02		0.14		0.13	
N SAMPLES	1070				1070				1070		1070	
FIRST DAY	11/23/10											
LAST DAY	03/10/11											
N DAYS	46											

NOTE: THE DATE IN AND DATE OUT OF THE STUDY ROOMS MAY OVERLAP.

APPENDIX D

Groups 7-9 Data

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R1 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF SURVIVAL AND DISPOSITION

PAGE 1

GROUP : 7					8					9					MALES				
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE		LIVE	FD	EE	SE						
0	2	0	0	0	2	0	0	0		2	0	0	0						
1	2	0	0	0	2	0	0	0		2	0	0	0						
2	2	0	0	0	2	0	0	0		2	0	0	0						
3	2	0	0	0	2	0	0	0		2	0	0	0						
4	2	0	0	0	2	0	0	0		2	0	0	0						
5	2	0	0	0	2	0	0	0		2	0	0	0						
6	2	0	0	0	2	0	0	0		2	0	0	0						
7	2	0	0	0	2	0	0	0		2	0	0	0						
8	2	0	0	0	2	0	0	0		2	0	0	0						
9	2	0	0	0	2	0	0	0		2	0	0	0						
10	2	0	0	0	2	0	0	0		2	0	0	0						
11	2	0	0	0	2	0	0	0		2	0	0	0						
12	2	0	0	0	2	0	0	0		2	0	0	0						
13	2	0	0	0	2	0	0	0		2	0	0	0						
14	0	0	0	2	0	0	0	2		0	0	0	2						
DAY = DAY OF STUDY					FD = FOUND DEAD					EE = EUTHANIZED IN EXTREMIS					SE = SCHEDULED EUTHANASIA				
7- 450 MG/KG/DAY					8- 600 MG/KG/DAY					9- 750 MG/KG/DAY									

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R1 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF SURVIVAL AND DISPOSITION

PAGE 2

GROUP : 7					8					9					FEMALES				
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE		LIVE	FD	EE	SE						
0	2	0	0	0	2	0	0	0		2	0	0	0						
1	2	0	0	0	2	0	0	0		2	0	0	0						
2	2	0	0	0	2	0	0	0		2	0	0	0						
3	2	0	0	0	2	0	0	0		2	0	0	0						
4	2	0	0	0	2	0	0	0		2	0	0	0						
5	2	0	0	0	2	0	0	0		2	0	0	0						
6	2	0	0	0	2	0	0	0		2	0	0	0						
7	2	0	0	0	2	0	0	0		2	0	0	0						
8	2	0	0	0	2	0	0	0		2	0	0	0						
9	2	0	0	0	2	0	0	0		2	0	0	0						
10	2	0	0	0	2	0	0	0		2	0	0	0						
11	2	0	0	0	2	0	0	0		2	0	0	0						
12	2	0	0	0	2	0	0	0		2	0	0	0						
13	2	0	0	0	2	0	0	0		2	0	0	0						
14	0	0	0	2	0	0	0	2		0	0	0	2						
DAY = DAY OF STUDY					FD = FOUND DEAD					EE = EUTHANIZED IN EXTREMIS					SE = SCHEDULED EUTHANASIA				
7- 450 MG/KG/DAY					8- 600 MG/KG/DAY					9- 750 MG/KG/DAY									

PSURVv4.10
03/23/2011
R:03/24/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 1

	----- M A L E -----		
TABLE RANGE:	DAY 000 TO DAY 014		
GROUP:	7	8	9
NORMAL			
-NO SIGNIFICANT CLINICAL OBSERVATIONS	3/ 2	2/ 2	2/ 2
DISPOSITION			
-PRIMARY NECROPSY (DAY 14)	2/ 2	2/ 2	2/ 2
EYES/EARS/NOSE			
-DRIED YELLOW MATERIAL UROGENITAL AREA	2/ 1	2/ 1	3/ 2
-DRIED RED MATERIAL AROUND NOSE	3/ 2	3/ 2	3/ 2
-DRIED RED MATERIAL AROUND RIGHT EYE	1/ 1	4/ 2	3/ 2
-DRIED RED MATERIAL AROUND LEFT EYE	2/ 2	3/ 2	4/ 2
-DRIED BROWN MATERIAL ANOGENITAL AREA	0/ 0	1/ 1	0/ 0
BODY/INTEG II			
-SCABBING HINDLIMB(S)	0/ 0	1/ 1	0/ 0
SPECIAL			
-SWOLLEN FACIAL AREA	0/ 0	1/ 1	0/ 0
-SWOLLEN LEFT FORELIMB	0/ 0	0/ 0	1/ 1
-SWOLLEN DIGIT(S) LEFT FORELIMB	0/ 0	0/ 0	2/ 1
7- 450 MG/KG/DAY	8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 2

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

TABLE RANGE: GROUP:	7	8	DAY 000 TO DAY 014 9
NORMAL			
-NO SIGNIFICANT CLINICAL OBSERVATIONS	2/ 2	2/ 2	2/ 2
DISPOSITION			
-PRIMARY NECROPSY (DAY 14)	2/ 2	2/ 2	2/ 2
EYES/EARS/NOSE			
-DRIED YELLOW MATERIAL UROGENITAL AREA	2/ 1	0/ 0	4/ 2
-DRIED RED MATERIAL AROUND NOSE	4/ 2	4/ 2	4/ 2
-DRIED RED MATERIAL AROUND RIGHT EYE	2/ 2	2/ 2	2/ 2
-DRIED RED MATERIAL AROUND LEFT EYE	3/ 2	2/ 2	2/ 2
-HAIR LOSS FACIAL AREA	1/ 1	0/ 0	0/ 0
7- 450 MG/KG/DAY	8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PCSUv4.07
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R3 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF POST-DOSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 1

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

TABLE RANGE: DAY 0 TO DAY 13
GROUP: 7 8 9

NORMAL

TIME OF DOSE
-NO SIGNIFICANT CLINICAL 28/2 27/2 22/2
OBSERVATIONS

1-2 HOUR POST-DOSING
-NO SIGNIFICANT CLINICAL 26/2 28/2 22/2
OBSERVATIONS

SPECIAL

TIME OF DOSE
-SWOLLEN FACIAL AREA 0/0 1/1 0/0
-SWOLLEN LEFT FORELIMB 0/0 0/0 3/1
-SWOLLEN DIGIT(S) LEFT 0/0 0/0 6/1
FORELIMB

1-2 HOUR POST-DOSING
-SWOLLEN FACIAL AREA 2/1 0/0 0/0
-SWOLLEN LEFT FORELIMB 0/0 0/0 3/1
-SWOLLEN DIGIT(S) LEFT 0/0 0/0 6/1
FORELIMB

7- 450 MG/KG/DAY 8- 600 MG/KG/DAY 9- 750 MG/KG/DAY

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R3 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF POST-DOSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 2

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

TABLE RANGE: DAY 0 TO DAY 13
GROUP: 7 8 9

NORMAL

TIME OF DOSE
-NO SIGNIFICANT CLINICAL 28/2 28/2 28/2
OBSERVATIONS

1-2 HOUR POST-DOSING
-NO SIGNIFICANT CLINICAL 28/2 28/2 28/2
OBSERVATIONS

7- 450 MG/KG/DAY 8- 600 MG/KG/DAY 9- 750 MG/KG/DAY

PPDTSUv1.48
03/23/2011
R:03/24/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R4 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF DERMAL OBSERVATIONS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 1

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

TABLE RANGE:	DAY 000 TO DAY 014		
GROUP:	7	8	9

DERMAL OBS			
-SCORED, NOT REMARKABLE	6/ 2	4/ 2	5/ 2
-NO ERYTHEMA	24/ 2	13/ 2	7/ 2
-ERYTHEMA - VERY SLIGHT	0/ 0	13/ 2	9/ 2
-ERYTHEMA - SLIGHT	0/ 0	0/ 0	9/ 1
-NO EDEMA	24/ 2	26/ 2	23/ 2
-EDEMA - VERY SLIGHT	0/ 0	0/ 0	2/ 2
-DESQUAMATION	0/ 0	1/ 1	6/ 1
-RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE	24/ 2	24/ 2	19/ 2

7- 450 MG/KG/DAY	8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R4 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF DERMAL OBSERVATIONS: TOTAL OCCURRENCE/NO. OF ANIMALS

PAGE 2

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

TABLE RANGE:	DAY 000 TO DAY 014		
GROUP:	7	8	9
DERMAL OBS			
-SCORED, NOT REMARKABLE	4/ 2	2/ 2	2/ 2
-NO ERYTHEMA	26/ 2	12/ 2	6/ 2
-ERYTHEMA - VERY SLIGHT	0/ 0	6/ 2	6/ 2
-ERYTHEMA - SLIGHT	0/ 0	10/ 2	11/ 2
-ERYTHEMA - MODERATE	0/ 0	0/ 0	5/ 1
-NO EDEMA	26/ 2	28/ 2	20/ 2
-EDEMA - VERY SLIGHT	0/ 0	0/ 0	8/ 2
-DESQUAMATION	0/ 0	0/ 0	17/ 2
-RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE	26/ 2	21/ 2	14/ 2

7- 450 MG/KG/DAY 8- 600 MG/KG/DAY 9- 750 MG/KG/DAY

PCSUv4.07
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R5 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHTS [G]

PAGE 1

		MALES			
GROUP:		7	8	9	
DAY	-6	MEAN	400.	415.	427.
		S.D.	69.3	13.4	21.2
		N	2	2	2
	-1	MEAN	429.	442.	437.
		S.D.	72.8	18.4	33.9
		N	2	2	2
	0	MEAN	404.	419.	417.
		S.D.	69.3	14.8	42.4
		N	2	2	2
	7	MEAN	393.	408.	401.
		S.D.	67.2	12.7	33.9
		N	2	2	2
	13	MEAN	399.	417.	401.
		S.D.	78.5	8.5	25.5
		N	2	2	2
7- 450	MG/KG/DAY	8- 600	MG/KG/DAY	9- 750	MG/KG/DAY

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R5 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHTS [G]

PAGE 2

		FEMALES		
GROUP:		7	8	9
DAY	-6			
	MEAN	238.	277.	291.
	S.D.	11.3	28.3	73.5
	N	2	2	2
	-1			
	MEAN	250.	284.	296.
	S.D.	23.3	32.5	75.0
	N	2	2	2
	0			
	MEAN	244.	276.	280.
	S.D.	19.8	26.2	65.8
	N	2	2	2
	7			
	MEAN	249.	269.	275.
	S.D.	19.1	31.1	52.3
	N	2	2	2
	13			
	MEAN	264.	273.	276.
	S.D.	1.4	35.4	45.3
	N	2	2	2
7- 450 MG/KG/DAY		8- 600 MG/KG/DAY		9- 750 MG/KG/DAY

PBFSTv5.34
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R6 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHT CHANGES [G]

PAGE 1

				MALES		
GROUP:				7	8	9
DAY	-6 TO	-1				
		MEAN		29.	28.	10.
		S.D.		3.5	4.9	12.7
		N		2	2	2
	-1 TO	0				
		MEAN		-25.	-24.	-20.
		S.D.		3.5	3.5	8.5
		N		2	2	2
	0 TO	7				
		MEAN		-12.	-11.	-16.
		S.D.		2.1	2.1	8.5
		N		2	2	2
	7 TO	13				
		MEAN		6.	9.	0.
		S.D.		11.3	4.2	8.5
		N		2	2	2
7- 450 MG/KG/DAY				8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R6 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF BODY WEIGHT CHANGES [G]

PAGE 2

				FEMALES		
GROUP:				7	8	9
DAY	-6 TO	-1				
		MEAN		12.	7.	5.
		S.D.		12.0	4.2	1.4
		N		2	2	2
	-1 TO	0				
		MEAN		-6.	-9.	-17.
		S.D.		3.5	6.4	9.2
		N		2	2	2
	0 TO	7				
		MEAN		5.	-7.	-5.
		S.D.		0.7	4.9	13.4
		N		2	2	2
	7 TO	13				
		MEAN		16.	4.	1.
		S.D.		17.7	4.2	7.1
		N		2	2	2
7- 450 MG/KG/DAY				8- 600 MG/KG/DAY		
				9- 750 MG/KG/DAY		

PBFSTv5.34
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R7 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

					MALES		
GROUP:		7	8	9			
DAY	0 TO	7					
		MEAN	-12.	-11.	-16.		
		S.D.	2.1	2.1	8.5		
		N	2	2	2		
	0 TO	13					
		MEAN	-6.	-2.	-16.		
		S.D.	9.2	6.4	17.0		
		N	2	2	2		
7-	450 MG/KG/DAY	8-	600 MG/KG/DAY	9-	750 MG/KG/DAY		

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R7 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

				FEMALES
GROUP:		7	8	9
DAY	0 TO 7			
	MEAN	5.	-7.	-5.
	S.D.	0.7	4.9	13.4
	N	2	2	2
	0 TO 13			
	MEAN	20.	-3.	-4.
	S.D.	18.4	9.2	20.5
	N	2	2	2
7- 450 MG/KG/DAY		8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PBFSTv5.34
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R8 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF FOOD CONSUMPTION [G/ANIMAL/DAY]

				MALES		
GROUP:				7	8	9
DAY	-6 TO	-1				
		MEAN	33.	31.	28.	
		S.D.	4.9	1.4	5.7	
		N	2	2	2	
	0 TO	7				
		MEAN	23.	24.	22.	
		S.D.	2.8	2.1	1.4	
		N	2	2	2	
	7 TO	13				
		MEAN	32.	34.	31.	
		S.D.	0.0	1.4	0.7	
		N	1	2	2	
7- 450 MG/KG/DAY				8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R8 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF FOOD CONSUMPTION [G/ANIMAL/DAY]

PAGE 2

				FEMALES		
GROUP:				7	8	9
DAY	-6	TO	-1			
			MEAN	22.	23.	20.
			S.D.	2.8	3.5	1.4
			N	2	2	2
	0	TO	7			
			MEAN	20.	20.	18.
			S.D.	1.4	5.7	4.2
			N	2	2	2
	7	TO	13			
			MEAN	31.	28.	25.
			S.D.	0.0	1.4	5.7
			N	1	2	2
7- 450 MG/KG/DAY				8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PBFSTv5.34
03/23/2011
R:03/23/2011

TABLE R9 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

Page 130 of 371

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R9 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF MACROSCOPIC FINDINGS

PAGE 2

SCHEDULED NECROPSY

	----- F E M A L E -----		
GROUP:	7	8	9
NUMBER OF ANIMALS IN DOSE GROUP	2	2	2
NUMBER OF ANIMALS EXAMINED DAY 14	2	2	2
STOMACH			
-AREA(S), DARK RED	0	0	1
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	2	2	1
7- 450 MG/KG/DAY	8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PGRSI2v4.09
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R10 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

PAGE 1

	MALES		
GROUP:	7	8	9

FINAL BODY WT (G)			
MEAN	369.	384.	376.
S.D.	72.1	14.1	27.6
N	2	2	2
LIVER (G)			
MEAN	15.24	16.21	16.44
S.D.	2.390	1.775	2.376
N	2	2	2
LIVER (G/100 G FINAL BODY WEIGHT)			
MEAN	4.146	4.231	4.367
S.D.	0.1626	0.6180	0.3118
N	2	2	2

7- 450 MG/KG/DAY	8- 600 MG/KG/DAY	9- 750 MG/KG/DAY	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R10 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

PAGE 2

FEMALES				
GROUP:	7	8	9	

FINAL BODY WT (G)				
MEAN	236.	249.	249.	
S.D.	0.7	30.4	53.7	
N	2	2	2	
LIVER (G)				
MEAN	10.54	10.76	10.14	
S.D.	0.325	0.318	2.694	
N	2	2	2	
LIVER (G/100 G FINAL BODY WEIGHT)				
MEAN	4.476	4.353	4.048	
S.D.	0.1252	0.4045	0.2086	
N	2	2	2	

7- 450 MG/KG/DAY	8- 600 MG/KG/DAY	9- 750 MG/KG/DAY		

POFBSTv5.25
03/24/2011
R:07/18/2012

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R11 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL SURVIVAL AND DISPOSITION

PAGE 1

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	STUDY DAY
5656	M	450 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
5668	M	450 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
5670	M	600 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
5678	M	600 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
4469	M	750 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
4470	M	750 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (15)

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R11 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL SURVIVAL AND DISPOSITION

PAGE 2

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	STUDY DAY
3832	F	450 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
4234	F	450 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
3828	F	600 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
3831	F	600 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
4240	F	750 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14
4244	F	750 MG/KG/DAY	SCHEDULED EUTHANASIA	17	10-MAR-11	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (15)

PDEADv4.07
03/31/2011
R:07/13/2012

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R12 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 1

