FINAL REPORT

Contents:	Text, Summary Tables, and Appendices A - F
Study Title:	A 14-Day Dose Range Finding Dermal Toxicity Study Utilizing Clarified Oils, Catalytic Cracked in Sprague Dawley Rats
Study Number:	WIL-402019
Study Director:	Teresa D. Morris, BS
Data Requirements:	Not Applicable
Study Initiation Date:	2 December 2010
Study Completion Date:	15 January 2013
Performing Laboratory:	WIL Research Laboratories, LLC 1407 George Road Ashland, OH 44805-8946
Sponsor Number:	Not Applicable
Sponsor:	American Petroleum Institute 1220 L Street, NW Washington, DC 20005

COMPLIANCE STATEMENT

This non-GLP study, designated WIL-402019, 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.

Teresa D. Morris, BS
Senior Toxicologist, General Toxicology
Study Director

15 Jan 2013
Date

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1. SUMMARY

1.1. OBJECTIVE

The objectives of this study were to evaluate the potential irritative and toxicity effects of repeated exposure of clarified oils, catalytic cracked 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

Clarified oils, catalytic cracked (CAS No. 64741-62-4) in the vehicle, acetone, was administered by once daily dermal application for 14 consecutive days to 3 groups (Groups 3-5) of Crl:CD(SD) rats. Once weekly (on study days 6 and 13) the test site was gently patted in an effort to remove the residual test substance. All animals were collared continuously during the 14-day dosing period. Dosage levels were 5, 25, and 100 mg/kg/day for Groups 3, 4, and 5, respectively. A concurrent vehicle control group (Group 2) received the vehicle on a comparable regimen. The dose volume was 1.5 mL/kg for Groups 2-5. A concurrent sham control group (Group 1) was subjected to the same procedures (*i.e.*, shaving, collaring, sham dosing with glass rod, and weekly wiping) as the test substance-treated groups; however, no vehicle was applied to these animals. Each group (Groups 1-5) consisted of 2 animals/sex. Following 14 days of dose administration, all animals were euthanized (study day 14).

All animals were observed twice daily for mortality and moribundity. Clinical and dermal observations were recorded daily, and detailed physical examinations were performed weekly. Individual body weights and food consumption were recorded approximately weekly. Complete necropsies were conducted on all animals, and selected organs were weighed at the scheduled necropsy (study day 14).

1.3. RESULTS

All animals survived to the scheduled necropsy. There were no test substance-related clinical or dermal observations or macroscopic findings. There were no test substance-related effects on food consumption.

Test substance-related lower body weights were noted in the 25 and 100 mg/kg/day group females.

Test substance-related higher liver weights were noted in the 25 and 100 mg/kg/day group males and 100 mg/kg/day group females, and lower thymus weights were noted in the 25 and 100 mg/kg/day group females.

1.4. CONCLUSIONS

Based on the results of this study, dermal administration of clarified oils, catalytic cracked 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 5, 25, and 100 mg/kg/day resulted in nonadverse lower body weights and thymus weights in the 25 and 100 mg/kg/day group females, and higher liver weights in the 25 and 100 mg/kg/day group males and 100 mg/kg/day group females. The maximum tolerated dose (MTD) was determined to be 100 mg/kg/day.

2. INTRODUCTION

The objectives of this study were to evaluate the potential irritative and toxicity effects of repeated exposure of clarified oils, catalytic cracked 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 Clarified Oils, Catalytic Cracked in Sprague Dawley Rats." Due to software spacing constraints, the study title appears as "14-Day Rat Dermal Study of Clarified Oils, Catalytic Cracked" on the report tables. The study protocol and deviation 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:

Computer Protocol	Type of Data Collected
WIL-402019M	Main study data
WIL-402019P	Pretest data
WIL-402019V	Unscheduled dermal observations

2.2. KEY STUDY DATES

Date(s)	Event(s)
23 November 2010	Animal receipt
2 December 2010	Assignment to study groups
3 December 2010	Initiation of dose administration (study day 0)
17 December 2010	Scheduled necropsy (study day 14)

2.3. WIL RESEARCH KEY STUDY PERSONNEL

Susan C. Haley, BS	Operations Manager, Pathology
Sally A. Keets, AS	Senior Operations Manager, Vivarium
Carol A. Kopp, BS, LAT	Manager, Gross Pathology and Developmental Toxicology Laboratory
Erica L. Lashley, BS, LAT	Operations Manager, Toxicology
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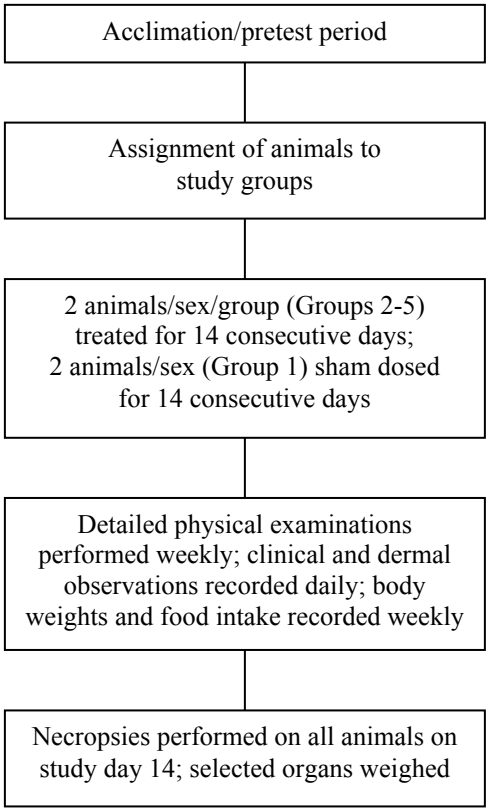
Bennett J. Varsho, MPH, DABT	Director, Operations
Robert A. Wally, BS	Operations Manager, Reporting & Technical Support Services

3. STUDY DESIGN



4. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

4.1. TEST SUBSTANCE AND VEHICLE

4.1.1. TEST SUBSTANCE

The test substance, clarified oils, catalytic cracked, was received from EPL Archives, Inc., Sterling, VA, on behalf of American Petroleum Institute, on 10 November 2010, as follows:

Identification	Physical Description
Clarified oils, catalytic cracked (CAS# 64741-62-4; Site# 12, Sample# 2) [WIL log no. 8473A]	Very viscous, dark brown liquid

Documentation regarding the purity and stability of the test substance is on file with the Sponsor. 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 and for administration to the vehicle control group was acetone (lot nos. ZM0550, XP3044, ZE0696, and ZP3044; exp. dates: 28 December 2011, 19 February 2012, 31 March 2012, and 19 February 2012; manufactured by Spectrum Chemical Manufacturing Corporation, New Brunswick, NJ).

4.1.3. PREPARATION

For the vehicle control group (Group 2), a sufficient amount of acetone was dispensed into a labeled glass storage container. The vehicle was dispensed 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]	5	3.3
4	Test Substance [a]	25	16.6
5	Test Substance [a]	100	66.6

NA = Not Applicable
[a] = The test substance for this study was clarified oils, catalytic cracked

The test substance formulations were weight/volume (test substance/vehicle) mixtures. 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 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 utilized because it is a widely used strain for which 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.

Crl:CD(SD) rats (11 males and 11 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 10-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. 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:

Study Day	Approximate Acclimation Period (Hours)
-6	1
-5	2
-4	4
-3	8
-2	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 LabDiet® 5002 (pellet), 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, except during the period of fasting prior to necropsy when food, but not water, was withheld. 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 ± 5°F (22 ± 3°C) and 50 ± 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. Actual mean daily temperature ranged from 70.3°F to 70.7°F (21.3°C to 21.5°C) and mean daily relative humidity ranged from 42.3% to 48.8% 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), 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 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 according to the printout. Individual body weights at randomization were within ± 20% of the mean for each sex. Animals not assigned to study were euthanized by carbon dioxide inhalation and discarded.