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
5656	M	450 MG/KG/DAY	NORMAL	0	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5656	M	450 MG/KG/DAY	DISPOSITION	14	9:55	P	PRIMARY NECROPSY (DAY 14)
5656	M	450 MG/KG/DAY	EYES/EARS/NOSE	7	9:06	P	DRIED RED MATERIAL AROUND NOSE
				7	9:06	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:06	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	9:06	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				14	7:44	P	DRIED RED MATERIAL AROUND NOSE
				14	7:44	P	DRIED YELLOW MATERIAL UROGENITAL AREA
5668	M	450 MG/KG/DAY	NORMAL	0	8:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5668	M	450 MG/KG/DAY	DISPOSITION	14	9:55	P	PRIMARY NECROPSY (DAY 14)
5668	M	450 MG/KG/DAY	EYES/EARS/NOSE	7	9:07	P	DRIED RED MATERIAL AROUND NOSE
				7	9:07	P	DRIED RED MATERIAL AROUND LEFT EYE
5670	M	600 MG/KG/DAY	NORMAL	0	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5670	M	600 MG/KG/DAY	DISPOSITION	14	9:56	P	PRIMARY NECROPSY (DAY 14)
5670	M	600 MG/KG/DAY	EYES/EARS/NOSE	7	9:12	P	DRIED RED MATERIAL AROUND NOSE
				7	9:12	P	DRIED RED MATERIAL AROUND RIGHT EYE
				14	7:46	P	DRIED RED MATERIAL AROUND RIGHT EYE
				14	7:46	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:47	P	DRIED BROWN MATERIAL ANOGENITAL AREA
5670	M	600 MG/KG/DAY	BODY/INTEG II	14	7:48	P	SCABBING HINDLIMB(S)
5670	M	600 MG/KG/DAY	SPECIAL	14	7:48	P	SWOLLEN FACIAL AREA
5678	M	600 MG/KG/DAY	NORMAL	0	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5678	M	600 MG/KG/DAY	DISPOSITION	14	9:56	P	PRIMARY NECROPSY (DAY 14)
5678	M	600 MG/KG/DAY	EYES/EARS/NOSE	7	9:13	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				7	9:13	P	DRIED RED MATERIAL AROUND NOSE
				7	9:13	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:13	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:48	P	DRIED YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R12 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 2

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
5678	M	600 MG/KG/DAY	EYES/EARS/NOSE	14	7:48	P	DRIED RED MATERIAL AROUND NOSE
				14	7:48	P	DRIED RED MATERIAL AROUND RIGHT EYE
				14	7:49	P	DRIED RED MATERIAL AROUND LEFT EYE
4469	M	750 MG/KG/DAY	NORMAL	0	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4469	M	750 MG/KG/DAY	DISPOSITION	14	9:57	P	PRIMARY NECROPSY (DAY 14)
4469	M	750 MG/KG/DAY	EYES/EARS/NOSE	7	9:17	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				7	9:17	P	DRIED RED MATERIAL AROUND NOSE
				7	9:17	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:17	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:50	P	DRIED RED MATERIAL AROUND NOSE
				14	7:50	P	DRIED RED MATERIAL AROUND LEFT EYE
4470	M	750 MG/KG/DAY	NORMAL	0	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4470	M	750 MG/KG/DAY	DISPOSITION	14	9:57	P	PRIMARY NECROPSY (DAY 14)
4470	M	750 MG/KG/DAY	EYES/EARS/NOSE	7	9:27	P	DRIED RED MATERIAL AROUND NOSE
				7	9:27	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:27	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	9:27	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				14	7:51	P	DRIED RED MATERIAL AROUND RIGHT EYE
				14	7:51	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:51	P	DRIED YELLOW MATERIAL UROGENITAL AREA
4470	M	750 MG/KG/DAY	SPECIAL	7	9:27	P	SWOLLEN LEFT FORELIMB
				7	9:37	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				14	7:51	P	SWOLLEN DIGIT(S) LEFT FORELIMB
3832	F	450 MG/KG/DAY	NORMAL	0	8:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
3832	F	450 MG/KG/DAY	DISPOSITION	14	9:56	P	PRIMARY NECROPSY (DAY 14)
3832	F	450 MG/KG/DAY	EYES/EARS/NOSE	7	9:09	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				7	9:09	P	DRIED RED MATERIAL AROUND NOSE
				7	9:09	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:09	P	DRIED RED MATERIAL AROUND LEFT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R12 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 3

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
3832	F	450 MG/KG/DAY	EYES/EARS/NOSE	14	7:44	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				14	7:44	P	DRIED RED MATERIAL AROUND NOSE
				14	7:45	P	HAIR LOSS FACIAL AREA
4234	F	450 MG/KG/DAY	NORMAL	0	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4234	F	450 MG/KG/DAY	DISPOSITION	14	9:56	P	PRIMARY NECROPSY (DAY 14)
4234	F	450 MG/KG/DAY	EYES/EARS/NOSE	7	9:10	P	DRIED RED MATERIAL AROUND NOSE
				7	9:10	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:10	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:45	P	DRIED RED MATERIAL AROUND NOSE
				14	7:45	P	DRIED RED MATERIAL AROUND LEFT EYE
3828	F	600 MG/KG/DAY	NORMAL	0	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
3828	F	600 MG/KG/DAY	DISPOSITION	14	9:56	P	PRIMARY NECROPSY (DAY 14)
3828	F	600 MG/KG/DAY	EYES/EARS/NOSE	7	9:14	P	DRIED RED MATERIAL AROUND NOSE
				7	9:14	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:14	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:49	P	DRIED RED MATERIAL AROUND NOSE
3831	F	600 MG/KG/DAY	NORMAL	0	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
3831	F	600 MG/KG/DAY	DISPOSITION	14	9:56	P	PRIMARY NECROPSY (DAY 14)
3831	F	600 MG/KG/DAY	EYES/EARS/NOSE	7	9:16	P	DRIED RED MATERIAL AROUND NOSE
				7	9:16	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:16	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:50	P	DRIED RED MATERIAL AROUND NOSE
4240	F	750 MG/KG/DAY	NORMAL	0	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4240	F	750 MG/KG/DAY	DISPOSITION	14	9:57	P	PRIMARY NECROPSY (DAY 14)
4240	F	750 MG/KG/DAY	EYES/EARS/NOSE	7	9:28	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				7	9:28	P	DRIED RED MATERIAL AROUND NOSE
				7	9:28	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:28	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:52	P	DRIED YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R12 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 4

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
4240	F	750 MG/KG/DAY	EYES/EARS/NOSE	14	7:52	P	DRIED RED MATERIAL AROUND NOSE
4244	F	750 MG/KG/DAY	NORMAL	0	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4244	F	750 MG/KG/DAY	DISPOSITION	14	9:57	P	PRIMARY NECROPSY (DAY 14)
4244	F	750 MG/KG/DAY	EYES/EARS/NOSE	7	9:30	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				7	9:30	P	DRIED RED MATERIAL AROUND NOSE
				7	9:30	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	9:30	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	7:52	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				14	7:52	P	DRIED RED MATERIAL AROUND NOSE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.17
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R13 (AT TIME OF DOSING - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 1

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
5656	M	450 MG/KG/DAY	NORMAL	0	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5668	M	450 MG/KG/DAY	NORMAL	0	11:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5670	M	600 MG/KG/DAY	NORMAL	0	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R13 (AT TIME OF DOSING - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 2

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
5670	M	600 MG/KG/DAY	NORMAL	1	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5678	M	600 MG/KG/DAY	NORMAL	0	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5678	M	600 MG/KG/DAY	SPECIAL	12	9:36	P	SWOLLEN FACIAL AREA
4469	M	750 MG/KG/DAY	NORMAL	0	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R13 (AT TIME OF DOSING - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 3

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
4469	M	750 MG/KG/DAY	NORMAL	2	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4470	M	750 MG/KG/DAY	NORMAL	0	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4470	M	750 MG/KG/DAY	SPECIAL	7	12:22	P	SWOLLEN LEFT FORELIMB
				7	12:22	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				8	10:43	P	SWOLLEN LEFT FORELIMB
				8	10:43	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				10	8:57	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				11	10:16	P	SWOLLEN LEFT FORELIMB
				11	10:16	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				12	9:39	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				13	10:51	P	SWOLLEN DIGIT(S) LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R13 (AT TIME OF DOSING - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 4

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
3832	F	450 MG/KG/DAY	NORMAL	0	11:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4234	F	450 MG/KG/DAY	NORMAL	0	11:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
3828	F	600 MG/KG/DAY	NORMAL	0	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R13 (AT TIME OF DOSING - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 5

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
3828	F	600 MG/KG/DAY	NORMAL	1	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
3831	F	600 MG/KG/DAY	NORMAL	0	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4240	F	750 MG/KG/DAY	NORMAL	0	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R13 (AT TIME OF DOSING - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 6

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
4240	F	750 MG/KG/DAY	NORMAL	2	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4244	F	750 MG/KG/DAY	NORMAL	0	12:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	10:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.17
03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R14 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 1

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
5656	M	450 MG/KG/DAY	NORMAL	0	13:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5668	M	450 MG/KG/DAY	NORMAL	0	13:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5668	M	450 MG/KG/DAY	SPECIAL	2	12:27	P	SWOLLEN FACIAL AREA
				3	11:13	P	SWOLLEN FACIAL AREA
5670	M	600 MG/KG/DAY	NORMAL	0	13:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R14 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 2

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
5670	M	600 MG/KG/DAY	NORMAL	1	12:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
5678	M	600 MG/KG/DAY	NORMAL	0	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4469	M	750 MG/KG/DAY	NORMAL	0	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R14 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 3

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
4469	M	750 MG/KG/DAY	NORMAL	2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4470	M	750 MG/KG/DAY	NORMAL	0	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4470	M	750 MG/KG/DAY	SPECIAL	7	13:38	P	SWOLLEN LEFT FORELIMB
				7	13:38	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				8	12:01	P	SWOLLEN LEFT FORELIMB
				8	12:01	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				10	10:07	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				11	11:22	P	SWOLLEN LEFT FORELIMB
				11	11:22	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				12	10:54	P	SWOLLEN DIGIT(S) LEFT FORELIMB
				13	11:53	P	SWOLLEN DIGIT(S) LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R14 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 4

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
3832	F	450 MG/KG/DAY	NORMAL	0	13:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4234	F	450 MG/KG/DAY	NORMAL	0	13:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
3828	F	600 MG/KG/DAY	NORMAL	0	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R14 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 5

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
3828	F	600 MG/KG/DAY	NORMAL	1	12:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
3831	F	600 MG/KG/DAY	NORMAL	0	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4240	F	750 MG/KG/DAY	NORMAL	0	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R14 (DOSING DAY OBSERVATIONS - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 6

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
4240	F	750 MG/KG/DAY	NORMAL	2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
4244	F	750 MG/KG/DAY	NORMAL	0	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	13:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	12:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.17
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R	TABLE R15 (GROUPS 7-9)	PAGE 1
SPONSOR:AMERICAN PETROLEUM	14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL	
	INDIVIDUAL DERMAL OBSERVATIONS	

GROUP :	450 MG/KG/DAY	ANIMAL NO. / SEX	
	5656/M	5668/M	
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS		
0	SNR	SNR	
1	0/0/h	0/0/h	
2	0/0/h	0/0/h	
3	0/0/h	0/0/h	
4	0/0/h	0/0/h	
5	0/0/h	0/0/h	
6	0/0/h	0/0/h	
7	0/0/h	0/0/h	
8	0/0/h	0/0/h	
9	0/0/h	0/0/h	
10	0/0/h	0/0/h	
11	0/0/h	SNR	
12	0/0/h	SNR	
13	0/0/h	0/0/h	
14	SNR	SNR	

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
 SEX CODE: M = MALE F = FEMALE
 SNR = SCORED, NOT REMARKABLE
 h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

PROJECT NO.:WIL-402021R	TABLE R15 (GROUPS 7-9)	PAGE 2
SPONSOR:AMERICAN PETROLEUM	14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL	
	INDIVIDUAL DERMAL OBSERVATIONS	

GROUP :	600 MG/KG/DAY		ANIMAL NO. / SEX
	5670/M	5678/M	
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS		
0	SNR	SNR	
1	0/0/h	0/0/h	
2	0/0/h	0/0/h	
3	0/0/h	0/0/h	
4	1/0/h	1/0/h	
5	1/0/h	1/0/h	
6	1/0/h	0/0/h	
7	1/0/h	1/0/h	
8	1/0/h	1/0/h	
9	1/0/hd	1/0/h	
10	0/0/h	0/0/h	
11	1/0	0/0/h	
12	SNR	0/0/h	
13	0/0/h	0/0/h	
14	SNR	1/0	

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
 SEX CODE: M = MALE F = FEMALE
 d = DESQUAMATION, SNR = SCORED, NOT REMARKABLE
 h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R15 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 3

GROUP : 750 MG/KG/DAY		ANIMAL NO. / SEX	
4469/M		4470/M	
STUDY DAY		ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR	
1	0/0/h	0/0/h	
2	0/0/h	0/0/h	
3	0/0/h	0/0/h	
4	1/0/h	1/0/h	
5	1/0/h	2/0/h	
6	1/0/h	2/0/h	
7	1/0/h	2/0/h	
8	1/1/h	2/0/h	
9	1/0/h	2/1/d	
10	0/0/h	2/0/dh	
11	SNR	2/0/d	
12	SNR	2/0/d	
13	1/0	2/0/d	
14	SNR	1/0/d	
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA			
SEX CODE: M = MALE F = FEMALE			
d = DESQUAMATION, SNR = SCORED, NOT REMARKABLE			
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE			

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R15 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 4

GROUP : 450 MG/KG/DAY		ANIMAL NO. / SEX	
3832/F		4234/F	
STUDY DAY		ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR	
1	0/0/h	0/0/h	
2	0/0/h	0/0/h	
3	0/0/h	0/0/h	
4	0/0/h	0/0/h	
5	0/0/h	0/0/h	
6	0/0/h	0/0/h	
7	0/0/h	0/0/h	
8	0/0/h	0/0/h	
9	0/0/h	0/0/h	
10	0/0/h	0/0/h	
11	0/0/h	0/0/h	
12	0/0/h	0/0/h	
13	0/0/h	0/0/h	
14	SNR	SNR	
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA			
SEX CODE: M = MALE F = FEMALE			
d = DESQUAMATION, SNR = SCORED, NOT REMARKABLE			
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE			

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R15 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 5

GROUP : 600 MG/KG/DAY			ANIMAL NO. / SEX		
3828/F			3831/F		
STUDY DAY			ERYTHEMA+/EDEMA+/OTHER FINDINGS		
0	SNR	SNR			
1	0/0/h	0/0/h			
2	0/0/h	0/0/h			
3	0/0/h	0/0/h			
4	0/0/h	0/0/h			
5	0/0/h	0/0/h			
6	1/0/h	0/0/h			
7	2/0/h	1/0/h			
8	2/0/h	1/0/h			
9	2/0/h	0/0/h			
10	2/0/h	2/0/h			
11	2/0	2/0/h			
12	1/0	2/0			
13	1/0	2/0			
14	1/0	2/0			
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA					
SEX CODE: M = MALE F = FEMALE					
d = DESQUAMATION, SNR = SCORED, NOT REMARKABLE					
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE					

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R15 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 6

GROUP : 750 MG/KG/DAY		ANIMAL NO. / SEX
4240/F		4244/F
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	0/0/h	0/0/h
2	0/0/h	0/0/h
3	0/0/h	0/0/h
4	1/0/h	2/0/h
5	2/1/h	3/0/h
6	2/0/h	3/0/dh
7	2/1/d	3/1/d
8	2/0/dh	3/1/d
9	2/1/d	3/1/d
10	1/1/dh	1/1/d
11	1/0/d	1/0/d
12	2/0/d	2/0/d
13	2/0/d	2/0/d
14	1/0/d	2/0/d
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA		
SEX CODE: M = MALE F = FEMALE		
d = DESQUAMATION, SNR = SCORED, NOT REMARKABLE		
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE		

PIDERV3.13
03/23/2011

DAY	-6	-1	0	7	MALE GROUP: 450 MG/KG/DAY 13
ANIMAL					
5656	351.	377.	355.	345.	343.
5668	449.	480.	453.	440.	454.
MEAN	400.	429.	404.	393.	399.
S.D.	69.3	72.8	69.3	67.2	78.5
N	2	2	2	2	2

DAY	-6	-1	0	7	MALE GROUP: 600 MG/KG/DAY 13
ANIMAL					
5670	405.	429.	408.	399.	411.
5678	424.	455.	429.	417.	423.
MEAN	415.	442.	419.	408.	417.
S.D.	13.4	18.4	14.8	12.7	8.5
N	2	2	2	2	2