Each group (Groups 1-5) consisted of 2 males and 2 females. The animals were approximately 8 weeks old at the initiation of dose administration. Individual body weights ranged from 222 g to 282 g for males and from 176 g to 198 g for females at randomization.

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 1-5) were fitted with Elizabethan collars during the dosing period. On study days 6 and 13, the test site of each animal was gently patted using a disposable paper towel according to WIL SOPs.

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 each animal. The actual surface area of coverage was calculated for each animal as follows:

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

Where:

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

The mean area of coverage was 10% for males and females in the test substance-treated groups.

The following table presents the approximate percentages of body surface area covered by the test substance for each group/week/sex.

Percent Coverage (%)

	Males					Females				
Group	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Dosage Level (mg/kg/day)	**NA**	**0**	**5**	**25**	**100**	**NA**	**0**	**5**	**25**	**100**
Study Week 0	10.1	10.2	10.3	10.2	10.5	10.2	10.1	10.1	10.3	10.4
Study Week 1	10.3	10.3	10.3	10.2	10.5	9.9	10.4	10.3	10.3	10.6
Mean Coverage	**10.2**	**10.2**	**10.3**	**10.2**	**10.5**	**10.1**	**10.3**	**10.2**	**10.3**	**10.5**
Standard Deviation	0.2	0.3	0.4	0.2	0.5	0.3	0.4	0.2	0.1	0.5

NA = Not Applicable

The dose volume for the test substance-treated group 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 first week of dosing was study week 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]	5	1.5	2	2
4	Test Substance [a]	25	1.5	2	2
5	Test Substance [a]	100	1.5	2	2

NA = Not Applicable

[a] = The test substance for this study is clarified oils, catalytic cracked.

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.

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 pretest period, approximately weekly during the study, and prior to the scheduled necropsy.

5.3. DERMAL OBSERVATIONS

The application sites were scored weekly (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 D. 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 E.

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 throughout the study. 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, beginning during the pretest period, for the duration of 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. The following tissues and organs were collected and placed in 10% neutral-buffered formalin (except as noted):

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

[a] = Bone marrow smears were obtained at the scheduled necropsy, but not placed in formalin; slides were examined only if scientifically warranted.
[b] = Fixed in Bouin's solution
[c] = Fixed in Davidson's solution
[d] = For females only.

5.6.2. ORGAN WEIGHTS

The following organs were weighed from all animals 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.

Organ to final body weight and organ to brain weight ratios were calculated.

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 (*e.g.*, lab books, study data, wet tissues, slides, *etc.*).
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.
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.
WIL Toxicology Data Management System™ (WTDMS™)	In-house developed system used for collection and reporting of in-life and *postmortem* data.

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

5.7.2. 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

Individual Data: Table A1

All animals survived to the scheduled necropsy.

6.2. CLINICAL OBSERVATIONS

Summary Data: Table S2, Table S3

Individual Data: Table A2, Table A3, Table A4

There were no test substance-related clinical observations. All clinical findings in the test substance-treated groups were noted with similar incidence in the vehicle control and/or sham control groups, 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

Individual Data: Table A5; Appendix E

There were no test substance-related effects noted during the dermal observations. Residual test substance was noted within the test site for the 5, 25, and 100 mg/kg/day group males and females.

6.4. BODY WEIGHTS

Summary Data: Table S5, Table S6, Table S7

Individual Data: Table A6, Table A7, Table A8

Test substance-related effects on body weights were noted in the 25 and 100 mg/kg/day group females. Body weights were unaffected by test substance administration in males.

Lower body weight gains or slight body weight losses were observed primarily from study day 0 to 7 in the 25 and 100 mg/kg/day group females. On study day 7, body

weights for the 25 and 100 mg/kg/day group females were 9.1% and 5.3% lower, respectively, than the sham control group. Lower cumulative body weights were noted through study day 0 to 13.

6.5. FOOD CONSUMPTION

Summary Data: Table S8

Individual Data: Table A9

Food consumption was unaffected by test substance administration.

6.6. ANATOMIC PATHOLOGY

6.6.1. MACROSCOPIC EXAMINATION

Summary Data: Table S9

Individual Data: Table A10

There were no test substance-related macroscopic findings at the scheduled necropsy. All 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 S10

Individual Data: Table A11, Table A12, Table A13

Test substance-related higher liver weights were noted in the 25 and 100 mg/kg/day group males and 100 mg/kg/day group females, and lower thymus weights were noted in the 25 and 100 mg/kg/day group females.

Higher mean liver weights (absolute and relative to body and brain weights) were noted in the 100 mg/kg/day group females when compared to the sham control group. Absolute liver weights were 42.3% higher than the sham control group and fell outside of ± 2 SD in the WIL Research historical control data. In addition, higher mean liver weights (absolute and relative to body and brain weights) were noted in the 25 and 100 mg/kg/day

group males when compared to the sham control group, although absolute weight values fell within ± 2 SD of the WIL historical control data. Absolute liver weights in the 25 and 100 mg/kg/day group males were 20.1% and 28.8% higher, respectively, than the sham control group.

Lower mean thymus weights (absolute and relative to body and brain weights) were noted in the 25 and 100 mg/kg/day group females when compared to the sham control group. Absolute mean thymus weights in the 25 and 100 mg/kg/day group females were 33% and 59% lower, respectively, than the sham control group and fell outside of ± 2 SD in the WIL Research historical control data.

7. CONCLUSIONS

Based on the results of this study, dermal administration of clarified oils, catalytic cracked 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 5, 25, and 100 mg/kg/day resulted in nonadverse lower body weights and thymus weights in the 25 and 100 mg/kg/day group females, and higher liver weights in the 25 and 100 mg/kg/day group males and 100 mg/kg/day group females. The maximum tolerated dose (MTD) was determined to be 100 mg/kg/day.

8. REPORT REVIEW AND APPROVAL

Report Approved By:

Teresa D. Morris, BS
Senior Toxicologist, General Toxicology
Study Director

15 Jan 2013
Date

Report Prepared By:

Brittany D. Mancl, BS
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15 Jan 2013
Date

Report Reviewed By:

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Misty R. Lee, BA
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15 Jan 2013
Date

Thomas P. O'Neill, BS, DABT
Assistant Director, General Toxicology

15 JAN 2013
Date

9. QUALITY ASSURANCE STATEMENT

Date(s) of Inspection(s)	Phase Inspected	Date(s) Findings Reported to Study Director	Date(s) Findings Reported to Management
27-Dec-2010 28-Dec-2010 03-Jan-2011	Study Records (I-1), Table data only	03-Jan-2011	28-Feb-2011
29-Dec-2010 30-Dec-2010 03-Jan-2011	Study Records (N-1), Table data only	03-Jan-2011	28-Feb-2011
04-Jan-2011	Summary and Individual Data Tables	04-Jan-2011	28-Feb-2011
15-Jan-2013	Final Report (Summary and Individual Data Tables)	15-Jan-2013	15-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.

R. Kelvin Mentzer, BS, RQAP-GLP
Quality Assurance Representative

15 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. All 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:

µ	-	micro
AAALAC	-	Association for Assessment and Accreditation of Laboratory Animal Care
cm	-	centimeter
C_{max}	-	maximum measured concentration of the analyte in plasma
CEO	-	correlates with externally observed
dB	-	decibels
dL	-	deciliter
EPA	-	Environmental Protection Agency
etc.	-	et cetera
FDA	-	Food and Drug Administration
g	-	gram
GLP	-	Good Laboratory Practices
hr	-	hour(s)
kg	-	kilogram
L	-	liter
M	-	molar
mg	-	milligram
mL	-	milliliter
mm	-	millimeter
ms	-	milliseconds
mM	-	millimolar
NA	-	not applicable
OECD	-	Organisation for Economic Cooperation and Development
ppm	-	parts per million
RSD	-	Relative standard deviation
SOP	-	standard operating procedure
T_{max}	-	Sampling time at which C_{max} was achieved
WIL Research	-	WIL Research Laboratories, LLC
WTDMS™	-	WIL Toxicology Data Management System

TABLES S1 - S10

TABLE S1

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SURVIVAL AND DISPOSITION

MALES

GROUP :	1				2				3				4				5			
DAY	LIVE	FD	EE	SE	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	2	0	0	0
1	2	0	0	0	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	2	0	0	0
3	2	0	0	0	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	2	0	0	0
5	2	0	0	0	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	2	0	0	0
7	2	0	0	0	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	2	0	0	0
9	2	0	0	0	2	0	0	0	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	2	0	0	0	2	0	0	0
11	2	0	0	0	2	0	0	0	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	2	0	0	0	2	0	0	0
13	2	0	0	0	2	0	0	0	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	0	0	0	2	0	0	0	2

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

TABLE S1

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM SUMMARY OF SURVIVAL AND DISPOSITION

FEMALES

GROUP :	1				2				3				4				5			
DAY	LIVE	FD	EE	SE	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	2	0	0	0
1	2	0	0	0	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	2	0	0	0
3	2	0	0	0	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	2	0	0	0
5	2	0	0	0	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	2	0	0	0
7	2	0	0	0	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	2	0	0	0
9	2	0	0	0	2	0	0	0	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	2	0	0	0	2	0	0	0
11	2	0	0	0	2	0	0	0	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	2	0	0	0	2	0	0	0
13	2	0	0	0	2	0	0	0	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	0	0	0	2	0	0	0	2

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

TABLE S2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)

PROJECT NO.:WIL-402019M — 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED — PAGE 1

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

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

TABLE RANGE:	DAY 000 TO DAY 014				
GROUP:	1	2	3	4	5
NORMAL					
-NO SIGNIFICANT CLINICAL OBSERVATIONS	4/ 2	4/ 2	2/ 2	2/ 2	2/ 2
DISPOSITION					
-PRIMARY NECROPSY (DAY 14)	2/ 2	2/ 2	2/ 2	2/ 2	2/ 2
BODY/INTEGUMENT					
-DRIED YELLOW MATERIAL UROGENITAL AREA	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0
EYES/EARS/NOSE					
-DRIED RED MATERIAL AROUND NOSE	2/ 2	2/ 2	2/ 2	1/ 1	1/ 1
-DRIED RED MATERIAL AROUND RIGHT EYE	1/ 1	2/ 2	0/ 0	0/ 0	1/ 1
-DRIED RED MATERIAL AROUND LEFT EYE	1/ 1	2/ 2	0/ 0	1/ 1	0/ 0
BODY/INTEG II					
-SCABBING VENTRAL NECK	0/ 0	0/ 0	2/ 2	0/ 0	0/ 0
SPECIAL					
-SWOLLEN FACIAL AREA	0/ 0	1/ 1	1/ 1	2/ 2	0/ 0

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

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

TABLE RANGE:	DAY 000 TO DAY 014				
GROUP:	1	2	3	4	5
NORMAL					
-NO SIGNIFICANT CLINICAL OBSERVATIONS	4/ 2	4/ 2	4/ 2	2/ 2	2/ 2
DISPOSITION					
-PRIMARY NECROPSY (DAY 14)	2/ 2	2/ 2	2/ 2	2/ 2	2/ 2
EYES/EARS/NOSE					
-DRIED RED MATERIAL AROUND NOSE	2/ 2	1/ 1	1/ 1	2/ 2	3/ 2
-DRIED RED MATERIAL AROUND RIGHT EYE	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
-DRIED RED MATERIAL AROUND LEFT EYE	0/ 0	1/ 1	2/ 2	0/ 0	0/ 0
SPECIAL					
-SWOLLEN FACIAL AREA	0/ 0	0/ 0	1/ 1	0/ 0	1/ 1

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

TABLE S3 (DOSING DAY OBSERVATIONS)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

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

	----- M A L E -----				
TABLE RANGE:	DAY 0 TO DAY 13				
GROUP:	1	2	3	4	5
NORMAL					
TIME OF DOSE					
-NO SIGNIFICANT CLINICAL OBSERVATIONS	28/2	28/2	24/2	22/2	23/2
1-2 HOUR POST-DOSING					
-NO SIGNIFICANT CLINICAL OBSERVATIONS	28/2	28/2	28/2	26/2	26/2

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

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

TABLE RANGE: DAY 0 TO DAY 13					
GROUP:	1	2	3	4	5
NORMAL					
TIME OF DOSE					
-NO SIGNIFICANT CLINICAL OBSERVATIONS	28/2	28/2	24/2	23/2	22/2
1-2 HOUR POST-DOSING					
-NO SIGNIFICANT CLINICAL OBSERVATIONS	28/2	28/2	28/2	26/2	26/2

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

TABLE S4

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM SUMMARY OF DERMAL OBSERVATIONS: TOTAL OCCURRENCE/NO. OF ANIMALS

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

TABLE RANGE:	DAY 000 TO DAY 014				
GROUP:	1	2	3	4	5
DERMAL OBS					
-SCORED, NOT REMARKABLE	30/ 2	30/ 2	14/ 2	2/ 2	3/ 2
-NO ERYTHEMA	0/ 0	0/ 0	16/ 2	28/ 2	27/ 2
-NO EDEMA	0/ 0	0/ 0	16/ 2	28/ 2	27/ 2
-RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE	0/ 0	0/ 0	16/ 2	28/ 2	27/ 2

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

TABLE S4

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 2

SPONSOR:AMERICAN PETROLEUM SUMMARY OF DERMAL OBSERVATIONS: TOTAL OCCURRENCE/NO. OF ANIMALS

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

TABLE RANGE:	DAY 000 TO DAY 014				
GROUP:	1	2	3	4	5
DERMAL OBS					
-SCORED, NOT REMARKABLE	30/ 2	30/ 2	9/ 2	3/ 2	2/ 2
-NO ERYTHEMA	0/ 0	0/ 0	21/ 2	27/ 2	28/ 2
-NO EDEMA	0/ 0	0/ 0	21/ 2	27/ 2	28/ 2
-RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE	0/ 0	0/ 0	21/ 2	27/ 2	28/ 2

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

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TABLE S5

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM SUMMARY OF BODY WEIGHTS [G]

MALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY -7					
MEAN	218.	214.	230.	212.	216.
% DIFFERENCE		-1.8	5.5	-2.8	-0.9
S.D.	3.5	7.8	7.8	8.5	9.9
N	2	2	2	2	2
-1					
MEAN	249.	239.	267.	248.	257.
% DIFFERENCE		-4.0	7.2	-0.4	3.2
S.D.	14.8	23.3	21.9	4.2	27.6
N	2	2	2	2	2
0					
MEAN	271.	256.	284.	264.	269.
% DIFFERENCE		-5.5	4.8	-2.6	-0.7
S.D.	6.4	14.1	22.6	12.0	27.6
N	2	2	2	2	2
7					
MEAN	289.	268.	316.	283.	286.
% DIFFERENCE		-7.3	9.3	-2.1	-1.0
S.D.	13.4	14.8	17.7	9.9	19.8
N	2	2	2	2	2
13					
MEAN	318.	287.	347.	304.	304.
% DIFFERENCE		-9.7	9.1	-4.4	-4.4
S.D.	21.2	11.3	10.6	10.6	6.4
N	2	2	2	2	2