DAY	-6	-1	0	7	MALE GROUP: 750 MG/KG/DAY 13
ANIMAL					
4469	442.	461.	447.	425.	419.
4470	412.	413.	387.	377.	383.
MEAN	427.	437.	417.	401.	401.
S.D.	21.2	33.9	42.4	33.9	25.5
N	2	2	2	2	2

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R16 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-6	-1	0	7	13
FEMALE GROUP: 450 MG/KG/DAY					
ANIMAL					
3832	246.	266.	258.	262.	265.
4234	230.	233.	230.	235.	263.
MEAN	238.	250.	244.	249.	264.
S.D.	11.3	23.3	19.8	19.1	1.4
N	2	2	2	2	2

DAY	-6	-1	0	7	13
FEMALE GROUP: 600 MG/KG/DAY					
ANIMAL					
3828	297.	307.	294.	291.	298.
3831	257.	261.	257.	247.	248.
MEAN	277.	284.	276.	269.	273.
S.D.	28.3	32.5	26.2	31.1	35.4
N	2	2	2	2	2

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R16 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-6	-1	0	7	13
FEMALE GROUP: 750 MG/KG/DAY					
ANIMAL					
4240	343.	349.	326.	312.	308.
4244	239.	243.	233.	238.	244.
MEAN	291.	296.	280.	275.	276.
S.D.	73.5	75.0	65.8	52.3	45.3
N	2	2	2	2	2

PBFTSv4.49
03/23/2011
R:03/23/2011

MALE GROUP: 450 MG/KG/DAY							
DAY	-6 TO	-1	-1 TO	0	0 TO	7	7 TO 13

ANIMAL							
5656	26.		-22.		-10.		-2.
5668	31.		-27.		-13.		14.
MEAN	29.		-25.		-12.		6.
S.D.	3.5		3.5		2.1		11.3
N	2		2		2		2

MALE GROUP: 600 MG/KG/DAY							
DAY	-6 TO	-1	-1 TO	0	0 TO	7	7 TO 13

ANIMAL							
5670		24.		-21.		-9.	12.
5678		31.		-26.		-12.	6.
MEAN		28.		-24.		-11.	9.
S.D.		4.9		3.5		2.1	4.2
N		2		2		2	2

MALE GROUP: 750 MG/KG/DAY								
DAY	-6 TO	-1	-1 TO	0	0 TO	7	7 TO	13

ANIMAL								
4469		19.		-14.		-22.		-6.
4470		1.		-26.		-10.		6.
MEAN		10.		-20.		-16.		0.
S.D.		12.7		8.5		8.5		8.5
N		2		2		2		2

FEMALE GROUP: 450 MG/KG/DAY								
DAY	-6 TO	-1	-1 TO	0	0 TO	7	7 TO	13

ANIMAL								
3832		20.		-8.		4.		3.
4234		3.		-3.		5.		28.
MEAN		12.		-6.		5.		16.
S.D.		12.0		3.5		0.7		17.7
N		2		2		2		2

FEMALE GROUP: 600 MG/KG/DAY									
DAY	-6 TO	-1	-1 TO	0	0 TO	7	7 TO	13	

ANIMAL									
3828		10.		-13.		-3.		7.	
3831		4.		-4.		-10.		1.	
MEAN		7.		-9.		-7.		4.	
S.D.		4.2		6.4		4.9		4.2	
N		2		2		2		2	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R17 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALE GROUP: 750 MG/KG/DAY								
DAY	-6 TO	-1	-1 TO	0	0 TO	7	7 TO	13

ANIMAL								
4240		6.		-23.		-14.		-4.
4244		4.		-10.		5.		6.
MEAN		5.		-17.		-5.		1.
S.D.		1.4		9.2		13.4		7.1
N		2		2		2		2

PBFTSv4.49
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R18 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 1

MALE GROUP: 450 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
5656	-10.	-12.	
5668	-13.	1.	
MEAN	-12.	-6.	
S.D.	2.1	9.2	
N	2	2	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R18 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 2

MALE GROUP: 600 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
5670	-9.	3.	
5678	-12.	-6.	
MEAN	-11.	-2.	
S.D.	2.1	6.4	
N	2	2	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R18 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

DAY	0 TO 7	0 TO 13

ANIMAL		
4469	-22.	-28.
4470	-10.	-4.
MEAN	-16.	-16.
S.D.	8.5	17.0
N	2	2

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R18 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: 450 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
3832	4.	7.	
4234	5.	33.	
MEAN	5.	20.	
S.D.	0.7	18.4	
N	2	2	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R18 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: 600 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
3828	-3.	4.	
3831	-10.	-9.	
MEAN	-7.	-3.	
S.D.	4.9	9.2	
N	2	2	

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R18 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 6

FEMALE GROUP: 750 MG/KG/DAY

DAY	0 TO 7	0 TO 13

ANIMAL		
4240	-14.	-18.
4244	5.	11.
MEAN	-5.	-4.
S.D.	13.4	20.5
N	2	2

PBFTSv4.49
03/23/2011
R:03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R19 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALE GROUP: 450 MG/KG/DAY				
DAY	-6 TO -1	0 TO 7	7 TO 13	

ANIMAL				
5656	29.	25.	32.	
5668	36.	21.	NA	
MEAN	33.	23.	32.	
S.D.	4.9	2.8	0.0	
N	2	2	1	

NA = NOT APPLICABLE

MALE GROUP: 600 MG/KG/DAY						
DAY	-6 TO	-1	0 TO	7	7 TO	13

ANIMAL						
5670		32.		22.		35.
5678		30.		25.		33.
MEAN		31.		24.		34.
S.D.		1.4		2.1		1.4
N		2		2		2

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R19 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALE GROUP: 750 MG/KG/DAY						
DAY	-6 TO	-1	0 TO	7	7 TO	13

ANIMAL						
4469		32.		23.		30.
4470		24.		21.		31.
MEAN		28.		22.		31.
S.D.		5.7		1.4		0.7
N		2		2		2

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R19 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: 450 MG/KG/DAY				
DAY	-6 TO -1	0 TO 7	7 TO 13	

ANIMAL				
3832	24.	21.	31.	
4234	20.	19.	NA	
MEAN	22.	20.	31.	
S.D.	2.8	1.4	0.0	
N	2	2	1	

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R19 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: 600 MG/KG/DAY						
DAY	-6 TO	-1	0 TO	7	7 TO	13
ANIMAL						
3828		25.		24.		29.
3831		20.		16.		27.
MEAN		23.		20.		28.
S.D.		3.5		5.7		1.4
N		2		2		2

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R19 (GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: 750 MG/KG/DAY						
DAY	-6 TO	-1	0 TO	7	7 TO	13

ANIMAL						
4240		21.		15.		21.
4244		19.		21.		29.
MEAN		20.		18.		25.
S.D.		1.4		4.2		5.7
N		2		2		2

PBFTSv4.49
03/23/2011
R:03/23/2011

ANIMAL NO.5656 GROUP 7: 450 MG/KG/DAY MALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	13.55	4.261	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	EPIDIDYMITES	ESOPHAGUS
FINAL BODY WT(G)	318.			EYES	HEART	INTESTINE	KIDNEYS
				LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
				PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
				TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
				SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO.5668GROUP7: 450 MG/KG/DAYMALESCHEDULED EUTH03/10/11DATE OF DEATH: 03/10/11STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	16.93	4.031	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	EPIDIDYIMIDES	ESOPHAGUS
FINAL BODY WT(G)	420.			EYES	HEART	INTESTINE	KIDNEYS
				LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
				PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
				TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
				SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 3

ANIMAL NO. 5670 GROUP 8: 600 MG/KG/DAY MALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	17.46	4.668	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	EPIDIDYIMIDES	ESOPHAGUS
FINAL BODY WT(G)	374.			EYES	HEART	INTESTINE	KIDNEYS
				LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
				PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
				TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
				SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 4

ANIMAL NO. 5678 GROUP 8: 600 MG/KG/DAY MALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	14.95	3.794	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	EPIDIDYIMIDES	ESOPHAGUS
FINAL BODY WT(G)	394.			EYES	HEART	INTESTINE	KIDNEYS
				LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
				PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
				TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
				SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 5

ANIMAL NO. 4469 GROUP 9: 750 MG/KG/DAY MALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	18.12	4.587	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	EPIDIDYMITES	ESOPHAGUS
FINAL BODY WT(G)	395.			EYES	HEART	INTESTINE	KIDNEYS
				LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
				PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
				TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
				SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 6

ANIMAL NO. 4470 GROUP 9: 750 MG/KG/DAY MALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	14.76	4.146	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	EPIDIDYIMIDES	ESOPHAGUS
FINAL BODY WT(G)	356.			EYES	HEART	INTESTINE	KIDNEYS
				LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND
				PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
				TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
				SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 7

ANIMAL NO. 3832 GROUP 7: 450 MG/KG/DAY FEMALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	10.31	4.387	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
FINAL BODY WT(G)	235.			HEART	INTESTINE	KIDNEYS	LIVER
				LN, MESENTERIC	LUNGS	MAMMARY GLAND	OVIDUCTS
				OVARIES	PANCREAS	PITUITARY	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
				UTERUS	CERVIX	VAGINA	LN, AXILLARY
				SKIN, TREATED	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 8

ANIMAL NO. 4234 GROUP 7: 450 MG/KG/DAY FEMALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	10.77	4.564	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
FINAL BODY WT(G)	236.			HEART	INTESTINE	KIDNEYS	LIVER
				LN, MESENTERIC	LUNGS	MAMMARY GLAND	OVIDUCTS
				OVARIES	PANCREAS	PITUITARY	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
				UTERUS	CERVIX	VAGINA	LN, AXILLARY
				SKIN, TREATED	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 9

ANIMAL NO. 3828 GROUP 8: 600 MG/KG/DAY FEMALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	10.98	4.067	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
FINAL BODY WT(G)	270.			HEART	INTESTINE	KIDNEYS	LIVER
				LN, MESENTERIC	LUNGS	MAMMARY GLAND	OVIDUCTS
				OVARIES	PANCREAS	PITUITARY	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
				UTERUS	CERVIX	VAGINA	LN, AXILLARY
				SKIN, TREATED	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 10

ANIMAL NO. 3831 GROUP 8: 600 MG/KG/DAY FEMALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	10.53	4.639	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
FINAL BODY WT(G)	227.			HEART	INTESTINE	KIDNEYS	LIVER
				LN, MESENTERIC	LUNGS	MAMMARY GLAND	OVIDUCTS
				OVARIES	PANCREAS	PITUITARY	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
				UTERUS	CERVIX	VAGINA	LN, AXILLARY
				SKIN, TREATED	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R20 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 11

ANIMAL NO. 4240 GROUP 9: 750 MG/KG/DAY FEMALE SCHEDULED EUTH 03/10/11 DATE OF DEATH: 03/10/11 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
LIVER	12.04	4.195	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
FINAL BODY WT(G)	287.			HEART	INTESTINE	KIDNEYS	LIVER
				LN, MESENTERIC	LUNGS	MAMMARY GLAND	OVIDUCTS
				OVARIES	PANCREAS	PITUITARY	SPINAL CORD
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
				THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
				UTERUS	CERVIX	VAGINA	LN, AXILLARY
				SKIN, TREATED	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO.	4244	GROUP	9: 750 MG/KG/DAY	FEMALE	SCHEDULED EUTH	03/10/11	DATE OF DEATH: 03/10/11	STUDY DAY: 14
								GRADE

ORGAN WEIGHT	ABS.(G)	REL.	STOMACH	GROSS: AREA(S), DARK RED				P
LIVER	8.23	3.900		ONE, IRREGULARLY SHAPED, GLANDULAR PORTION				
FINAL BODY WT(G)	211.		NO SIGNIFICANT					
			CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES	
				HEART	INTESTINE	KIDNEYS	LIVER	
				LN, MESENTERIC	LUNGS	MAMMARY GLAND	OVIDUCTS	
				OVARIES	PANCREAS	PITUITARY	SPINAL CORD	
				SAL. GLAND MAND	SKIN	SPLEEN	THYMUS	
				THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS	
				CERVIX	VAGINA	LN, AXILLARY	SKIN, TREATED	
				SKIN, UNTREATED				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PGRHv4.66
03/23/2011

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R21 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 1

MALE GROUP: 450 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
5656	318.	13.55
5668	420.	16.93
MEAN	369.	15.24
S.D.	72.1	2.390
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R21 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 2

MALE GROUP: 600 MG/KG/DAY

ANIMAL FBW(G)		LIVER
5670	374.	17.46
5678	394.	14.95
MEAN	384.	16.21
S.D.	14.1	1.775
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R21 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 3

MALE GROUP: 750 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
4469	395.	18.12
4470	356.	14.76
MEAN	376.	16.44
S.D.	27.6	2.376
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R21 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 4

FEMALE GROUP: 450 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
3832	235.	10.31
4234	236.	10.77
MEAN	236.	10.54
S.D.	0.7	0.325
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R21 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 5

FEMALE GROUP: 600 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
3828	270.	10.98
3831	227.	10.53
MEAN	249.	10.76
S.D.	30.4	0.318
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R21 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 6

FEMALE GROUP: 750 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
4240	287.	12.04
4244	211.	8.23
MEAN	249.	10.14
S.D.	53.7	2.694
N	2	2

FBW = FINAL BODY WEIGHT

POFBWv4.28
03/23/2011
R:07/18/2012

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R22 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 1

MALE GROUP: 450 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
5656	318.	4.261
5668	420.	4.031
MEAN	369.	4.146
S.D.	72.1	0.1626
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R22 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 2

MALE GROUP: 600 MG/KG/DAY

ANIMAL FBW(G)		LIVER
5670	374.	4.668
5678	394.	3.794
MEAN	384.	4.231
S.D.	14.1	0.6180
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R22 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 3

MALE GROUP: 750 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
4469	395.	4.587
4470	356.	4.146
MEAN	376.	4.367
S.D.	27.6	0.3118
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R22 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 4

FEMALE GROUP: 450 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
3832	235.	4.387
4234	236.	4.564
MEAN	236.	4.476
S.D.	0.7	0.1252
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R22 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 5

FEMALE GROUP: 600 MG/KG/DAY

ANIMAL FBW(G)		LIVER
3828	270.	4.067
3831	227.	4.639
MEAN	249.	4.353
S.D.	30.4	0.4045
N	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021R
SPONSOR:AMERICAN PETROLEUM

TABLE R22 (SCHEDULED NECROPSY - GROUPS 7-9)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 6

FEMALE GROUP: 750 MG/KG/DAY

ANIMAL	FBW(G)	LIVER
4240	287.	4.195
4244	211.	3.900
MEAN	249.	4.048
S.D.	53.7	0.2086
N	2	2

FBW = FINAL BODY WEIGHT

POFBWv4.28
03/23/2011
R:07/18/2012

APPENDIX E

Scoring Criteria for Dermal Reactions

SCORING CRITERIA FOR DERMAL REACTIONSEvaluation of Dermal Reactions*

<u>Value</u>	<u>Erythema and Eschar Formation</u>	<u>Computer Designation</u>
0	No erythema	No erythema
1	Very slight erythema (barely perceptible, edges of area not well defined)	Very slight erythema
2	Slight erythema (pale red in color and edges definable)	Slight erythema
3	Moderate to severe erythema (definite red in color and area well defined)	Moderate erythema
4	Severe erythema (beet or crimson red) to slight eschar formation (injuries in depth)	Severe erythema

<u>Value</u>	<u>Edema Formation</u>	<u>Computer Designation</u>
0	No edema	No edema
1	Very slight edema (barely perceptible, edges of area not well defined)	Very slight edema
2	Slight edema (edges of area well defined by definite raising)	Slight edema
3	Moderate edema (raised approximately 1 mm)	Moderate edema
4	Severe edema (raised more than 1 mm and extending beyond area of exposure)	Severe edema

* Draize, J.H. The appraisal of the safety of chemicals in foods, drugs and cosmetics. *Dermal Toxicity* **1965**, 46-59. Assoc. of Food and Drug Officials of the U.S., Topeka, Kansas and the EPA-OPPTS Health Effects Test Guidelines **1998**.