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY -7					
MEAN	181.	182.	171.	175.	179.
% DIFFERENCE		0.6	-5.5	-3.3	-1.1
S.D.	2.8	0.7	14.1	1.4	7.1
N	2	2	2	2	2
-1					
MEAN	189.	190.	192.	189.	184.
% DIFFERENCE		0.5	1.6	0.0	-2.6
S.D.	11.3	11.3	4.2	9.2	11.3
N	2	2	2	2	2
0					
MEAN	201.	203.	198.	193.	197.
% DIFFERENCE		1.0	-1.5	-4.0	-2.0
S.D.	7.8	7.1	2.8	3.5	13.4
N	2	2	2	2	2
7					
MEAN	209.	207.	211.	190.	198.
% DIFFERENCE		-1.0	1.0	-9.1	-5.3
S.D.	4.2	18.4	7.1	2.8	21.9
N	2	2	2	2	2
13					
MEAN	223.	220.	223.	203.	210.
% DIFFERENCE		-1.3	0.0	-9.0	-5.8
S.D.	1.4	17.0	0.7	3.5	24.7
N	2	2	2	2	2

TABLE S6

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

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

		MALES				
GROUP:		UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY -7 TO -1						
	MEAN	31.	25.	37.	36.	41.
	S.D.	11.3	15.6	14.1	12.7	17.7
	N	2	2	2	2	2
-1 TO 0						
	MEAN	22.	18.	18.	16.	12.
	S.D.	8.5	9.2	0.7	16.3	0.0
	N	2	2	2	2	2
0 TO 7						
	MEAN	18.	12.	32.	20.	18.
	S.D.	7.1	0.7	4.9	2.1	7.8
	N	2	2	2	2	2
7 TO 13						
	MEAN	30.	20.	31.	21.	18.
	S.D.	7.8	3.5	7.1	0.7	13.4
	N	2	2	2	2	2

FEMALES

GROUP:		UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY -7 TO -1						
	MEAN	8.	9.	21.	14.	5.
	S.D.	8.5	10.6	18.4	10.6	4.2
	N	2	2	2	2	2
-1 TO 0						
	MEAN	12.	13.	6.	4.	13.
	S.D.	3.5	4.2	1.4	5.7	2.1
	N	2	2	2	2	2
0 TO 7						
	MEAN	9.	4.	13.	-3.	1.
	S.D.	3.5	11.3	4.2	0.7	8.5
	N	2	2	2	2	2
7 TO 13						
	MEAN	14.	13.	12.	13.	12.
	S.D.	5.7	1.4	6.4	0.7	2.8
	N	2	2	2	2	2

TABLE S7

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

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

MALES

GROUP:		UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY 0 TO 7						
	MEAN	18.	12.	32.	20.	18.
	S.D.	7.1	0.7	4.9	2.1	7.8
	N	2	2	2	2	2
0 TO 13						
	MEAN	48.	31.	63.	40.	35.
	S.D.	14.8	2.8	12.0	1.4	21.2
	N	2	2	2	2	2

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY 0 TO 7					
MEAN	9.	4.	13.	-3.	1.
S.D.	3.5	11.3	4.2	0.7	8.5
N	2	2	2	2	2
0 TO 13					
MEAN	23.	17.	25.	10.	13.
S.D.	9.2	9.9	2.1	0.0	11.3
N	2	2	2	2	2

TABLE S8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

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

		MALES				
GROUP:		UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY -7 TO -1						
	MEAN	29.	26.	28.	30.	29.
	S.D.	2.8	2.1	3.5	1.4	6.4
	N	2	2	2	2	2
0 TO 7						
	MEAN	35.	27.	35.	32.	30.
	S.D.	2.8	2.8	1.4	1.4	4.2
	N	2	2	2	2	2
7 TO 13						
	MEAN	36.	33.	37.	33.	31.
	S.D.	1.4	0.7	1.4	0.0	1.4
	N	2	2	2	1	2

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
DAY -7 TO -1					
MEAN	22.	19.	24.	20.	20.
S.D.	1.4	0.0	1.4	2.1	2.1
N	2	2	2	2	2
0 TO 7					
MEAN	28.	23.	28.	24.	24.
S.D.	2.8	2.1	0.0	4.2	2.8
N	2	2	1	2	2
7 TO 13					
MEAN	30.	27.	28.	26.	26.
S.D.	0.0	0.0	0.0	0.0	3.5
N	1	2	1	1	2

TABLE S9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	M A L E				
GROUP:	1	2	3	4	5
NUMBER OF ANIMALS IN DOSE GROUP	2	2	2	2	2
NUMBER OF ANIMALS EXAMINED DAY 14	2	2	2	2	2
EPIDIDYMIDES					
-AREA(S), RAISED	0	0	1	0	0
KIDNEYS					
-AREA(S), DEPRESSED	0	0	1	0	0
LN, AXILLARY					
-ENLARGED	0	0	1	0	0
SKIN					
-SCABBING	0	0	2	0	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	2	2	0	2	2

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

SCHEDULED NECROPSY

	----- F E M A L E -----				
GROUP:	1	2	3	4	5
NUMBER OF ANIMALS IN DOSE GROUP	2	2	2	2	2
NUMBER OF ANIMALS EXAMINED DAY 14	2	2	2	2	2
ADRENAL GLANDS					
-AREA(S), DARK RED	0	0	0	0	1
KIDNEYS					
-AREA(S), DEPRESSED	0	0	1	0	0
-DILATED PELVIS	0	1	0	0	0
LN, MANDIBULAR					
-ENLARGED	0	0	0	0	1
URETERS					
-DISTENDED	0	1	0	0	0
UTERUS					
-CONTENTS, CLEAR FLUID	0	0	0	1	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	2	1	1	1	1

1- UNTREATED 2- 0 MG/KG/DAY 3- 5 MG/KG/DAY 4- 25 MG/KG/DAY 5- 100 MG/KG/DAY

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

MALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
FINAL BODY WT (G)					
MEAN	285.	258.	313.	269.	276.
% DIFFERENCE		-9.5	9.8	-5.6	-3.2
S.D.	19.8	5.7	6.4	17.7	13.4
N	2	2	2	2	2
ADRENAL GLANDS (G)					
MEAN	0.0651	0.0500	0.0658	0.0612	0.0593
% DIFFERENCE		-23.2	1.1	-6.0	-8.9
S.D.	0.00191	0.00799	0.01442	0.00700	0.00297
N	2	2	2	2	2
ADRENAL GLANDS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.023	0.019	0.021	0.023	0.022
% DIFFERENCE		-17.4	-8.7	0.0	-4.3
S.D.	0.0023	0.0027	0.0042	0.0011	0.0021
N	2	2	2	2	2
ADRENAL GLANDS (G/100 G BRAIN)					
MEAN	3.463	2.601	3.359	3.151	3.114
% DIFFERENCE		-24.9	-3.0	-9.0	-10.1
S.D.	0.2058	0.2732	0.5449	0.3379	0.4196
N	2	2	2	2	2
BRAIN (G)					
MEAN	1.88	1.92	1.95	1.94	1.92
% DIFFERENCE		2.1	3.7	3.2	2.1
S.D.	0.057	0.106	0.113	0.014	0.163
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 2