APPENDIX F

Unscheduled Dermal Observations

PROJECT NO.:WIL-402021U
 SPONSOR:AMERICAN PETROLEUM

TABLE U1 (UNSCHEDULED OBSERVATIONS)
 14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
 INDIVIDUAL DERMAL OBSERVATIONS

PAGE 1

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90226	M	1000 MG/KG/DAY	DERMAL OBS	6	13:10	P	ERYTHEMA - SLIGHT
				6	13:10	P	EDEMA - MODERATE
				6	13:10	P	DESQUAMATION
90227	M	1000 MG/KG/DAY	DERMAL OBS	6	13:13	P	ERYTHEMA - SLIGHT
				6	13:13	P	EDEMA - VERY SLIGHT
				6	13:13	P	DESQUAMATION
90213	M	1290 MG/KG/DAY	DERMAL OBS	6	12:22	P	ERYTHEMA - MODERATE
				6	12:22	P	EDEMA - MODERATE
				6	12:22	P	DESQUAMATION
90215	M	1290 MG/KG/DAY	DERMAL OBS	6	12:27	P	ERYTHEMA - SLIGHT
				6	12:27	P	EDEMA - MODERATE
				6	12:27	P	DESQUAMATION
90230	F	1000 MG/KG/DAY	DERMAL OBS	9	11:48	P	ERYTHEMA - VERY SLIGHT
				9	11:48	P	NO EDEMA
				9	11:48	P	DESQUAMATION
90234	F	1000 MG/KG/DAY	DERMAL OBS	9	11:49	P	NO ERYTHEMA
				9	11:49	P	EDEMA - MODERATE
				9	11:49	P	DESQUAMATION
				9	11:49	P	ENCRUSTATION
90229	F	1290 MG/KG/DAY	DERMAL OBS	6	12:29	P	ERYTHEMA - SLIGHT
				6	12:29	P	EDEMA - MODERATE
				6	12:29	P	DESQUAMATION
90232	F	1290 MG/KG/DAY	DERMAL OBS	6	12:32	P	ERYTHEMA - SLIGHT
				6	12:32	P	EDEMA - MODERATE
				6	12:32	P	DESQUAMATION

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.17
 01/07/2011
 R:01/07/2011

FINAL REPORT



Contents: Volume 2 of 2
Appendix G

Study Title: A 14-Day Dose Range Finding Dermal Toxicity
Study Utilizing Petroleum Products, Diesel Oil
(Ultra Low Sulfur Diesel Fuel) in Sprague Dawley Rats

Study Number: WIL-402021

Study Director: [REDACTED]

Data Requirements: Not Applicable

Study Initiation Date: 2 December 2010

Study Completion Date: 18 January 2013

Performing Laboratory: WIL Research
1407 George Road
Ashland, OH 44805-8946

Sponsor Number: Not Applicable

Sponsor: American Petroleum Institute
1220 L Street, NW
Washington, DC 20005

APPENDIX G

Individual Animal Data

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A1
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL SURVIVAL AND DISPOSITION

PAGE 1

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	STUDY DAY
90216	M	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90225	M	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90222	M	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90224	M	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90214	M	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90217	M	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90218	M	300 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90220	M	300 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90226	M	1000 MG/KG/DAY	EUTHANIZED IN EXTREMIS	8	09-DEC-10	6
90227	M	1000 MG/KG/DAY	EUTHANIZED IN EXTREMIS	8	09-DEC-10	6
90213	M	1290 MG/KG/DAY	EUTHANIZED IN EXTREMIS	8	09-DEC-10	6
90215	M	1290 MG/KG/DAY	EUTHANIZED IN EXTREMIS	8	09-DEC-10	6

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (8)

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A1
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL SURVIVAL AND DISPOSITION

PAGE 2

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	STUDY DAY
90237	F	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90240	F	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90235	F	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90239	F	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90228	F	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90233	F	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90236	F	300 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90241	F	300 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90230	F	1000 MG/KG/DAY	EUTHANIZED IN EXTREMIS	9	12-DEC-10	9
90234	F	1000 MG/KG/DAY	EUTHANIZED IN EXTREMIS	9	12-DEC-10	9
90229	F	1290 MG/KG/DAY	EUTHANIZED IN EXTREMIS	8	09-DEC-10	6
90232	F	1290 MG/KG/DAY	EUTHANIZED IN EXTREMIS	8	09-DEC-10	6

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (8)

PDEADv4.07
12/30/2010
R:07/13/2012

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 1

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90216	M	UNTREATED	NORMAL	0	7:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90216	M	UNTREATED	DISPOSITION	14	9:08	P	PRIMARY NECROPSY (DAY 14)
90216	M	UNTREATED	EYES/EARS/NOSE	7	7:41	P	DRIED RED MATERIAL AROUND NOSE
				14	8:22	P	DRIED RED MATERIAL AROUND NOSE
90225	M	UNTREATED	NORMAL	0	7:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90225	M	UNTREATED	DISPOSITION	14	9:08	P	PRIMARY NECROPSY (DAY 14)
90225	M	UNTREATED	EYES/EARS/NOSE	7	7:42	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	7:42	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	7:42	P	DRIED RED MATERIAL AROUND NOSE
				14	8:22	P	DRIED RED MATERIAL AROUND NOSE
90222	M	0 MG/KG/DAY	NORMAL	0	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90222	M	0 MG/KG/DAY	DISPOSITION	14	9:08	P	PRIMARY NECROPSY (DAY 14)
90222	M	0 MG/KG/DAY	EYES/EARS/NOSE	7	7:56	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	7:56	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	7:56	P	DRIED RED MATERIAL AROUND NOSE
				7	7:56	P	WET YELLOW MATERIAL UROGENITAL AREA
				14	8:25	P	DRIED RED MATERIAL AROUND RIGHT EYE
				14	8:25	P	DRIED RED MATERIAL AROUND LEFT EYE
90222	M	0 MG/KG/DAY	EXCRETA	7	7:56	P	WET YELLOW MATERIAL ANOGENITAL AREA
90224	M	0 MG/KG/DAY	NORMAL	0	7:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90224	M	0 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90224	M	0 MG/KG/DAY	EYES/EARS/NOSE	7	7:58	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	7:58	P	DRIED RED MATERIAL AROUND NOSE
				14	8:26	P	DRIED RED MATERIAL AROUND LEFT EYE
90224	M	0 MG/KG/DAY	EXCRETA	7	7:58	P	DRIED YELLOW MATERIAL UROGENITAL AREA
90214	M	100 MG/KG/DAY	NORMAL	0	7:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90214	M	100 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90214	M	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:02	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	8:02	P	DRIED RED MATERIAL AROUND LEFT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 2

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90214	M	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:02	P	DRIED RED MATERIAL AROUND NOSE
				7	8:02	P	WET YELLOW MATERIAL UROGENITAL AREA
				14	8:31	P	DRIED YELLOW MATERIAL AROUND LEFT EYE
				14	8:31	P	DRIED YELLOW MATERIAL AROUND RIGHT EYE
				14	8:31	P	DRIED RED MATERIAL AROUND NOSE
90217	M	100 MG/KG/DAY	NORMAL	0	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90217	M	100 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90217	M	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:03	P	DRIED RED MATERIAL AROUND NOSE
				14	8:32	P	DRIED RED MATERIAL AROUND NOSE
90218	M	300 MG/KG/DAY	NORMAL	0	7:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90218	M	300 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90218	M	300 MG/KG/DAY	EYES/EARS/NOSE	7	8:07	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	8:07	P	DRIED RED MATERIAL AROUND NOSE
				14	8:35	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	8:35	P	DRIED RED MATERIAL AROUND NOSE
90220	M	300 MG/KG/DAY	NORMAL	0	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90220	M	300 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90220	M	300 MG/KG/DAY	EYES/EARS/NOSE	7	8:08	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	8:08	P	DRIED RED MATERIAL AROUND NOSE
				14	8:36	P	DRIED RED MATERIAL AROUND RIGHT EYE
				14	8:36	P	DRIED RED MATERIAL AROUND LEFT EYE
				14	8:36	P	DRIED RED MATERIAL AROUND NOSE
90226	M	1000 MG/KG/DAY	NORMAL	0	7:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90226	M	1000 MG/KG/DAY	DISPOSITION	6	13:11	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90226	M	1000 MG/KG/DAY	EYES/EARS/NOSE	6	13:10	P	DRIED RED MATERIAL AROUND RIGHT EYE
				6	13:10	P	DRIED RED MATERIAL AROUND LEFT EYE
				6	13:10	P	DRIED RED MATERIAL AROUND NOSE
90226	M	1000 MG/KG/DAY	EXCRETA	6	13:11	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				6	13:11	P	DRIED YELLOW MATERIAL ANOGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 3

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90226	M	1000 MG/KG/DAY	EXCRETA	6	13:11	P	DRIED YELLOW MATERIAL VENTRAL TRUNK
90227	M	1000 MG/KG/DAY	DISPOSITION	6	13:14	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90227	M	1000 MG/KG/DAY	EYES/EARS/NOSE	6	13:13	P	DRIED RED MATERIAL AROUND RIGHT EYE
				6	13:13	P	DRIED RED MATERIAL AROUND LEFT EYE
				6	13:14	P	DRIED RED MATERIAL AROUND NOSE
90227	M	1000 MG/KG/DAY	EXCRETA	0	7:42	P	SOFT FECES
				6	13:14	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				6	13:14	P	DRIED YELLOW MATERIAL ANOGENITAL AREA
				6	13:14	P	DRIED YELLOW MATERIAL VENTRAL TRUNK
90213	M	1290 MG/KG/DAY	NORMAL	0	7:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90213	M	1290 MG/KG/DAY	DISPOSITION	6	12:26	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90213	M	1290 MG/KG/DAY	EYES/EARS/NOSE	6	12:23	P	DRIED RED MATERIAL AROUND RIGHT EYE
				6	12:23	P	DRIED RED MATERIAL AROUND LEFT EYE
90213	M	1290 MG/KG/DAY	EXCRETA	6	12:24	P	DRIED YELLOW MATERIAL UROGENITAL AREA
90215	M	1290 MG/KG/DAY	NORMAL	0	7:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90215	M	1290 MG/KG/DAY	DISPOSITION	6	12:28	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90215	M	1290 MG/KG/DAY	EYES/EARS/NOSE	6	12:27	P	DRIED RED MATERIAL AROUND RIGHT EYE
				6	12:27	P	DRIED RED MATERIAL AROUND LEFT EYE
				6	12:27	P	DRIED RED MATERIAL AROUND NOSE
90215	M	1290 MG/KG/DAY	EXCRETA	6	12:28	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				6	12:28	P	DRIED YELLOW MATERIAL ANOGENITAL AREA
				6	12:28	P	DRIED YELLOW MATERIAL VENTRAL TRUNK
90237	F	UNTREATED	NORMAL	0	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90237	F	UNTREATED	DISPOSITION	14	9:08	P	PRIMARY NECROPSY (DAY 14)
90237	F	UNTREATED	EYES/EARS/NOSE	7	7:43	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	7:43	P	DRIED RED MATERIAL AROUND NOSE
				7	7:43	P	WET YELLOW MATERIAL UROGENITAL AREA
				14	8:23	P	DRIED YELLOW MATERIAL AROUND LEFT EYE
				14	8:23	P	DRIED YELLOW MATERIAL AROUND RIGHT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 4

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90240	F	UNTREATED	NORMAL	0	7:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90240	F	UNTREATED	DISPOSITION	14	9:08	P	PRIMARY NECROPSY (DAY 14)
90240	F	UNTREATED	EYES/EARS/NOSE	7	7:44	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	7:44	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	7:44	P	DRIED RED MATERIAL AROUND NOSE
90235	F	0 MG/KG/DAY	NORMAL	0	7:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90235	F	0 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90235	F	0 MG/KG/DAY	BODY/INTEGUMENT	14	8:28	P	HAIR LOSS FACIAL AREA
90235	F	0 MG/KG/DAY	EYES/EARS/NOSE	7	7:59	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	7:59	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	7:59	P	DRIED RED MATERIAL AROUND NOSE
90235	F	0 MG/KG/DAY	EXCRETA	7	8:00	P	DRIED YELLOW MATERIAL UROGENITAL AREA
90239	F	0 MG/KG/DAY	NORMAL	0	7:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90239	F	0 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90239	F	0 MG/KG/DAY	BODY/INTEGUMENT	14	8:30	P	HAIR LOSS FACIAL AREA
90239	F	0 MG/KG/DAY	EYES/EARS/NOSE	7	8:01	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	8:01	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	8:01	P	DRIED RED MATERIAL AROUND NOSE
90228	F	100 MG/KG/DAY	NORMAL	0	7:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90228	F	100 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90228	F	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:04	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	8:04	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	8:04	P	DRIED RED MATERIAL AROUND NOSE
				14	8:33	P	DRIED YELLOW MATERIAL AROUND RIGHT EYE
90233	F	100 MG/KG/DAY	NORMAL	0	7:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90233	F	100 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90233	F	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:06	P	DRIED RED MATERIAL AROUND NOSE
				14	8:34	P	DRIED YELLOW MATERIAL AROUND LEFT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 5

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90233	F	100 MG/KG/DAY	EYES/EARS/NOSE	14	8:34	P	DRIED YELLOW MATERIAL AROUND NOSE
90236	F	300 MG/KG/DAY	NORMAL	0	7:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90236	F	300 MG/KG/DAY	DISPOSITION	14	9:09	P	PRIMARY NECROPSY (DAY 14)
90236	F	300 MG/KG/DAY	EYES/EARS/NOSE	7	8:09	P	DRIED RED MATERIAL AROUND NOSE
				14	8:37	P	DRIED RED MATERIAL AROUND NOSE
90241	F	300 MG/KG/DAY	NORMAL	0	7:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90241	F	300 MG/KG/DAY	DISPOSITION	14	9:10	P	PRIMARY NECROPSY (DAY 14)
90241	F	300 MG/KG/DAY	BODY/INTEGUMENT	14	8:39	P	HAIR LOSS FORELIMB(S)
90241	F	300 MG/KG/DAY	EYES/EARS/NOSE	7	8:10	P	DRIED RED MATERIAL AROUND NOSE
90241	F	300 MG/KG/DAY	BODY/INTEG II	14	8:38	P	SCABBING FORELIMB(S)
90230	F	1000 MG/KG/DAY	NORMAL	0	7:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90230	F	1000 MG/KG/DAY	DISPOSITION	9	11:49	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90230	F	1000 MG/KG/DAY	EYES/EARS/NOSE	7	8:11	P	DRIED RED MATERIAL AROUND LEFT EYE
				7	8:11	P	DRIED RED MATERIAL AROUND NOSE
				9	11:48	P	DRIED RED MATERIAL AROUND RIGHT EYE
				9	11:48	P	DRIED RED MATERIAL AROUND LEFT EYE
				9	11:48	P	DRIED RED MATERIAL AROUND NOSE
90230	F	1000 MG/KG/DAY	EXCRETA	7	8:11	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				9	11:49	P	DRIED YELLOW MATERIAL UROGENITAL AREA
90234	F	1000 MG/KG/DAY	NORMAL	0	7:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90234	F	1000 MG/KG/DAY	DISPOSITION	9	11:59	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90234	F	1000 MG/KG/DAY	EYES/EARS/NOSE	7	8:12	P	DRIED RED MATERIAL AROUND NOSE
				7	8:12	P	WET YELLOW MATERIAL UROGENITAL AREA
				9	11:50	P	WET YELLOW MATERIAL UROGENITAL AREA
90234	F	1000 MG/KG/DAY	BODY/INTEG II	9	11:50	P	SCABBING VENTRAL TRUNK
				9	11:50	P	SCABBING HINDLIMB(S)
90229	F	1290 MG/KG/DAY	NORMAL	0	7:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90229	F	1290 MG/KG/DAY	DISPOSITION	6	12:32	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90229	F	1290 MG/KG/DAY	EYES/EARS/NOSE	6	12:32	P	DRIED YELLOW MATERIAL AROUND LEFT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 6

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90229	F	1290 MG/KG/DAY	EYES/EARS/NOSE	6	12:32	P	DRIED YELLOW MATERIAL AROUND RIGHT EYE
				6	12:32	P	DRIED YELLOW MATERIAL AROUND NOSE
90229	F	1290 MG/KG/DAY	EXCRETA	6	12:30	P	DRIED YELLOW MATERIAL UROGENITAL AREA
				6	12:30	P	DRIED YELLOW MATERIAL ANOGENITAL AREA
				6	12:30	P	DRIED YELLOW MATERIAL HINDLIMB(S)
90232	F	1290 MG/KG/DAY	NORMAL	0	7:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90232	F	1290 MG/KG/DAY	DISPOSITION	6	12:35	P	EUTHANIZED IN EXTREMIS - PHYSICAL CONDITION
90232	F	1290 MG/KG/DAY	BEHAVIOR/CNS	6	12:34	P	VOCALIZATION UPON HANDLING
90232	F	1290 MG/KG/DAY	EYES/EARS/NOSE	6	12:33	P	DRIED RED MATERIAL AROUND RIGHT EYE
				6	12:33	P	DRIED RED MATERIAL AROUND LEFT EYE
				6	12:33	P	DRIED RED MATERIAL AROUND NOSE
				6	12:33	P	WET YELLOW MATERIAL UROGENITAL AREA
90232	F	1290 MG/KG/DAY	EXCRETA	6	12:34	P	WET YELLOW MATERIAL ANOGENITAL AREA
				6	12:34	P	WET YELLOW MATERIAL HINDLIMB(S)
				6	12:34	P	WET YELLOW MATERIAL VENTRAL TRUNK