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

MALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
BRAIN (G/100 G FINAL BODY WEIGHT)					
MEAN	0.661	0.742	0.624	0.724	0.694
% DIFFERENCE		12.3	-5.6	9.5	5.0
S.D.	0.0260	0.0248	0.0235	0.0424	0.0252
N	2	2	2	2	2
EPIDIDYMIDES (G)					
MEAN	0.86	0.77	0.86	0.75	0.79
% DIFFERENCE		-10.5	0.0	-12.8	-8.1
S.D.	0.134	0.021	0.085	0.042	0.014
N	2	2	2	2	2
EPIDIDYMIDES (G/100 G FINAL BODY WEIGHT)					
MEAN	0.299	0.296	0.276	0.279	0.287
% DIFFERENCE		-1.0	-7.7	-6.7	-4.0
S.D.	0.0264	0.0017	0.0328	0.0026	0.0191
N	2	2	2	2	2
EPIDIDYMIDES (G/100 G BRAIN)					
MEAN	45.392	39.978	44.303	38.653	41.434
% DIFFERENCE		-11.9	-2.4	-14.8	-8.7
S.D.	5.7805	1.1065	6.9219	1.9052	4.2573
N	2	2	2	2	2
HEART (G)					
MEAN	1.11	0.97	1.17	1.17	1.15
% DIFFERENCE		-12.6	5.4	5.4	3.6
S.D.	0.007	0.021	0.148	0.028	0.120
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 3

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

MALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
HEART (G/100 G FINAL BODY WEIGHT)					
MEAN	0.389	0.374	0.372	0.437	0.415
% DIFFERENCE		-3.9	-4.4	12.3	6.7
S.D.	0.0245	0.0001	0.0399	0.0393	0.0234
N	2	2	2	2	2
HEART (G/100 G BRAIN)					
MEAN	58.798	50.438	59.623	60.316	59.740
% DIFFERENCE		-14.2	1.4	2.6	1.6
S.D.	1.3931	1.6858	4.1557	1.8977	1.2037
N	2	2	2	2	2
KIDNEYS (G)					
MEAN	2.49	2.54	3.01	2.54	2.50
% DIFFERENCE		2.0	20.9	2.0	0.4
S.D.	0.205	0.156	0.262	0.049	0.297
N	2	2	2	2	2
KIDNEYS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.877	0.984	0.961	0.946	0.906
% DIFFERENCE		12.2	9.6	7.9	3.3
S.D.	0.1328	0.0387	0.0642	0.0438	0.0636
N	2	2	2	2	2
KIDNEYS (G/100 G BRAIN)					
MEAN	132.405	132.616	153.973	130.664	130.360
% DIFFERENCE		0.2	16.3	-1.3	-1.5
S.D.	14.8915	0.7777	4.4836	1.5985	4.4372
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 4

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	MALES				
GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
LIVER (G)					
MEAN	9.91	9.74	11.27	11.90	12.76
% DIFFERENCE		-1.7	13.7	20.1	28.8
S.D.	0.382	1.655	0.615	0.870	0.071
N	2	2	2	2	2
LIVER (G/100 G FINAL BODY WEIGHT)					
MEAN	3.481	3.769	3.604	4.429	4.636
% DIFFERENCE		8.3	3.5	27.2	33.2
S.D.	0.1078	0.5587	0.1235	0.0323	0.2004
N	2	2	2	2	2
LIVER (G/100 G BRAIN)					
MEAN	527.061	507.001	577.750	612.997	668.573
% DIFFERENCE		-3.8	9.6	16.3	26.8
S.D.	4.4484	58.3226	1.9753	40.3635	53.0870
N	2	2	2	2	2
PITUITARY (G)					
MEAN	0.0111	0.0098	0.0117	0.0099	0.0093
% DIFFERENCE		-11.7	5.4	-10.8	-16.2
S.D.	0.00099	0.00000	0.00014	0.00113	0.00092
N	2	2	2	2	2
PITUITARY (G/100 G FINAL BODY WEIGHT)					
MEAN	0.004	0.004	0.004	0.004	0.003
% DIFFERENCE		0.0	0.0	0.0	-25.0
S.D.	0.0001	0.0001	0.0001	0.0007	0.0002
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 5

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

MALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
PITUITARY (G/100 G BRAIN)					
MEAN	0.590	0.513	0.601	0.511	0.483
% DIFFERENCE		-13.1	1.9	-13.4	-18.1
S.D.	0.0349	0.0284	0.0421	0.0620	0.0070
N	2	2	2	2	2
PROSTATE (G)					
MEAN	0.74	0.66	0.67	0.52	0.59
% DIFFERENCE		-10.8	-9.5	-29.7	-20.3
S.D.	0.120	0.028	0.035	0.092	0.007
N	2	2	2	2	2
PROSTATE (G/100 G FINAL BODY WEIGHT)					
MEAN	0.257	0.256	0.213	0.191	0.213
% DIFFERENCE		-0.4	-17.1	-25.7	-17.1
S.D.	0.0243	0.0054	0.0157	0.0217	0.0078
N	2	2	2	2	2
PROSTATE (G/100 G BRAIN)					
MEAN	39.017	34.477	34.213	26.530	30.643
% DIFFERENCE		-11.6	-12.3	-32.0	-21.5
S.D.	5.2200	0.4326	3.7981	4.5449	2.2332
N	2	2	2	2	2
SPLEEN (G)					
MEAN	0.55	0.48	0.68	0.67	0.57
% DIFFERENCE		-12.7	23.6	21.8	3.6
S.D.	0.078	0.049	0.035	0.071	0.064
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 6

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

MALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
SPLEEN (G/100 G FINAL BODY WEIGHT)					
MEAN	0.191	0.184	0.216	0.249	0.205
% DIFFERENCE		-3.7	13.1	30.4	7.3
S.D.	0.0140	0.0232	0.0069	0.0099	0.0131
N	2	2	2	2	2
SPLEEN (G/100 G BRAIN)					
MEAN	28.940	24.914	34.621	34.524	29.469
% DIFFERENCE		-13.9	19.6	19.3	1.8
S.D.	3.2665	3.9646	0.1954	3.3932	0.8205
N	2	2	2	2	2
TESTES (G)					
MEAN	3.21	3.60	3.22	3.03	3.07
% DIFFERENCE		12.1	0.3	-5.6	-4.4
S.D.	0.269	0.962	0.177	0.092	0.148
N	2	2	2	2	2
TESTES (G/100 G FINAL BODY WEIGHT)					
MEAN	1.126	1.392	1.030	1.128	1.115
% DIFFERENCE		23.6	-8.5	0.2	-1.0
S.D.	0.0161	0.3422	0.0775	0.0400	0.1083
N	2	2	2	2	2
TESTES (G/100 G BRAIN)					
MEAN	170.607	186.886	165.413	155.915	160.962
% DIFFERENCE		9.5	-3.0	-8.6	-5.7
S.D.	9.1591	39.8665	18.6626	3.6016	21.4242
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 7

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	MALES				
GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
THYMUS (G)					
MEAN	0.3296	0.3269	0.4595	0.2182	0.4109
% DIFFERENCE		-0.8	39.4	-33.8	24.7
S.D.	0.09885	0.05254	0.09447	0.02616	0.26403
N	2	2	2	2	2
THYMUS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.115	0.126	0.147	0.081	0.152
% DIFFERENCE		9.6	27.8	-29.6	32.2
S.D.	0.0267	0.0176	0.0332	0.0044	0.1032
N	2	2	2	2	2
THYMUS (G/100 G BRAIN)					
MEAN	17.461	17.018	23.745	11.243	22.122
% DIFFERENCE		-2.5	36.0	-35.6	26.7
S.D.	4.7328	1.8009	6.2222	1.2666	15.6664
N	2	2	2	2	2
THYROIDS/PARATHY (G)					
MEAN	0.0168	0.0138	0.0151	0.0170	0.0177
% DIFFERENCE		-17.9	-10.1	1.2	5.4
S.D.	0.00014	0.00184	0.00057	0.00403	0.00035
N	2	2	2	2	2
THYROIDS/PARATHY (G/100 G FINAL BODY WEIGHT)					
MEAN	0.006	0.006	0.005	0.007	0.007
% DIFFERENCE		0.0	-16.7	16.7	16.7
S.D.	0.0000	0.0007	0.0000	0.0007	0.0007
N	2	2	2	2	2

MALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
THYROIDS/PARATHY (G/100 G BRAIN)					
MEAN	0.894	0.725	0.777	0.873	0.926
% DIFFERENCE		-18.9	-13.1	-2.3	3.6
S.D.	0.0198	0.1365	0.0742	0.2008	0.0969
N	2	2	2	2	2

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
FINAL BODY WT (G)					
MEAN	200.	197.	198.	176.	185.
% DIFFERENCE		-1.5	-1.0	-12.0	-7.5
S.D.	0.7	14.8	3.5	1.4	19.1
N	2	2	2	2	2
ADRENAL GLANDS (G)					
MEAN	0.0729	0.0697	0.0763	0.0719	0.0675
% DIFFERENCE		-4.4	4.7	-1.4	-7.4
S.D.	0.00792	0.00156	0.00042	0.02192	0.00375
N	2	2	2	2	2
ADRENAL GLANDS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.037	0.036	0.039	0.041	0.037
% DIFFERENCE		-2.7	5.4	10.8	0.0
S.D.	0.0038	0.0035	0.0009	0.0121	0.0018
N	2	2	2	2	2
ADRENAL GLANDS (G/100 G BRAIN)					
MEAN	3.937	3.883	4.103	3.986	3.739
% DIFFERENCE		-1.4	4.2	1.2	-5.0
S.D.	0.5320	0.0714	0.0708	1.2300	0.0707
N	2	2	2	2	2
BRAIN (G)					
MEAN	1.86	1.80	1.86	1.81	1.81
% DIFFERENCE		-3.2	0.0	-2.7	-2.7
S.D.	0.049	0.007	0.042	0.007	0.134
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 10

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
BRAIN (G/100 G FINAL BODY WEIGHT)					
MEAN	0.930	0.916	0.942	1.026	0.980
% DIFFERENCE		-1.5	1.3	10.3	5.4
S.D.	0.0281	0.0728	0.0383	0.0123	0.0286
N	2	2	2	2	2
HEART (G)					
MEAN	0.83	0.85	0.85	0.79	0.83
% DIFFERENCE		2.4	2.4	-4.8	0.0
S.D.	0.092	0.049	0.057	0.057	0.078
N	2	2	2	2	2
HEART (G/100 G FINAL BODY WEIGHT)					
MEAN	0.414	0.430	0.431	0.449	0.447
% DIFFERENCE		3.9	4.1	8.5	8.0
S.D.	0.0475	0.0073	0.0364	0.0285	0.0041
N	2	2	2	2	2
HEART (G/100 G BRAIN)					
MEAN	44.424	47.081	45.676	43.774	45.673
% DIFFERENCE		6.0	2.8	-1.5	2.8
S.D.	3.7701	2.9430	1.9995	3.3055	0.9097
N	2	2	2	2	2
KIDNEYS (G)					
MEAN	1.86	1.96	1.63	1.57	1.77
% DIFFERENCE		5.4	-12.4	-15.6	-4.8
S.D.	0.000	0.276	0.106	0.000	0.148
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 11

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
KIDNEYS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.932	0.992	0.822	0.892	0.958
% DIFFERENCE		6.4	-11.8	-4.3	2.8
S.D.	0.0033	0.0653	0.0390	0.0072	0.0186
N	2	2	2	2	2
KIDNEYS (G/100 G BRAIN)					
MEAN	100.305	108.945	87.453	86.981	97.749
% DIFFERENCE		8.6	-12.8	-13.3	-2.5
S.D.	2.6766	15.7925	7.6972	0.3407	0.9514
N	2	2	2	2	2
LIVER (G)					
MEAN	7.19	7.65	8.02	7.83	10.23
% DIFFERENCE		6.4	11.5	8.9	42.3
S.D.	0.057	0.834	0.686	0.622	0.658
N	2	2	2	2	2
LIVER (G/100 G FINAL BODY WEIGHT)					
MEAN	3.604	3.888	4.056	4.448	5.553
% DIFFERENCE		7.9	12.5	23.4	54.1
S.D.	0.0411	0.1308	0.2747	0.3178	0.2182
N	2	2	2	2	2
LIVER (G/100 G BRAIN)					
MEAN	387.698	426.279	431.447	433.866	566.696
% DIFFERENCE		10.0	11.3	11.9	46.2
S.D.	7.2959	48.1632	46.7171	36.1736	5.7473
N	2	2	2	2	2

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
OVARIES/OVIDUCTS (G)					
MEAN	0.1129	0.1329	0.1017	0.0844	0.1066
% DIFFERENCE		17.7	-9.9	-25.2	-5.6
S.D.	0.01146	0.03642	0.01457	0.00382	0.02022
N	2	2	2	2	2
OVARIES/OVIDUCTS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.057	0.067	0.051	0.048	0.058
% DIFFERENCE		17.5	-10.5	-15.8	1.8
S.D.	0.0059	0.0135	0.0065	0.0026	0.0050
N	2	2	2	2	2
OVARIES/OVIDUCTS (G/100 G BRAIN)					
MEAN	6.080	7.405	5.478	4.676	5.880
% DIFFERENCE		21.8	-9.9	-23.1	-3.3
S.D.	0.4553	2.0579	0.9081	0.1932	0.6827
N	2	2	2	2	2
PITUITARY (G)					
MEAN	0.0146	0.0140	0.0112	0.0101	0.0108
% DIFFERENCE		-4.1	-23.3	-30.8	-26.0
S.D.	0.00057	0.00304	0.00021	0.00035	0.00184
N	2	2	2	2	2
PITUITARY (G/100 G FINAL BODY WEIGHT)					
MEAN	0.007	0.007	0.006	0.006	0.006
% DIFFERENCE		0.0	-14.3	-14.3	-14.3
S.D.	0.0003	0.0010	0.0002	0.0002	0.0004
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 13

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
PITUITARY (G/100 G BRAIN)					
MEAN	0.787	0.777	0.599	0.557	0.596
% DIFFERENCE		-1.3	-23.9	-29.2	-24.3
S.D.	0.0095	0.1725	0.0023	0.0218	0.0575
N	2	2	2	2	2
SPLEEN (G)					
MEAN	0.45	0.41	0.38	0.42	0.47
% DIFFERENCE		-8.9	-15.6	-6.7	4.4
S.D.	0.007	0.007	0.042	0.028	0.057
N	2	2	2	2	2
SPLEEN (G/100 G FINAL BODY WEIGHT)					
MEAN	0.223	0.207	0.192	0.239	0.255
% DIFFERENCE		-7.2	-13.9	7.2	14.3
S.D.	0.0043	0.0192	0.0180	0.0180	0.0043
N	2	2	2	2	2
SPLEEN (G/100 G BRAIN)					
MEAN	23.993	22.562	20.461	23.266	25.994
% DIFFERENCE		-6.0	-14.7	-3.0	8.3
S.D.	0.2589	0.3051	2.7477	1.4759	1.1992
N	2	2	2	2	2
THYMUS (G)					
MEAN	0.3178	0.2692	0.3454	0.2141	0.1314
% DIFFERENCE		-15.3	8.7	-32.6	-58.7
S.D.	0.04313	0.03330	0.11639	0.03932	0.03712
N	2	2	2	2	2