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.17
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 1

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90216	M	UNTREATED	NORMAL	0	13:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90225	M	UNTREATED	NORMAL	0	13:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90222	M	0 MG/KG/DAY	NORMAL	0	13:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 2

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90222	M	0 MG/KG/DAY	NORMAL	1	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90224	M	0 MG/KG/DAY	NORMAL	0	13:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90214	M	100 MG/KG/DAY	NORMAL	0	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 3

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90214	M	100 MG/KG/DAY	NORMAL	2	12:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90217	M	100 MG/KG/DAY	NORMAL	0	13:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90218	M	300 MG/KG/DAY	NORMAL	0	13:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 4

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90218	M	300 MG/KG/DAY	NORMAL	3	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90220	M	300 MG/KG/DAY	NORMAL	0	13:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90226	M	1000 MG/KG/DAY	NORMAL	0	13:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 5

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90226	M	1000 MG/KG/DAY	NORMAL	6	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90226	M	1000 MG/KG/DAY	SPECIAL II	5	10:00	P	VOCALIZATION DURING DOSING
90227	M	1000 MG/KG/DAY	NORMAL	0	13:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90213	M	1290 MG/KG/DAY	NORMAL	0	13:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90213	M	1290 MG/KG/DAY	SPECIAL II	5	10:04	P	VOCALIZATION DURING DOSING
90215	M	1290 MG/KG/DAY	NORMAL	0	13:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90237	F	UNTREATED	NORMAL	0	13:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 6

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90237	F	UNTREATED	NORMAL	8	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90240	F	UNTREATED	NORMAL	0	13:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90235	F	0 MG/KG/DAY	NORMAL	0	13:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 7

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90235	F	0 MG/KG/DAY	NORMAL	9	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90239	F	0 MG/KG/DAY	NORMAL	0	13:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90228	F	100 MG/KG/DAY	NORMAL	0	13:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 8

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90228	F	100 MG/KG/DAY	NORMAL	10	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90233	F	100 MG/KG/DAY	NORMAL	0	13:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90236	F	300 MG/KG/DAY	NORMAL	0	13:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 9

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90236	F	300 MG/KG/DAY	NORMAL	11	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90241	F	300 MG/KG/DAY	NORMAL	0	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90230	F	1000 MG/KG/DAY	NORMAL	0	13:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90230	F	1000 MG/KG/DAY	SPECIAL II	5	10:02	P	VOCALIZATION DURING DOSING
				6	9:36	P	VOCALIZATION DURING DOSING
				9	9:15	P	VOCALIZATION DURING DOSING
90234	F	1000 MG/KG/DAY	NORMAL	0	13:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A3 (AT TIME OF DOSING)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 10

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90234	F	1000 MG/KG/DAY	NORMAL	2	12:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90229	F	1290 MG/KG/DAY	NORMAL	0	13:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90232	F	1290 MG/KG/DAY	NORMAL	0	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90232	F	1290 MG/KG/DAY	SPECIAL II	5	10:06	P	VOCALIZATION DURING DOSING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.17
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 1

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90216	M	UNTREATED	NORMAL	0	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90225	M	UNTREATED	NORMAL	0	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90222	M	0 MG/KG/DAY	NORMAL	0	15:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 2

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90222	M	0 MG/KG/DAY	NORMAL	1	13:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90224	M	0 MG/KG/DAY	NORMAL	0	15:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90214	M	100 MG/KG/DAY	NORMAL	0	15:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 3

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90214	M	100 MG/KG/DAY	NORMAL	2	13:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90217	M	100 MG/KG/DAY	NORMAL	0	15:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90218	M	300 MG/KG/DAY	NORMAL	0	15:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 4

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90218	M	300 MG/KG/DAY	NORMAL	3	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90220	M	300 MG/KG/DAY	NORMAL	0	15:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90226	M	1000 MG/KG/DAY	NORMAL	0	15:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 5

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90226	M	1000 MG/KG/DAY	NORMAL	4	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90227	M	1000 MG/KG/DAY	NORMAL	0	15:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90213	M	1290 MG/KG/DAY	NORMAL	0	15:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90215	M	1290 MG/KG/DAY	NORMAL	0	15:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90237	F	UNTREATED	NORMAL	0	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 6

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90237	F	UNTREATED	NORMAL	5	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90240	F	UNTREATED	NORMAL	0	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90235	F	0 MG/KG/DAY	NORMAL	0	15:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
 SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
 14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
 INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 7

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90235	F	0 MG/KG/DAY	NORMAL	6	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90239	F	0 MG/KG/DAY	NORMAL	0	15:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90228	F	100 MG/KG/DAY	NORMAL	0	15:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 8

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90228	F	100 MG/KG/DAY	NORMAL	7	12:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90233	F	100 MG/KG/DAY	NORMAL	0	15:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90236	F	300 MG/KG/DAY	NORMAL	0	15:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 9

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90236	F	300 MG/KG/DAY	NORMAL	8	10:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90241	F	300 MG/KG/DAY	NORMAL	0	15:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90230	F	1000 MG/KG/DAY	NORMAL	0	15:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A4 (DOSING DAY OBSERVATIONS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CLINICAL OBSERVATIONS

PAGE 10

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90230	F	1000 MG/KG/DAY	NORMAL	9	10:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90234	F	1000 MG/KG/DAY	NORMAL	0	15:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	12:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90229	F	1290 MG/KG/DAY	NORMAL	0	15:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90229	F	1290 MG/KG/DAY	EYES/EARS/NOSE	3	12:12	P	WET YELLOW MATERIAL UROGENITAL AREA
90232	F	1290 MG/KG/DAY	NORMAL	0	15:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	13:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90232	F	1290 MG/KG/DAY	EYES/EARS/NOSE	3	12:12	P	WET YELLOW MATERIAL UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.17
12/30/2010
R:12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 1

GROUP : UNTREATED		ANIMAL NO. / SEX
90216/M	90225/M	
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	SNR	SNR
3	SNR	SNR
4	SNR	SNR
5	SNR	SNR
6	SNR	SNR
7	SNR	SNR
8	SNR	SNR
9	SNR	SNR
10	SNR	SNR
11	SNR	SNR
12	SNR	SNR
13	SNR	SNR
14	SNR	SNR

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
SEX CODE: M = MALE F = FEMALE
SNR = SCORED, NOT REMARKABLE

GROUP : 0 MG/KG/DAY		ANIMAL NO. / SEX
90222/M		90224/M
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	SNR	SNR
3	SNR	SNR
4	0/0/h	0/0/h
5	0/0/h	0/0/h
6	0/0/h	0/0/h
7	0/0/h	0/0/h
8	0/0/h	0/0/h
9	0/0/h	0/0/h
10	0/0/h	0/0/h
11	0/0/h	0/0/h
12	0/0/h	0/0/h
13	SNR	0/0/h
14	0/0/h	0/0/h

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
SEX CODE: M = MALE F = FEMALE
SNR = SCORED, NOT REMARKABLE
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 3

GROUP : 100 MG/KG/DAY			ANIMAL NO. / SEX	
90214/M			90217/M	
STUDY DAY			ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR		
1	SNR	SNR		
2	SNR	SNR		
3	SNR	SNR		
4	1/0	SNR		
5	1/0/h	1/0/h		
6	1/0/h	0/0/h		
7	SNR	SNR		
8	0/0/h	0/0/h		
9	0/0/d	0/0/h		
10	0/0/dh	0/0/h		
11	0/0/dh	0/0/h		
12	0/0/dh	0/0/h		
13	0/0/dh	0/0/h		
14	0/0/dh	0/0/h		
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA				
SEX CODE: M = MALE F = FEMALE				
d = DESQUAMATION, SNR = SCORED, NOT REMARKABLE				
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE				

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 4

GROUP : 300 MG/KG/DAY			ANIMAL NO. / SEX	
90218/M			90220/M	
STUDY DAY			ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR		
1	SNR	SNR		
2	SNR	SNR		
3	SNR	SNR		
4	2/0/h	1/0/h		
5	1/0/h	1/0/h		
6	1/0/h	1/0/h		
7	0/0/h	2/0		
8	0/0/h	1/0/h		
9	0/0/h	1/0/h		
10	0/0/h	1/0/h		
11	0/0/h	0/0/h		
12	0/0/h	0/0/h		
13	0/0/h	0/0/h		
14	0/0/h	0/0/h		
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA				
SEX CODE: M = MALE F = FEMALE				
d = DESQUAMATION, SNR = SCORED, NOT REMARKABLE				
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE				

GROUP : 1000 MG/KG/DAY		ANIMAL NO. / SEX
90226/M		90227/M
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	SNR	SNR
3	0/0/h	SNR
4	3/2/dx	1/1/d
5	3/3/dx	2/0/d
6	2/3/d	2/1/d
7	DEAD	DEAD

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
SEX CODE: M = MALE F = FEMALE
d = DESQUAMATION, x = EXFOLIATION, SNR = SCORED, NOT REMARKABLE
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 6

GROUP : 1290 MG/KG/DAY			ANIMAL NO. / SEX		
90213/M			90215/M		
STUDY DAY		ERYTHEMA+/EDEMA+/OTHER FINDINGS			
0	SNR	SNR			
1	SNR	SNR			
2	SNR	SNR			
3	0/0/h	0/0/h			
4	2/3/d	2/3/d			
5	2/3/d	2/3/d			
6	2/3/d	2/3/d			
7	DEAD	DEAD			

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
SEX CODE: M = MALE F = FEMALE
d = DESQUAMATION, x = EXFOLIATION, SNR = SCORED, NOT REMARKABLE
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

PROJECT NO.:WIL-402021	TABLE A5 14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL	PAGE 7
SPONSOR:AMERICAN PETROLEUM	INDIVIDUAL DERMAL OBSERVATIONS	

GROUP :	UNTREATED	ANIMAL NO. / SEX
	90237/F	90240/F
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	SNR	SNR
3	SNR	SNR
4	SNR	SNR
5	SNR	SNR
6	SNR	SNR
7	SNR	SNR
8	SNR	SNR
9	SNR	SNR
10	SNR	SNR
11	SNR	SNR
12	SNR	SNR
13	SNR	SNR
14	SNR	SNR

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
 SEX CODE: M = MALE F = FEMALE
 d = DESQUAMATION, x = EXFOLIATION, SNR = SCORED, NOT REMARKABLE

GROUP : 0 MG/KG/DAY		ANIMAL NO. / SEX
90235/F		90239/F
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	SNR	SNR
3	SNR	SNR
4	0/0/h	0/0/h
5	0/0/h	0/0/h
6	0/0/h	0/0/h
7	SNR	SNR
8	0/0/h	0/0/h
9	0/0/h	0/0/h
10	0/0/h	0/0/h
11	0/0/h	0/0/h
12	0/0/h	0/0/h
13	0/0/h	0/0/h
14	0/0/h	0/0/h
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA		
SEX CODE: M = MALE F = FEMALE		
d = DESQUAMATION, x = EXFOLIATION, SNR = SCORED, NOT REMARKABLE		
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE		

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 9

GROUP : 100 MG/KG/DAY			ANIMAL NO. / SEX	
90228/F			90233/F	
STUDY DAY			ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR		
1	SNR	SNR		
2	SNR	SNR		
3	SNR	SNR		
4	0/0/h	0/0/h		
5	0/0/h	0/0/h		
6	0/0/h	0/0/h		
7	0/0/h	0/0/h		
8	0/0/h	0/0/h		
9	0/0/h	0/0/h		
10	0/0/h	0/0/h		
11	0/0/h	0/0/h		
12	0/0/h	0/0/h		
13	0/0/h	0/0/h		
14	0/0/h	0/0/h		
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA				
SEX CODE: M = MALE F = FEMALE				
d = DESQUAMATION, x = EXFOLIATION, SNR = SCORED, NOT REMARKABLE				
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE				

GROUP : 300 MG/KG/DAY		ANIMAL NO. / SEX
90236/F		90241/F
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	SNR	SNR
3	SNR	SNR
4	SNR	0/0/h
5	0/0/h	0/0/h
6	0/0/h	0/0/h
7	0/0/h	0/0/h
8	0/0/h	0/0/h
9	0/0/h	0/0/h
10	0/0/h	0/0/h
11	0/0/h	0/0/h
12	0/0/h	0/0/h
13	SNR	SNR
14	0/0/h	0/0/h
+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA		
SEX CODE: M = MALE F = FEMALE		
d = DESQUAMATION, x = EXFOLIATION, SNR = SCORED, NOT REMARKABLE		
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE		

PROJECT NO.:WIL-402021	TABLE A5	PAGE 11
SPONSOR:AMERICAN PETROLEUM	14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL	
	INDIVIDUAL DERMAL OBSERVATIONS	

GROUP : 1000 MG/KG/DAY			ANIMAL NO. / SEX
90230/F			90234/F
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS		
0	SNR	SNR	
1	SNR	SNR	
2	SNR	SNR	
3	SNR	SNR	
4	1/1/d	1/1/d	
5	1/0/d	1/1/d	
6	1/0/d	1/1/d	
7	1/0/hd	2/1/hd	
8	1/0/d	0/3/d	
9	1/0/d	0/3/dg	
10	DEAD	DEAD	

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA
SEX CODE: M = MALE F = FEMALE
d = DESQUAMATION, x = EXFOLIATION, g = ENCRUSTATION, SNR = SCORED, NOT REMARKABLE
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A5
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL DERMAL OBSERVATIONS

PAGE 12

GROUP : 1290 MG/KG/DAY		ANIMAL NO. / SEX
90229/F	90232/F	
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	SNR	SNR
3	SNR	SNR
4	1/2/d	2/2/d
5	2/3/d	2/3/d
6	2/3/d	2/3/d
7	DEAD	DEAD

+ = REFER TO DRAIZE SCALE FOR DERMAL SCORING CRITERIA

SEX CODE: M = MALE F = FEMALE

d = DESQUAMATION, x = EXFOLIATION, g = ENCRUSTATION, SNR = SCORED, NOT REMARKABLE

PIDerv3.13
01/07/2011

DAY	-7	-1	0	7	MALE GROUP: 13	UNTREATED
ANIMAL						
90216	200.	244.	256.	287.	303.	
90225	211.	259.	270.	317.	347.	
MEAN	206.	252.	263.	302.	325.	
S.D.	7.8	10.6	9.9	21.2	31.1	
N	2	2	2	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-7	-1	0	7	MALE GROUP: 0 MG/KG/DAY 13
ANIMAL					
90222	222.	263.	272.	295.	308.
90224	205.	256.	270.	300.	311.
MEAN	214.	260.	271.	298.	310.
S.D.	12.0	4.9	1.4	3.5	2.1
N	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-7	-1	0	7	MALE GROUP: 100 MG/KG/DAY 13
ANIMAL					
90214	214.	259.	273.	286.	297.
90217	224.	273.	282.	306.	329.
MEAN	219.	266.	278.	296.	313.
S.D.	7.1	9.9	6.4	14.1	22.6
N	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-7	-1	0	7	MALE GROUP: 300 MG/KG/DAY 13
ANIMAL					
90218	216.	263.	271.	304.	324.
90220	202.	247.	256.	265.	285.
MEAN	209.	255.	264.	285.	305.
S.D.	9.9	11.3	10.6	27.6	27.6
N	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-7	-1	0
MALE GROUP: 1000 MG/KG/DAY			
ANIMAL			
90226	217.	266.	279.
90227	203.	250.	258.
MEAN	210.	258.	269.
S.D.	9.9	11.3	14.8
N	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-7	-1	0
MALE GROUP: 1290 MG/KG/DAY			
ANIMAL			
90213	198.	236.	252.
90215	204.	272.	284.
MEAN	201.	254.	268.
S.D.	4.2	25.5	22.6
N	2	2	2

DAY	-7	-1	0	7	FEMALE GROUP: 13	UNTREATED
ANIMAL						
90237	182.	192.	199.	205.	215.	
90240	171.	176.	186.	191.	210.	
MEAN	177.	184.	193.	198.	213.	
S.D.	7.8	11.3	9.2	9.9	3.5	
N	2	2	2	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

PAGE 8

DAY	-7	-1	0	7	13
FEMALE GROUP: 0 MG/KG/DAY					
ANIMAL					
90235	169.	191.	193.	199.	201.
90239	172.	182.	179.	201.	204.
MEAN	171.	187.	186.	200.	203.
S.D.	2.1	6.4	9.9	1.4	2.1
N	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-7	-1	0	7	13
FEMALE GROUP: 100 MG/KG/DAY					
ANIMAL					
90228	189.	197.	202.	219.	232.
90233	163.	175.	184.	189.	194.
MEAN	176.	186.	193.	204.	213.
S.D.	18.4	15.6	12.7	21.2	26.9
N	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

PAGE 10

DAY	-7	-1	0	7	13
FEMALE GROUP: 300 MG/KG/DAY					
ANIMAL					
90236	191.	190.	203.	206.	228.
90241	163.	181.	187.	202.	215.
MEAN	177.	186.	195.	204.	222.
S.D.	19.8	6.4	11.3	2.8	9.2
N	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

DAY	-7	-1	0	7
FEMALE GROUP: 1000 MG/KG/DAY				
ANIMAL				
90230	170.	172.	183.	180.
90234	192.	209.	209.	220.
MEAN	181.	191.	196.	200.
S.D.	15.6	26.2	18.4	28.3
N	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A6
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHTS [G]

PAGE 12

DAY	-7	-1	0
FEMALE GROUP: 1290 MG/KG/DAY			
ANIMAL			
90229	182.	199.	207.
90232	178.	184.	197.
MEAN	180.	192.	202.
S.D.	2.8	10.6	7.1
N	2	2	2

PBFTSv4.48
12/30/2010
R:01/07/2011

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13	MALE GROUP: UNTREATED

ANIMAL					
90216	44.	12.	31.	16.	
90225	48.	11.	47.	30.	
MEAN	46.	12.	39.	23.	
S.D.	2.8	0.7	11.3	9.9	
N	2	2	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALE GROUP: 0 MG/KG/DAY				
DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13

ANIMAL				
90222	41.	9.	23.	13.
90224	51.	14.	30.	11.
MEAN	46.	12.	27.	12.
S.D.	7.1	3.5	4.9	1.4
N	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALE GROUP: 100 MG/KG/DAY				
DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13

ANIMAL				
90214	45.	14.	13.	11.
90217	49.	9.	24.	23.
MEAN	47.	12.	19.	17.
S.D.	2.8	3.5	7.8	8.5
N	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

									MALE GROUP: 300 MG/KG/DAY		
DAY	-7 TO	-1	-1 TO	0	0 TO	7	7 TO	13			

ANIMAL											
90218	47.		8.		33.		20.				
90220	45.		9.		9.		20.				
MEAN	46.		9.		21.		20.				
S.D.	1.4		0.7		17.0		0.0				
N	2		2		2		2				

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

PAGE 5

DAY	-7 TO -1	-1 TO 0

ANIMAL		
90226	49.	13.
90227	47.	8.
MEAN	48.	11.
S.D.	1.4	3.5
N	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALE GROUP: 1290 MG/KG/DAY			
DAY	-7 TO -1	-1 TO 0	

ANIMAL			
90213	38.	16.	
90215	68.	12.	
MEAN	53.	14.	
S.D.	21.2	2.8	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

DAY	-7 TO	-1	-1 TO	0	0 TO	7	7 TO	13	FEMALE GROUP:	UNTREATED

ANIMAL										
90237		10.		7.		6.		10.		
90240		5.		10.		5.		19.		
MEAN		8.		9.		6.		15.		
S.D.		3.5		2.1		0.7		6.4		
N		2		2		2		2		

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALE GROUP: 0 MG/KG/DAY				
DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13

ANIMAL				
90235	22.	2.	6.	2.
90239	10.	-3.	22.	3.
MEAN	16.	-1.	14.	3.
S.D.	8.5	3.5	11.3	0.7
N	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALE GROUP: 100 MG/KG/DAY				
DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13

ANIMAL				
90228	8.	5.	17.	13.
90233	12.	9.	5.	5.
MEAN	10.	7.	11.	9.
S.D.	2.8	2.8	8.5	5.7
N	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALE GROUP: 300 MG/KG/DAY				
DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13

ANIMAL				
90236	-1.	13.	3.	22.
90241	18.	6.	15.	13.
MEAN	9.	10.	9.	18.
S.D.	13.4	4.9	8.5	6.4
N	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALE GROUP: 1000 MG/KG/DAY						
DAY	-7 TO	-1	-1 TO	0	0 TO	7

ANIMAL						
90230		2.		11.		-3.
90234		17.		0.		11.
MEAN		10.		6.		4.
S.D.		10.6		7.8		9.9
N		2		2		2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A7
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL BODY WEIGHT CHANGES [G]

PAGE 12

DAY	-7 TO -1	-1 TO 0

ANIMAL		
90229	17.	8.
90232	6.	13.
MEAN	12.	11.
S.D.	7.8	3.5
N	2	2

PBFTSv4.48
12/30/2010
R:01/07/2011

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: UNTREATED			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90216	31.	47.	
90225	47.	77.	
MEAN	39.	62.	
S.D.	11.3	21.2	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: 0 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90222	23.	36.	
90224	30.	41.	
MEAN	27.	39.	
S.D.	4.9	3.5	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: 100 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90214	13.	24.	
90217	24.	47.	
MEAN	19.	36.	
S.D.	7.8	16.3	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: 300 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90218	33.	53.	
90220	9.	29.	
MEAN	21.	41.	
S.D.	17.0	17.0	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 5

MALE GROUP: 1000 MG/KG/DAY

DAY 0 TO 7 0 TO 13

ANIMAL
90226
90227

NO ANIMALS WITH WEIGHTS FOR THESE INTERVALS

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 6

MALE GROUP: 1290 MG/KG/DAY

DAY 0 TO 7 0 TO 13

ANIMAL
90213
90215

NO ANIMALS WITH WEIGHTS FOR THESE INTERVALS

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: UNTREATED			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90237	6.	16.	
90240	5.	24.	
MEAN	6.	20.	
S.D.	0.7	5.7	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: 0 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90235	6.	8.	
90239	22.	25.	
MEAN	14.	17.	
S.D.	11.3	12.0	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: 100 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90228	17.	30.	
90233	5.	10.	
MEAN	11.	20.	
S.D.	8.5	14.1	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: 300 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90236	3.	25.	
90241	15.	28.	
MEAN	9.	27.	
S.D.	8.5	2.1	
N	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 11

FEMALE GROUP: 1000 MG/KG/DAY			
DAY	0 TO 7	0 TO 13	

ANIMAL			
90230	-3.		
90234	11.		
MEAN	4.	NA	
S.D.	9.9		
N	2		

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A8
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

PAGE 12

FEMALE GROUP: 1290 MG/KG/DAY

DAY 0 TO 7 0 TO 13

ANIMAL
90229
90232

NO ANIMALS WITH WEIGHTS FOR THESE INTERVALS

PBFTSv4.48
12/30/2010
R:12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALE GROUP: UNTREATED			
DAY	-7 TO -1	0 TO 7	7 TO 13

ANIMAL			
90216	27.	38.	39.
90225	30.	38.	NA
MEAN	29.	38.	39.
S.D.	2.1	0.0	0.0
N	2	2	1

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALE GROUP: 0 MG/KG/DAY			
DAY	-7 TO -1	0 TO 7	7 TO 13

ANIMAL			
90222	31.	37.	NA
90224	29.	37.	39.
MEAN	30.	37.	39.
S.D.	1.4	0.0	0.0
N	2	2	1

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALE GROUP: 100 MG/KG/DAY				
DAY	-7 TO -1	0 TO 7	7 TO 13	

ANIMAL				
90214	28.	38.	NA	
90217	30.	37.	NA	
MEAN	29.	38.	NA	
S.D.	1.4	0.7		
N	2	2		

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

MALE GROUP: 300 MG/KG/DAY			
DAY	-7 TO -1	0 TO 7	7 TO 13

ANIMAL			
90218	30.	NA	NA
90220	28.	27.	31.
MEAN	29.	27.	31.
S.D.	1.4	0.0	0.0
N	2	1	1

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

PAGE 5

MALE GROUP: 1000 MG/KG/DAY

DAY	-7 TO	-1

ANIMAL		
90226		28.
90227		28.
MEAN		28.
S.D.		0.0
N		2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

PAGE 6

DAY		-7 TO -1		MALE GROUP: 1290 MG/KG/DAY	

ANIMAL					
90213		28.			
90215		33.			
MEAN		31.			
S.D.		3.5			
N		2			

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: UNTREATED			
DAY	-7 TO -1	0 TO 7	7 TO 13

ANIMAL			
90237	26.	26.	31.
90240	21.	27.	26.
MEAN	24.	27.	29.
S.D.	3.5	0.7	3.5
N	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: 0 MG/KG/DAY				
DAY	-7 TO -1	0 TO 7	7 TO 13	

ANIMAL				
90235	21.	25.	28.	
90239	21.	28.	31.	
MEAN	21.	27.	30.	
S.D.	0.0	2.1	2.1	
N	2	2	2	

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: 100 MG/KG/DAY				
DAY	- 7 TO -1	0 TO 7	7 TO 13	

ANIMAL				
90228	23.	NA	NA	
90233	21.	26.	30.	
MEAN	22.	26.	30.	
S.D.	1.4	0.0	0.0	
N	2	1	1	

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: 300 MG/KG/DAY				
DAY	-7 TO -1	0 TO 7	7 TO 13	

ANIMAL				
90236	20.	31.	NA	
90241	23.	29.	29.	
MEAN	22.	30.	29.	
S.D.	2.1	1.4	0.0	
N	2	2	1	

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

FEMALE GROUP: 1000 MG/KG/DAY			
DAY	-7 TO -1	0 TO	7

ANIMAL			
90230	21.		24.
90234	25.		NA
MEAN	23.		24.
S.D.	2.8		0.0
N	2		1

NA = NOT APPLICABLE

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A9
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL FOOD CONSUMPTION [G/ANIMAL/DAY]

PAGE 12

FEMALE GROUP: 1290 MG/KG/DAY

DAY	-7 TO	-1

ANIMAL		
90229		25.
90232		20.
MEAN		23.
S.D.		3.5
N		2

PBFTSv4.48
12/30/2010
R:01/07/2011

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A10 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 1

ANIMAL NO. 90226 GROUP 5: 1000 MG/KG/DAY MALE EUTH IN EXTREMIS 12/09/10 DATE OF DEATH: 12/09/10 STUDY DAY: 6
GRADE

HARDERIAN GLANDS	GROSS: PALE				P
	BILATERAL				
SKIN	GROSS: MATTING, YELLOW				P
	NASAL				
LN, AXILLARY	GROSS: ENLARGED				P
	BILATERAL				
SKIN, TREATED	GROSS: SCABBING				P
SKIN, TREATED	GROSS: THICKENED				P
NO SIGNIFICANT					
CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
	JOINT	BRAIN	CECUM	COLON	
	DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES	
	NERVES, OPTIC	HEART	ILEUM	JEJUNUM	
	KIDNEYS	LAC. GLAND EXOR	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	SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A10 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 2

ANIMAL NO. 90227 GROUP 5: 1000 MG/KG/DAY MALE EUTH IN EXTREMIS 12/09/10 DATE OF DEATH: 12/09/10 STUDY DAY: 6
GRADE

LN, AXILLARY	GROSS: ENLARGED				P
	BILATERAL				
SKIN, TREATED	GROSS: THICKENED				P
NO SIGNIFICANT					
CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
	JOINT	BRAIN	CECUM	COLON	
	DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES	
	NERVES, OPTIC	HEART	ILEUM	JEJUNUM	
	KIDNEYS	LAC. GLAND EXOR	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	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A10 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 3

ANIMAL NO. 90213 GROUP 6: 1290 MG/KG/DAY MALE EUTH IN EXTREMIS 12/09/10 DATE OF DEATH: 12/09/10 STUDY DAY: 6
GRADE

LN, AXILLARY	GROSS: ENLARGED				P
	BILATERAL				
SKIN, TREATED	GROSS: THICKENED				P
SKIN, TREATED	GROSS: SCABBING				P
NO SIGNIFICANT					
CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
	JOINT	BRAIN	CECUM	COLON	
	DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES	
	NERVES, OPTIC	HEART	ILEUM	JEJUNUM	
	KIDNEYS	LAC. GLAND EXOR	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	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A10 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 4

ANIMAL NO. 90215 GROUP 6: 1290 MG/KG/DAY MALE EUTH IN EXTREMIS 12/09/10 DATE OF DEATH: 12/09/10 STUDY DAY: 6
GRADE

LN, AXILLARY	GROSS: ENLARGED				P
	BILATERAL				
SKIN, TREATED	GROSS: THICKENED				P
NO SIGNIFICANT					
CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
	JOINT	BRAIN	CECUM	COLON	
	DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES	
	NERVES, OPTIC	HEART	ILEUM	JEJUNUM	
	KIDNEYS	LAC. GLAND EXOR	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	SKIN, UNTREATED		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 90230 GROUP 5: 1000 MG/KG/DAY FEMALE EUTH IN EXTREMIS 12/12/10 DATE OF DEATH: 12/12/10 STUDY DAY: 9

GRADE

LN, AXILLARY	GROSS: ENLARGED				P
	BILATERAL				
NO SIGNIFICANT					
CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
	JOINT	BRAIN	CECUM	COLON	
	DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LAC. GLAND EXOR	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	UTERUS	VAGINA	CERVIX	
	SKIN, TREATED	SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A10 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 6

ANIMAL NO. 90234 GROUP 5: 1000 MG/KG/DAY FEMALE EUTH IN EXTREMIS 12/12/10 DATE OF DEATH: 12/12/10 STUDY DAY: 9
GRADE

HARDERIAN GLANDS	GROSS: PALE			P
	BILATERAL			
SKIN	GROSS: SCABBING			P
	INGUINAL, LEFT; CEO SCABBING			
LN, AXILLARY	GROSS: ENLARGED			P
	BILATERAL			
SKIN, TREATED	GROSS: SCABBING			P
	CEO SCABBING			
NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
	JOINT	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS
	MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES
	PANCREAS	PITUITARY	RECTUM	SPINAL CORD
	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SPLEEN
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
	UTERUS	VAGINA	CERVIX	SKIN, UNTREATED

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A10 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 7

ANIMAL NO. 90229 GROUP 6: 1290 MG/KG/DAY FEMALE EUTH IN EXTREMIS 12/09/10 DATE OF DEATH: 12/09/10 STUDY DAY: 6
GRADE

SKIN	GROSS: MATTING, YELLOW				P
	ENTIRE VENTRAL SURFACE				
NO SIGNIFICANT					
CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
	JOINT	BRAIN	CECUM	COLON	
	DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS	
	MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES	
	PANCREAS	PITUITARY	RECTUM	SPINAL CORD	
	SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SPLEEN	
	THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
	UTERUS	VAGINA	CERVIX	LN, AXILLARY	
	SKIN, TREATED	SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A10 (UNSCHEDULED DEATHS)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 8

ANIMAL NO. 90232 GROUP 6: 1290 MG/KG/DAY FEMALE EUTH IN EXTREMIS 12/09/10 DATE OF DEATH: 12/09/10 STUDY DAY: 6
GRADE

LN, AXILLARY	GROSS: ENLARGED				P
	BILATERAL				
SKIN, TREATED	GROSS: THICKENED				P
LN, INGUINAL	GROSS: ENLARGED				P
	BILATERAL				
NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
	JOINT	BRAIN	CECUM	COLON	
	DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
	HEART	ILEUM	JEJUNUM	KIDNEYS	
	LAC. GLAND EXOR	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	UTERUS	VAGINA	CERVIX	
	SKIN, UNTREATED				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PGRHv4.64
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 1

ANIMAL NO. 90216 GROUP 1: UNTREATED MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
BRAIN	2.01	0.744	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
LIVER	10.85	4.019		JOINT	BRAIN	CECUM	COLON
KIDNEYS	2.58	0.956		DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES
HEART	1.32	0.489		NERVES, OPTIC	HEART	ILEUM	JEJUNUM
SPLEEN	0.59	0.219		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC
PROSTATE	0.58	0.215		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
TESTES	3.39	1.256		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
EPIDIDYMIDES	0.77	0.285		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYMUS	0.4727	0.175		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS
ADRENAL GLANDS	0.0579	0.021		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
PITUITARY	0.0096	0.004		SKIN, UNTREATED			
THYROIDS/PARATHY	0.0253	0.009					
FINAL BODY WT(G)	270.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 2