TABLE S10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 14

SPONSOR:AMERICAN PETROLEUM SUMMARY OF ORGAN WEIGHTS AND RELATIVE ORGAN WEIGHTS

	FEMALES				
GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
THYMUS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.159	0.137	0.174	0.122	0.071
% DIFFERENCE		-13.8	9.4	-23.3	-55.3
S.D.	0.0222	0.0066	0.0558	0.0233	0.0128
N	2	2	2	2	2
THYMUS (G/100 G BRAIN)					
MEAN	17.107	14.998	18.646	11.857	7.220
% DIFFERENCE		-12.3	9.0	-30.7	-57.8
S.D.	1.8688	1.9145	6.6828	2.1317	1.5192
N	2	2	2	2	2
THYROIDS/PARATHY (G)					
MEAN	0.0137	0.0147	0.0151	0.0137	0.0157
% DIFFERENCE		7.3	10.2	0.0	14.6
S.D.	0.00042	0.00290	0.00311	0.00007	0.00304
N	2	2	2	2	2
THYROIDS/PARATHY (G/100 G FINAL BODY WEIGHT)					
MEAN	0.007	0.008	0.008	0.008	0.009
% DIFFERENCE		14.3	14.3	14.3	28.6
S.D.	0.0000	0.0021	0.0021	0.0000	0.0007
N	2	2	2	2	2
THYROIDS/PARATHY (G/100 G BRAIN)					
MEAN	0.739	0.816	0.810	0.756	0.863
% DIFFERENCE		10.4	9.6	2.3	16.8
S.D.	0.0035	0.1584	0.1485	0.0071	0.1047
N	2	2	2	2	2

FEMALES

GROUP:	UNTREATED	0 MG/KG/DAY	5 MG/KG/DAY	25 MG/KG/DAY	100 MG/KG/DAY
UTERUS (G)					
MEAN	0.37	0.58	0.35	0.52	0.38
% DIFFERENCE		56.8	-5.4	40.5	2.7
S.D.	0.042	0.212	0.078	0.127	0.057
N	2	2	2	2	2
UTERUS (G/100 G FINAL BODY WEIGHT)					
MEAN	0.185	0.300	0.174	0.296	0.205
% DIFFERENCE		62.2	-5.9	60.0	10.8
S.D.	0.0206	0.1306	0.0363	0.0747	0.0094
N	2	2	2	2	2
UTERUS (G/100 G BRAIN)					
MEAN	19.984	32.289	18.601	28.795	20.994
% DIFFERENCE		61.6	-6.9	44.1	5.1
S.D.	2.8204	11.6907	4.6061	6.9387	1.5714
N	2	2	2	2	2

APPENDIX A

Study Protocol and Deviation

DEVIATION 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 protected from light. On 15 November 2010, a retention sample of the test substance was collected but was not protected from light until 20 December 2010.

  Reason for Deviation: Change in storage conditions.

This deviation did not negatively impact the quality or integrity of the data nor the outcome of the study.

Study Number: WIL-402019

PROTOCOL AMENDMENT 1

Sponsor: American Petroleum Institute

Title of Study:

A 14-Day Dose Range Finding Dermal Toxicity Study Utilizing Clarified Oils, Catalytic Cracked in Sprague Dawley Rats

Protocol Modifications:

1) **7.4.3 Treatment Regimen:**

This section will be replaced with the following:

The vehicle (acetone) 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

Teresa D. Morris, BS — 12/3/10
Study Director — Date

Jozef J.W.M. Mertens, PhD, DABT — 3 Dec 2010
Senior Director, General Toxicology — Date

American Petroleum Institute

Paula Podhasky, BS — 7 Dec 2010
Sponsor Representative — Date

PROTOCOL

A 14-DAY DOSE RANGE FINDING DERMAL TOXICITY STUDY UTILIZING CLARIFIED OILS, CATALYTIC CRACKED 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 Clarified oils, catalytic cracked 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:

Paula Podhasky, BS
American Petroleum Institute
1220 L Street, NW
Washington, DC 20005
Tel: (202) 682-8333
E-mail: Podhaskyp@api.org

2.2 WIL Study Director:

Teresa D. Morris, BS
Senior Toxicologist, Toxicology
Tel: (419) 289-8700
Fax: (419) 289-3650
E-mail: tmorris@wilresearch.com

2.3 WIL Departmental Responsibilities:

Jonathan M. Hurley, BS
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Mark D. Nemec, BS, DABT
President and Chief Operating Officer

Jozef J.W.M Mertens, PhD, DABT
Senior Director, General Toxicology

Alex K. Eapen, PhD, DABT
Assistant Director, Toxicology

Ronald E. Wilson, BS
Director, Informational Systems

Walter R. Miller, Jr., DVM
Clinical Veterinarian, Head of Surgery
and Experimental Medicine

Sally A. Keets, AS
Senior Operations Manager, Vivarium

Erica L. Lashley, BS, LAT
Operations Manager, Toxicology

Theresa M. Rafeld, CPhT
Group Manager, Formulations Laboratory

Carol A. Kopp, BS, LAT
Manager, Gross Pathology and
Developmental Toxicology Laboratory

Robert A. Wally, BS
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-402019; Teresa D. Morris, BS)
Attn. Larry Blessing
WIL Research Laboratories, LLC
1407 George Road
Ashland, Ohio 44805-8946

4.2 Identification:

Clarified oils, catalytic cracked (CAS 64741-62-4)

4.3 Lot Number:

Site #12: Sample #2

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:

Crl:CD(SD)

5.3 Source:

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

5.4 Number of Animals:

Eleven (11) naïve males and 11 naïve females will be purchased. Ten males and 10 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 CO_2 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 Crl: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 ± 5°F (22 ± 3°C) and relative humidity at approximately 50 ± 20%. Temperature and relative humidity will be monitored continuously. Data for these two parameters will be scheduled for automatic collection on an hourly basis. Fluorescent lighting 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 ± 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]	5	3.3	1.5	2	2
4	Test Substance[b]	25	16.6	1.5	2	2
5	Test Substance[b]	100	66.6	1.5	2	2

[a] The vehicle for this study is acetone.
[b] The test substance used for Groups 3-5 is Clarified oils, catalytic cracked.

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 2-5. However, no vehicle or test substance will be applied to the sham control animals.

7.4.3 Treatment Regimen:

The vehicle (acetone) 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 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.

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 2-5 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 acetone. 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 CO_2 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 CO_2 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)
Aorta
Bone with marrow
  Sternum
  Femur with joint
Bone marrow smear (from femur)[a]
Brain
  Cerebrum (2 levels)
  Cerebellum with pons/medulla
Cervix
Epididymides (2)[c]
Exor bital lacrimal glands (2)
Eyes with optic nerves (2)[b]
Gastrointestinal tract
  Esophagus
  Stomach
  Duodenum
  Jejunum
  Ileum
  Cecum
  Colon
  Rectum
Heart
Kidneys (2)
Liver (sections of two lobes)
Lungs (including bronchi, fixed by inflation with fixative)
Lymph node [Axillary and mesenteric (2)]
Skin with mammary gland[d] (females only)
Skeletal muscle (Rectus femoris)
Ovaries (2) with oviducts[e]
Pancreas
Peripheral nerve (sciatic)
Pituitary
Prostate
Salivary glands [mandibular (2)]
Seminal vesicles (2)
Skin
  Treated
  Sham
  Untreated (posterior to treated skin)
Spinal cord
  Cervical
  Thoracic
  Lumbar
Spleen
Testes (2)[c]
Thymus
Thyroid with parathyroids (2)[e]
Trachea
Urinary bladder
Uterus
Vagina
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 skin 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

Paula Podhasky
Paula Podhasky, BS
Sponsor Representative

06 Dec 2010
Date

WIL Research Laboratories, LLC

Teresa D. Morris
Teresa D. Morris, BS
Study Director

12/2/10
Date

Jozef J.W.M. Mertens, PhD, DABT
Senior Director, Toxicology

3 Dec 2010
Date

APPENDIX A

SCORING CRITERIA FOR DERMAL REACTIONS

Evaluation of Dermal Reactions*

Value	Erythema and Eschar Formation	Computer Designation
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