ANIMAL NO. 90225 GROUP 1: UNTREATED MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT				
BRAIN	1.91	0.632	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
LIVER	10.97	3.632		JOINT	BRAIN	CECUM	COLON
KIDNEYS	3.09	1.023		DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES
HEART	1.26	0.417		NERVES, OPTIC	HEART	ILEUM	JEJUNUM
SPLEEN	0.59	0.195		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC
PROSTATE	0.70	0.232		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
TESTES	3.05	1.010		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
EPIDIDYMIDES	0.78	0.258		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYMUS	0.4005	0.133		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS
ADRENAL GLANDS	0.0769	0.025		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
PITUITARY	0.0117	0.004		SKIN, UNTREATED			
THYROIDS/PARATHY	0.0254	0.008					
FINAL BODY WT(G)	302.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 3

ANIMAL NO. 90222 GROUP 2: 0 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	LN, MANDIBULAR	GROSS: ENLARGED				
BRAIN	1.90	0.686		BILATERAL				P
LIVER	10.89	3.931	NO SIGNIFICANT					
KIDNEYS	3.02	1.090	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
HEART	1.22	0.440		JOINT	BRAIN	CECUM	COLON	
SPLEEN	0.50	0.181		DUODENUM	EPIDIDYIMIDES	ESOPHAGUS	EYES	
PROSTATE	0.35	0.126		NERVES, OPTIC	HEART	ILEUM	JEJUNUM	
TESTES	2.96	1.069		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC	
EPIDIDYIMIDES	0.82	0.296		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY	
THYMUS	0.4141	0.149		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND	
ADRENAL GLANDS	0.0627	0.023		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
PITUITARY	0.0114	0.004		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS	
THYROIDS/PARATHY	0.0187	0.007		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED	
FINAL BODY WT(G)	277.			SKIN, UNTREATED				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 4

ANIMAL NO. 90224 GROUP 2: 0 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	LN, MANDIBULAR	GROSS: ENLARGED				P
BRAIN	1.98	0.715		BILATERAL				
LIVER	11.28	4.072	NO SIGNIFICANT					
KIDNEYS	2.84	1.025	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
HEART	1.23	0.444		JOINT	BRAIN	CECUM	COLON	
SPLEEN	0.82	0.296		DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES	
PROSTATE	0.50	0.181		NERVES, OPTIC	HEART	ILEUM	JEJUNUM	
TESTES	3.24	1.170		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC	
EPIDIDYMIDES	0.69	0.249		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY	
THYMUS	0.4246	0.153		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND	
ADRENAL GLANDS	0.0670	0.024		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN	
PITUITARY	0.0106	0.004		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS	
THYROIDS/PARATHY	0.0189	0.007		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED	
FINAL BODY WT(G)	277.			SKIN, UNTREATED				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 5

ANIMAL NO. 90214 GROUP 3: 100 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	NO SIGNIFICANT				
BRAIN	1.94	0.711	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
LIVER	10.32	3.780		JOINT	BRAIN	CECUM	COLON
KIDNEYS	2.81	1.029		DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES
HEART	1.15	0.421		NERVES, OPTIC	HEART	ILEUM	JEJUNUM
SPLEEN	0.64	0.234		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC
PROSTATE	0.54	0.198		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
TESTES	3.32	1.216		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
EPIDIDYMIDES	0.76	0.278		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYMUS	0.2485	0.091		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS
ADRENAL GLANDS	0.0471	0.017		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
PITUITARY	0.0097	0.004		SKIN, UNTREATED			
THYROIDS/PARATHY	0.0196	0.007					
FINAL BODY WT(G)	273.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 6

ANIMAL NO. 90217 GROUP 3: 100 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	NO SIGNIFICANT				
BRAIN	1.98	0.673	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
LIVER	11.55	3.929		JOINT	BRAIN	CECUM	COLON
KIDNEYS	3.01	1.024		DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES
HEART	1.29	0.439		NERVES, OPTIC	HEART	ILEUM	JEJUNUM
SPLEEN	0.64	0.218		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC
PROSTATE	0.60	0.204		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
TESTES	3.43	1.167		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
EPIDIDYMIDES	0.92	0.313		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYMUS	0.4579	0.156		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS
ADRENAL GLANDS	0.0863	0.029		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
PITUITARY	0.0133	0.005		SKIN, UNTREATED			
THYROIDS/PARATHY	0.0217	0.007					
FINAL BODY WT(G)	294.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 7

ANIMAL NO. 90218 GROUP 4: 300 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
BRAIN	1.94	0.667		JOINT	BRAIN	CECUM	COLON
LIVER	10.41	3.577		DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES
KIDNEYS	2.96	1.017		NERVES, OPTIC	HEART	ILEUM	JEJUNUM
HEART	1.28	0.440		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC
SPLEEN	0.67	0.230		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
PROSTATE	0.45	0.155		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
TESTES	3.22	1.107		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
EPIDIDYMIDES	0.72	0.247		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS
THYMUS	0.5573	0.192		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
ADRENAL GLANDS	0.0543	0.019		SKIN, UNTREATED			
PITUITARY	0.0115	0.004					
THYROIDS/PARATHY	0.0260	0.009					
FINAL BODY WT(G)	291.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 8

ANIMAL NO. 90220 GROUP 4: 300 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	NO SIGNIFICANT				
BRAIN	2.08	0.829	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
LIVER	9.30	3.705		JOINT	BRAIN	CECUM	COLON
KIDNEYS	2.90	1.155		DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES
HEART	0.99	0.394		NERVES, OPTIC	HEART	ILEUM	JEJUNUM
SPLEEN	0.49	0.195		KIDNEYS	LAC. GLAND EXOR	LIVER	LN, MESENTERIC
PROSTATE	0.46	0.183		LUNGS	NERVE, SCIATIC	PANCREAS	PITUITARY
TESTES	2.70	1.076		PROSTATE	RECTUM	SPINAL CORD	SAL. GLAND MAND
EPIDIDYMIDES	0.68	0.271		STOMACH	SKELETAL MUSCLE	SKIN	SPLEEN
THYMUS	0.3514	0.140		SEMINAL VESICLES	TESTES	THYROID GLANDS	THYMUS
ADRENAL GLANDS	0.0569	0.023		TRACHEA	URINARY BLADDER	LN, AXILLARY	SKIN, TREATED
PITUITARY	0.0109	0.004		SKIN, UNTREATED			
THYROIDS/PARATHY	0.0193	0.008					
FINAL BODY WT(G)	251.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 9

ANIMAL NO. 90237 GROUP 1: UNTREATED FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	UTERUS	GROSS: CONTENTS, CLEAR FLUID				P
BRAIN	1.82	0.958		BOTH HORNS				
LIVER	7.85	4.132	NO SIGNIFICANT					
KIDNEYS	1.92	1.011	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
HEART	0.83	0.437		JOINT	BRAIN	CECUM	COLON	
SPLEEN	0.38	0.200		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
UTERUS	0.61	0.321		HEART	ILEUM	JEJUNUM	KIDNEYS	
OVARIES/OVIDUCTS	0.1248	0.066		LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS	
THYMUS	0.2763	0.145		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES	
ADRENAL GLANDS	0.0765	0.040		PANCREAS	PITUITARY	RECTUM	SPINAL CORD	
PITUITARY	0.0116	0.006		SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SKIN	
THYROID/SPLEEN	0.0234	0.012		SPLEEN	THYROID GLANDS	THYMUS	TRACHEA	
FINAL BODY WT(G)	190.			URINARY BLADDER	VAGINA	CERVIX	LN, AXILLARY	
				SKIN, TREATED	SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 10

ANIMAL NO. 90240 GROUP 1: UNTREATED FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	UTERUS	GROSS: CONTENTS, CLEAR FLUID				P
BRAIN	1.87	1.000		BOTH HORNS				
LIVER	7.79	4.166	NO SIGNIFICANT					
KIDNEYS	2.13	1.139	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
HEART	0.85	0.455		JOINT	BRAIN	CECUM	COLON	
SPLEEN	0.46	0.246		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
UTERUS	0.90	0.481		HEART	ILEUM	JEJUNUM	KIDNEYS	
OVARIES/OVIDUCTS	0.1184	0.063		LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS	
THYMUS	0.3010	0.161		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES	
ADRENAL GLANDS	0.0603	0.032		PANCREAS	PITUITARY	RECTUM	SPINAL CORD	
PITUITARY	0.0145	0.008		SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SKIN	
THYROIDS/PARATHY	0.0235	0.013		SPLEEN	THYROID GLANDS	THYMUS	TRACHEA	
FINAL BODY WT (G)	187.			URINARY BLADDER	VAGINA	CERVIX	LN, AXILLARY	
				SKIN, TREATED	SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 11

ANIMAL NO. 90235 GROUP 2: 0 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	STOMACH	GROSS: AREA(S), DARK RED				P
BRAIN	1.90	1.105		FEW, PINPOINT TO 1 MM IN DIAMETER, GLANDULAR PORTION				
LIVER	5.42	3.151	NO SIGNIFICANT					
KIDNEYS	1.72	1.000	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
HEART	0.73	0.424		JOINT	BRAIN	CECUM	COLON	
SPLEEN	0.28	0.163		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
UTERUS	0.46	0.267		HEART	ILEUM	JEJUNUM	KIDNEYS	
OVARIES/OVIDUCTS	0.1339	0.078		LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS	
THYMUS	0.2602	0.151		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES	
ADRENAL GLANDS	0.0821	0.048		PANCREAS	PITUITARY	RECTUM	SPINAL CORD	
PITUITARY	0.0142	0.008		SAL. GLAND MAND	SKELETAL MUSCLE	SKIN	SPLEEN	
THYROIDS/PARATHY	0.0245	0.014		THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER	
FINAL BODY WT(G)	172.			UTERUS	VAGINA	CERVIX	LN, AXILLARY	
				SKIN, TREATED	SKIN, UNTREATED			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 12

ANIMAL NO. 90239 GROUP 2: 0 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	STOMACH	GROSS: TRICHOBEZOAR				P
BRAIN	1.75	0.989	THYMUS	GROSS: AREA(S), DARK RED				P
LIVER	6.43	3.633		ONE, IRREGULARLY SHAPED				
KIDNEYS	2.01	1.136	NO SIGNIFICANT					
HEART	0.73	0.412	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
SPLEEN	0.36	0.203		JOINT	BRAIN	CECUM	COLON	
UTERUS	0.38	0.215		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
OVARIES/OVIDUCTS	0.1117	0.063		HEART	ILEUM	JEJUNUM	KIDNEYS	
THYMUS	0.3937	0.222		LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS	
ADRENAL GLANDS	0.0719	0.041		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES	
PITUITARY	0.0104	0.006		PANCREAS	PITUITARY	RECTUM	SPINAL CORD	
THYROIDS/PARATHY	0.0220	0.012		SAL. GLAND MAND	SKELETAL MUSCLE	SKIN	SPLEEN	
FINAL BODY WT (G)	177.			THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS	
				VAGINA	CERVIX	LN, AXILLARY	SKIN, TREATED	
				SKIN, UNTREATED				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 13

ANIMAL NO. 90228 GROUP 3: 100 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	NO SIGNIFICANT				
BRAIN	2.02	1.005	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
LIVER	7.24	3.602		JOINT	BRAIN	CECUM	COLON
KIDNEYS	1.88	0.935		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	0.80	0.398		HEART	ILEUM	JEJUNUM	KIDNEYS
SPLEEN	0.40	0.199		LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS
UTERUS	0.35	0.174		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES
OVARIES/OVIDUCTS	0.1270	0.063		PANCREAS	PITUITARY	RECTUM	SPINAL CORD
THYMUS	0.3170	0.158		SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SKIN
ADRENAL GLANDS	0.0789	0.039		SPLEEN	THYROID GLANDS	THYMUS	TRACHEA
PITUITARY	0.0142	0.007		URINARY BLADDER	UTERUS	VAGINA	CERVIX
THYROIDS/PARATHY	0.0205	0.010		LN, AXILLARY	SKIN, TREATED	SKIN, UNTREATED	
FINAL BODY WT (G)	201.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 14

ANIMAL NO. 90233 GROUP 3: 100 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	KIDNEYS	GROSS: AREA(S), DEPRESSED				P
BRAIN	1.81	1.034		FEW, PINPOINT, IN CORTEX, RIGHT				
LIVER	6.72	3.840	STOMACH	GROSS: AREA(S), DARK RED				P
KIDNEYS	1.94	1.109		ONE, IRREGULARLY SHAPED, GLANDULAR PORTION				
HEART	0.80	0.457	NO SIGNIFICANT					
SPLEEN	0.33	0.189	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
UTERUS	0.34	0.194		JOINT	BRAIN	CECUM	COLON	
OVARIES/OVIDUCTS	0.0965	0.055		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
THYMUS	0.3331	0.190		HEART	ILEUM	JEJUNUM	LAC. GLAND EXOR	
ADRENAL GLANDS	0.0809	0.046		LIVER	LN, MESENTERIC	LUNGS	MAMMARY GLAND	
PITUITARY	0.0126	0.007		NERVE, SCIATIC	OVIDUCTS	OVARIES	PANCREAS	
THYROIDS/PARATHY	0.0254	0.015		PITUITARY	RECTUM	SPINAL CORD	SAL. GLAND MAND	
FINAL BODY WT (G)	175.			SKELETAL MUSCLE	SKIN	SPLEEN	THYROID GLANDS	
				THYMUS	TRACHEA	URINARY BLADDER	UTERUS	
				VAGINA	CERVIX	LN, AXILLARY	SKIN, TREATED	
				SKIN, UNTREATED				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 15

ANIMAL NO. 90236 GROUP 4: 300 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS. (G)	REL.	NO SIGNIFICANT				
BRAIN	1.90	0.945	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR
LIVER	7.27	3.617		JOINT	BRAIN	CECUM	COLON
KIDNEYS	1.89	0.940		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	0.77	0.383		HEART	ILEUM	JEJUNUM	KIDNEYS
SPLEEN	0.40	0.199		LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS
UTERUS	0.54	0.269		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES
OVARIES/OVIDUCTS	0.1181	0.059		PANCREAS	PITUITARY	RECTUM	SPINAL CORD
THYMUS	0.3800	0.189		SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SKIN
ADRENAL GLANDS	0.0746	0.037		SPLEEN	THYROID GLANDS	THYMUS	TRACHEA
PITUITARY	0.0117	0.006		URINARY BLADDER	UTERUS	VAGINA	CERVIX
THYROIDS/PARATHY	0.0152	0.008		LN, AXILLARY	SKIN, TREATED	SKIN, UNTREATED	
FINAL BODY WT (G)	201.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A11 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL MACROSCOPIC FINDINGS

PAGE 16

ANIMAL NO. 90241 GROUP 4: 300 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14
GRADE

ORGAN WEIGHT	ABS.(G)	REL.	UTERUS	GROSS: CONTENTS, CLEAR FLUID				
BRAIN	1.73	0.911		BOTH HORNS				P
LIVER	7.99	4.205	LN, AXILLARY	GROSS: ENLARGED				P
KIDNEYS	1.80	0.947		LEFT				
HEART	0.85	0.447	NO SIGNIFICANT					
SPLEEN	0.44	0.232	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	AORTA	STERNUM	FEMUR	
UTERUS	0.52	0.274		JOINT	BRAIN	CECUM	COLON	
OVARIES/OVIDUCTS	0.1172	0.062		DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC	
THYMUS	0.3274	0.172		HEART	ILEUM	JEJUNUM	KIDNEYS	
ADRENAL GLANDS	0.0727	0.038		LAC. GLAND EXOR	LIVER	LN, MESENTERIC	LUNGS	
PITUITARY	0.0138	0.007		MAMMARY GLAND	NERVE, SCIATIC	OVIDUCTS	OVARIES	
THYROIDS/PARATHY	0.0129	0.007		PANCREAS	PITUITARY	RECTUM	SPINAL CORD	
FINAL BODY WT(G)	190.			SAL. GLAND MAND	STOMACH	SKELETAL MUSCLE	SKIN	
				SPLEEN	THYROID GLANDS	THYMUS	TRACHEA	
				URINARY BLADDER	VAGINA	CERVIX	SKIN, TREATED	
				SKIN, UNTREATED				

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

PGRHv4.64
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 1

MALE GROUP: UNTREATED							
ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90216	270.	2.01	10.85	2.58	1.32	0.59	0.58
90225	302.	1.91	10.97	3.09	1.26	0.59	0.70
MEAN	286.	1.96	10.91	2.84	1.29	0.59	0.64
S.D.	22.6	0.071	0.085	0.361	0.042	0.000	0.085
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 2

MALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90222	277.	1.90	10.89	3.02	1.22	0.50	0.35
90224	277.	1.98	11.28	2.84	1.23	0.82	0.50
MEAN	277.	1.94	11.09	2.93	1.23	0.66	0.43
S.D.	0.0	0.057	0.276	0.127	0.007	0.226	0.106
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 3

MALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90214	273.	1.94	10.32	2.81	1.15	0.64	0.54
90217	294.	1.98	11.55	3.01	1.29	0.64	0.60
MEAN	284.	1.96	10.94	2.91	1.22	0.64	0.57
S.D.	14.8	0.028	0.870	0.141	0.099	0.000	0.042
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 4

MALE GROUP: 300 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90218	291.	1.94	10.41	2.96	1.28	0.67	0.45
90220	251.	2.08	9.30	2.90	0.99	0.49	0.46
MEAN	271.	2.01	9.86	2.93	1.14	0.58	0.46
S.D.	28.3	0.099	0.785	0.042	0.205	0.127	0.007
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: UNTREATED						
ANIMAL	TESTES	EPIDIDYMIDES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDSPARATHY
90216	3.39	0.77	0.4727	0.0579	0.0096	0.0253
90225	3.05	0.78	0.4005	0.0769	0.0117	0.0254
MEAN	3.22	0.78	0.4366	0.0674	0.0107	0.0254
S.D.	0.240	0.007	0.05105	0.01344	0.00148	0.00007
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 6

MALE GROUP: 0 MG/KG/DAY

ANIMAL	TESTES	EPIDID YMIDES	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90222	2.96	0.82	0.4141	0.0627	0.0114	0.0187
90224	3.24	0.69	0.4246	0.0670	0.0106	0.0189
MEAN	3.10	0.76	0.4194	0.0649	0.0110	0.0188
S.D.	0.198	0.092	0.00743	0.00304	0.00057	0.00014
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 7

MALE GROUP: 100 MG/KG/DAY

ANIMAL	TESTES	EPIDID YMIDES	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90214	3.32	0.76	0.2485	0.0471	0.0097	0.0196
90217	3.43	0.92	0.4579	0.0863	0.0133	0.0217
MEAN	3.38	0.84	0.3532	0.0667	0.0115	0.0207
S.D.	0.078	0.113	0.14807	0.02772	0.00255	0.00148
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 8

MALE GROUP: 300 MG/KG/DAY

ANIMAL	TESTES	EPIDID YMIDES	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90218	3.22	0.72	0.5573	0.0543	0.0115	0.0260
90220	2.70	0.68	0.3514	0.0569	0.0109	0.0193
MEAN	2.96	0.70	0.4544	0.0556	0.0112	0.0227
S.D.	0.368	0.028	0.14559	0.00184	0.00042	0.00474
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 9

FEMALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90237	190.	1.82	7.85	1.92	0.83	0.38
90240	187.	1.87	7.79	2.13	0.85	0.46
MEAN	189.	1.85	7.82	2.03	0.84	0.42
S.D.	2.1	0.035	0.042	0.148	0.014	0.057
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 10

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90235	172.	1.90	5.42	1.72	0.73	0.28
90239	177.	1.75	6.43	2.01	0.73	0.36
MEAN	175.	1.83	5.93	1.87	0.73	0.32
S.D.	3.5	0.106	0.714	0.205	0.000	0.057
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 11

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90228	201.	2.02	7.24	1.88	0.80	0.40
90233	175.	1.81	6.72	1.94	0.80	0.33
MEAN	188.	1.92	6.98	1.91	0.80	0.37
S.D.	18.4	0.148	0.368	0.042	0.000	0.049
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 12

FEMALE GROUP: 300 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90236	201.	1.90	7.27	1.89	0.77	0.40
90241	190.	1.73	7.99	1.80	0.85	0.44
MEAN	196.	1.82	7.63	1.85	0.81	0.42
S.D.	7.8	0.120	0.509	0.064	0.057	0.028
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 13

FEMALE GROUP: UNTREATED						
ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90237	0.61	0.1248	0.2763	0.0765	0.0116	0.0234
90240	0.90	0.1184	0.3010	0.0603	0.0145	0.0235
MEAN	0.76	0.1216	0.2887	0.0684	0.0131	0.0235
S.D.	0.205	0.00453	0.01747	0.01146	0.00205	0.00007
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 14

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90235	0.46	0.1339	0.2602	0.0821	0.0142	0.0245
90239	0.38	0.1117	0.3937	0.0719	0.0104	0.0220
MEAN	0.42	0.1228	0.3270	0.0770	0.0123	0.0233
S.D.	0.057	0.01570	0.09440	0.00721	0.00269	0.00177
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 15

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90228	0.35	0.1270	0.3170	0.0789	0.0142	0.0205
90233	0.34	0.0965	0.3331	0.0809	0.0126	0.0254
MEAN	0.35	0.1118	0.3251	0.0799	0.0134	0.0230
S.D.	0.007	0.02157	0.01138	0.00141	0.00113	0.00346
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A12 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

PAGE 16

FEMALE GROUP: 300 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90236	0.54	0.1181	0.3800	0.0746	0.0117	0.0152
90241	0.52	0.1172	0.3274	0.0727	0.0138	0.0129
MEAN	0.53	0.1177	0.3537	0.0737	0.0128	0.0141
S.D.	0.014	0.00064	0.03719	0.00134	0.00148	0.00163
N	2	2	2	2	2	2

POFBWv4.25
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 1

MALE GROUP: UNTREATED							
ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90216	270.	0.744	4.019	0.956	0.489	0.219	0.215
90225	302.	0.632	3.632	1.023	0.417	0.195	0.232
MEAN	286.	0.690	3.830	0.990	0.450	0.210	0.220
S.D.	22.6	0.0792	0.2730	0.0478	0.0507	0.0164	0.0120
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 2

MALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90222	277.	0.686	3.931	1.090	0.440	0.181	0.126
90224	277.	0.715	4.072	1.025	0.444	0.296	0.181
MEAN	277.	0.700	4.000	1.060	0.440	0.240	0.150
S.D.	0.0	0.0204	0.0996	0.0459	0.0026	0.0817	0.0383
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 3

MALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90214	273.	0.711	3.780	1.029	0.421	0.234	0.198
90217	294.	0.673	3.929	1.024	0.439	0.218	0.204
MEAN	284.	0.690	3.850	1.030	0.430	0.230	0.200
S.D.	14.8	0.0263	0.1049	0.0039	0.0124	0.0118	0.0044
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 4

MALE GROUP: 300 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90218	291.	0.667	3.577	1.017	0.440	0.230	0.155
90220	251.	0.829	3.705	1.155	0.394	0.195	0.183
MEAN	271.	0.750	3.640	1.090	0.420	0.210	0.170
S.D.	28.3	0.1146	0.0904	0.0977	0.0321	0.0248	0.0202
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: UNTREATED						
ANIMAL	TESTES	EPIDIDYMIDES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDSPARATHY
90216	1.256	0.285	0.175	0.021	0.004	0.009
90225	1.010	0.258	0.133	0.025	0.004	0.008
MEAN	1.130	0.270	0.154	0.023	0.004	0.009
S.D.	0.1737	0.0190	0.0300	0.0028	0.0002	0.0007
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 6

MALE GROUP: 0 MG/KG/DAY

ANIMAL	TESTES	EPIDID YMIDES	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90222	1.069	0.296	0.149	0.023	0.004	0.007
90224	1.170	0.249	0.153	0.024	0.004	0.007
MEAN	1.120	0.270	0.151	0.023	0.004	0.007
S.D.	0.0715	0.0332	0.0027	0.0011	0.0002	0.0000
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 7

MALE GROUP: 100 MG/KG/DAY

ANIMAL	TESTES	EPIDID YMIDES	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90214	1.216	0.278	0.091	0.017	0.004	0.007
90217	1.167	0.313	0.156	0.029	0.005	0.007
MEAN	1.190	0.300	0.123	0.023	0.004	0.007
S.D.	0.0350	0.0244	0.0458	0.0086	0.0007	0.0001
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 8

MALE GROUP: 300 MG/KG/DAY						
ANIMAL	TESTES	EPIDIDYMIDES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDSPARATHY
90218	1.107	0.247	0.192	0.019	0.004	0.009
90220	1.076	0.271	0.140	0.023	0.004	0.008
MEAN	1.090	0.260	0.166	0.021	0.004	0.008
S.D.	0.0218	0.0166	0.0364	0.0028	0.0003	0.0008
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 9

FEMALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90237	190.	0.958	4.132	1.011	0.437	0.200
90240	187.	1.000	4.166	1.139	0.455	0.246
MEAN	189.	0.980	4.150	1.070	0.450	0.220
S.D.	2.1	0.0298	0.0242	0.0909	0.0125	0.0325
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 10

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90235	172.	1.105	3.151	1.000	0.424	0.163
90239	177.	0.989	3.633	1.136	0.412	0.203
MEAN	175.	1.050	3.390	1.070	0.420	0.180
S.D.	3.5	0.0820	0.3405	0.0959	0.0085	0.0287
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 11

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90228	201.	1.005	3.602	0.935	0.398	0.199
90233	175.	1.034	3.840	1.109	0.457	0.189
MEAN	188.	1.020	3.720	1.020	0.430	0.190
S.D.	18.4	0.0207	0.1683	0.1225	0.0418	0.0074
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 12

FEMALE GROUP: 300 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN
90236	201.	0.945	3.617	0.940	0.383	0.199
90241	190.	0.911	4.205	0.947	0.447	0.232
MEAN	196.	0.930	3.910	0.940	0.420	0.220
S.D.	7.8	0.0246	0.4160	0.0050	0.0455	0.0230
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 13

FEMALE GROUP: UNTREATED						
ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90237	0.321	0.066	0.145	0.040	0.006	0.012
90240	0.481	0.063	0.161	0.032	0.008	0.013
MEAN	0.400	0.064	0.153	0.036	0.007	0.013
S.D.	0.1133	0.0017	0.0110	0.0057	0.0012	0.0002
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 14

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90235	0.267	0.078	0.151	0.048	0.008	0.014
90239	0.215	0.063	0.222	0.041	0.006	0.012
MEAN	0.240	0.071	0.187	0.044	0.007	0.013
S.D.	0.0373	0.0104	0.0503	0.0050	0.0017	0.0013
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 15

FEMALE GROUP: 100 MG/KG/DAY						
ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90228	0.174	0.063	0.158	0.039	0.007	0.010
90233	0.194	0.055	0.190	0.046	0.007	0.014
MEAN	0.180	0.059	0.174	0.043	0.007	0.012
S.D.	0.0143	0.0057	0.0231	0.0049	0.0001	0.0030
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A13 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

PAGE 16

FEMALE GROUP: 300 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90236	0.269	0.059	0.189	0.037	0.006	0.008
90241	0.274	0.062	0.172	0.038	0.007	0.007
MEAN	0.270	0.060	0.181	0.038	0.007	0.007
S.D.	0.0036	0.0021	0.0118	0.0008	0.0010	0.0006
N	2	2	2	2	2	2

POFBWv4.25
12/30/2010

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 1

MALE GROUP: UNTREATED							
ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90216	270.	2.01	539.801	128.358	65.672	29.353	28.856
90225	302.	1.91	574.346	161.780	65.969	30.890	36.649
MEAN	286.	1.96	557.070	145.070	65.820	30.120	32.750
S.D.	22.6	0.071	24.4268	23.6329	0.2104	1.0867	5.5108
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 2

MALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90222	277.	1.90	573.158	158.947	64.211	26.316	18.421
90224	277.	1.98	569.697	143.434	62.121	41.414	25.253
MEAN	277.	1.94	571.430	151.190	63.170	33.860	21.840
S.D.	0.0	0.057	2.4439	10.9694	1.4774	10.6761	4.8306
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 3

MALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90214	273.	1.94	531.959	144.845	59.278	32.990	27.835
90217	294.	1.98	583.333	152.020	65.152	32.323	30.303
MEAN	284.	1.96	557.650	148.430	62.210	32.660	29.070
S.D.	14.8	0.028	36.3271	5.0734	4.1530	0.4713	1.7451
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 4

MALE GROUP: 300 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN	PROS TATE
90218	291.	1.94	536.598	152.577	65.979	34.536	23.196
90220	251.	2.08	447.115	139.423	47.596	23.558	22.115
MEAN	271.	2.01	491.860	146.000	56.790	29.050	22.660
S.D.	28.3	0.099	63.2738	9.3014	12.9989	7.7629	0.7640
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 5

MALE GROUP: UNTREATED

ANIMAL	TESTES	EPIDID YMIDES	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90216	168.657	38.308	23.517	2.881	0.478	1.259
90225	159.686	40.838	20.969	4.026	0.613	1.330
MEAN	164.170	39.570	22.243	3.453	0.545	1.294
S.D.	6.3433	1.7884	1.8023	0.8100	0.0954	0.0503
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 6

MALE GROUP: 0 MG/KG/DAY						
ANIMAL	TESTES	EPIDIDYMIDES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDSPARATHY
90222	155.789	43.158	21.795	3.300	0.600	0.984
90224	163.636	34.848	21.444	3.384	0.535	0.955
MEAN	159.710	39.000	21.620	3.342	0.568	0.969
S.D.	5.5487	5.8756	0.2477	0.0593	0.0457	0.0210
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 7

MALE GROUP: 100 MG/KG/DAY						
ANIMAL	TESTES	EPIDIDYMIDES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDSPARATHY
90214	171.134	39.175	12.809	2.428	0.500	1.010
90217	173.232	46.465	23.126	4.359	0.672	1.096
MEAN	172.180	42.820	17.968	3.393	0.586	1.053
S.D.	1.4833	5.1544	7.2952	1.3652	0.1214	0.0606
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 8

MALE GROUP: 300 MG/KG/DAY

ANIMAL	TESTES	EPIDID YMIDES	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90218	165.979	37.113	28.727	2.799	0.593	1.340
90220	129.808	32.692	16.894	2.736	0.524	0.928
MEAN	147.890	34.900	22.810	2.767	0.558	1.134
S.D.	25.5772	3.1262	8.3669	0.0448	0.0486	0.2915
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 9

FEMALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN
90237	190.	1.82	431.319	105.494	45.604	20.879
90240	187.	1.87	416.578	113.904	45.455	24.599
MEAN	189.	1.85	423.950	109.700	45.530	22.740
S.D.	2.1	0.035	10.4235	5.9463	0.1065	2.6303
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 10

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN
90235	172.	1.90	285.263	90.526	38.421	14.737
90239	177.	1.75	367.429	114.857	41.714	20.571
MEAN	175.	1.83	326.350	102.690	40.070	17.650
S.D.	3.5	0.106	58.0997	17.2045	2.3287	4.1257
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 11

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN
90228	201.	2.02	358.416	93.069	39.604	19.802
90233	175.	1.81	371.271	107.182	44.199	18.232
MEAN	188.	1.92	364.840	100.130	41.900	19.020
S.D.	18.4	0.148	9.0899	9.9795	3.2491	1.1101
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 12

FEMALE GROUP: 300 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	HEART	SPLEEN
90236	201.	1.90	382.632	99.474	40.526	21.053
90241	190.	1.73	461.850	104.046	49.133	25.434
MEAN	196.	1.82	422.240	101.760	44.830	23.240
S.D.	7.8	0.120	56.0156	3.2334	6.0858	3.0978
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 13

FEMALE GROUP: UNTREATED						
ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90237	33.516	6.857	15.181	4.203	0.637	1.286
90240	48.128	6.332	16.096	3.225	0.775	1.257
MEAN	40.820	6.594	15.639	3.714	0.706	1.271
S.D.	10.3321	0.3716	0.6470	0.6920	0.0976	0.0205
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 14

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90235	24.211	7.047	13.695	4.321	0.747	1.289
90239	21.714	6.383	22.497	4.109	0.594	1.257
MEAN	22.960	6.715	18.096	4.215	0.671	1.273
S.D.	1.7651	0.4699	6.2242	0.1502	0.1082	0.0229
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 15

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDES /PARATHY
90228	17.327	6.287	15.693	3.906	0.703	1.015
90233	18.785	5.331	18.403	4.470	0.696	1.403
MEAN	18.060	5.809	17.048	4.188	0.700	1.209
S.D.	1.0308	0.6757	1.9164	0.3986	0.0048	0.2746
N	2	2	2	2	2	2

PROJECT NO.:WIL-402021
SPONSOR:AMERICAN PETROLEUM

TABLE A14 (SCHEDULED NECROPSY)
14-DAY RAT DERMAL STUDY OF PETROLEUM PRODUCTS, DIESEL OIL
INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

PAGE 16

FEMALE GROUP: 300 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90236	28.421	6.216	20.000	3.926	0.616	0.800
90241	30.058	6.775	18.925	4.202	0.798	0.746
MEAN	29.240	6.495	19.462	4.064	0.707	0.773
S.D.	1.1574	0.3951	0.7602	0.1952	0.1286	0.0384
N	2	2	2	2	2	2

POFBWv4.25
12/30/2010