	Edema Formation	Computer Designation
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

TABLE P1 (PRETEST OBSERVATIONS)

PROJECT NO.:WIL-402019P 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

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

	----- M A L E -----
TABLE RANGE:	11-26-10 TO 12-02-10
GROUP:	1
NORMAL	
-NO SIGNIFICANT CLINICAL OBSERVATIONS	11/11
DISPOSITION	
-FOUND DEAD	2/ 2
EYES/EARS/NOSE	
-DRIED RED MATERIAL AROUND LEFT EYE	5/ 5
-DRIED RED MATERIAL AROUND RIGHT EYE	5/ 5
-DRIED RED MATERIAL AROUND NOSE	9/ 9
ORAL/DENTAL	
-DRIED RED MATERIAL AROUND MOUTH	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 15/11

EYES/EARS/NOSE
-DRIED RED MATERIAL AROUND LEFT EYE 3/ 3
-DRIED RED MATERIAL AROUND RIGHT EYE 2/ 2
-DRIED RED MATERIAL AROUND NOSE 7/ 7

1- PRETEST

APPENDIX C

Animal Room Environmental Conditions

STUDY SPECIFICATIONS: 402019 DATE IN 11/23/10 TIME IN 08:00
DATE OUT 12/17/10 TIME OUT 16:00

ROOM SPECIFICATIONS: B ROOM 68 LOW TEMPERATURE °F: 66.0 HIGH TEMPERATURE °F: 76.0 LOW HUMIDITY %RH: 30.0
TEST SYSTEM: RAT LOW TEMPERATURE °C: 18.9 HIGH TEMPERATURE °C: 24.4 HIGH HUMIDITY %RH: 70.0

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
DATE	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
11/23/10	70.6	21.4	70.3	21.3	45.4	46.4
11/24/10	70.5	21.4	70.2	21.2	45.3	46.4
11/25/10	70.6	21.4	70.2	21.2	43.6	44.7
11/26/10	70.5	21.4	70.2	21.2	47.6	48.6
11/27/10	70.4	21.3	70.1	21.2	48.8	49.7
11/28/10	70.7	21.5	70.5	21.4	44.2	45.3
11/29/10	70.5	21.4	70.3	21.3	45.3	46.4
11/30/10	70.6	21.4	70.4	21.3	44.4	45.3
12/01/10	70.5	21.4	70.2	21.2	47.7	48.7
12/02/10	70.4	21.3	70.2	21.2	47.4	48.4
12/03/10	70.3	21.3	70.1	21.2	47.0	48.1
12/04/10	70.5	21.4	70.4	21.3	44.1	45.2
12/05/10	70.4	21.3	70.2	21.2	46.2	47.1
12/06/10	70.5	21.4	70.3	21.3	47.2	48.0
12/07/10	70.4	21.3	70.2	21.2	45.8	46.7
12/08/10	70.7	21.5	70.6	21.4	45.1	46.2
12/09/10	70.4	21.3	70.2	21.2	46.0	47.1
12/10/10	70.4	21.3	70.1	21.2	47.4	48.4
12/11/10	70.5	21.4	70.3	21.3	44.0	45.1

	PRIMARY TEMP		SECONDARY TEMP		PRIMARY HUM	SECONDARY HUM
DATE	MEAN (°F)	MEAN (°C)	MEAN (°F)	MEAN (°C)	MEAN (%RH)	MEAN (%RH)
12/12/10	70.4	21.3	70.2	21.2	46.9	47.9
12/13/10	70.4	21.3	70.3	21.3	42.4	43.3
12/14/10	70.4	21.3	70.4	21.3	42.3	43.3
12/15/10	70.5	21.4	70.4	21.3	42.7	44.0
12/16/10	70.3	21.3	70.1	21.2	42.4	43.8
12/17/10	70.5	21.4	70.3	21.3	43.2	44.5

SUMMARY OF DAILY MEANS	MEAN	MIN	MAX
PRIMARY TEMP °F:	70.5	70.3	70.7
PRIMARY TEMP °C:	21.4	21.3	21.5
SECONDARY TEMP °F:	70.3	70.1	70.6
SECONDARY TEMP °C:	21.3	21.2	21.4
PRIMARY HUM %RH:	45.3	42.3	48.8
SECONDARY HUM %RH:	46.4	43.3	49.7
N DAYS	25		

B ROOM 68 SUMMARY OF HOURLY VALUES

	PRIMARY TEMP				SECONDARY TEMP				PRIMARY HUM		SECONDARY HUM	
MEAN	70.5	°F	21.4	°C	70.3	°F	21.3	°C	45.3	%RH	46.4	%RH
MIN	68.2	°F	20.1	°C	67.7	°F	19.8	°C	37.5	%RH	38.5	%RH
MAX	72.4	°F	22.4	°C	71.8	°F	22.1	°C	58.5	%RH	59.0	%RH
SD	0.38		0.21		0.46		0.26		2.82		2.75	
SE	0.02		0.01		0.02		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											

STUDY 402019 SUMMARY OF HOURLY VALUES

	PRIMARY TEMP				SECONDARY TEMP				PRIMARY HUM		SECONDARY HUM	
MEAN	70.5	°F	21.4	°C	70.3	°F	21.3	°C	45.3	%RH	46.4	%RH
MIN	68.2	°F	20.1	°C	67.7	°F	19.8	°C	37.5	%RH	38.5	%RH
MAX	72.4	°F	22.4	°C	71.8	°F	22.1	°C	58.5	%RH	59.0	%RH
SD	0.38		0.21		0.46		0.26		2.82		2.75	
SE	0.02		0.01		0.02		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											

APPENDIX D

Scoring Criteria for Dermal Reactions

SCORING CRITERIA FOR DERMAL REACTIONS

Evaluation of Dermal Reactions*

Value	Erythema and Eschar Formation	Computer Designation
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

Value	Edema Formation	Computer Designation
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 E

Unscheduled Dermal Observations

TABLE U1 (UNSCHEDULED OBSERVATIONS)

PROJECT NO.:WIL-402019V 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DERMAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90175	M	25 MG/KG/DAY	SPECIAL II	0	14:29	P	NO ERYTHEMA
				0	14:29	P	NO EDEMA
				0	16:37	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR
90219	M	25 MG/KG/DAY	SPECIAL II	0	14:29	P	NO ERYTHEMA
				0	14:29	P	NO EDEMA
				0	16:37	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR
90166	M	100 MG/KG/DAY	SPECIAL II	0	14:30	P	NO ERYTHEMA
				0	14:30	P	NO EDEMA
				0	16:38	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR
90221	M	100 MG/KG/DAY	SPECIAL II	0	14:30	P	NO ERYTHEMA
				0	14:30	P	NO EDEMA
				0	16:38	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR
90178	F	25 MG/KG/DAY	SPECIAL II	0	14:29	P	NO ERYTHEMA
				0	14:29	P	NO EDEMA
				0	16:37	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR
90179	F	25 MG/KG/DAY	SPECIAL II	0	14:29	P	NO ERYTHEMA
				0	14:29	P	NO EDEMA
				0	16:38	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR
90176	F	100 MG/KG/DAY	SPECIAL II	0	14:30	P	NO ERYTHEMA
				0	14:30	P	NO EDEMA
				0	16:38	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR
90177	F	100 MG/KG/DAY	SPECIAL II	0	14:30	P	NO ERYTHEMA
				0	14:30	P	NO EDEMA
				0	16:38	P	RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE 1-2 HOUR

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

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APPENDIX F

Individual Animal Data

TABLE A1

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
90165	M	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90167	M	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90169	M	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90172	M	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90171	M	5 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90174	M	5 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90175	M	25 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90219	M	25 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90166	M	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90221	M	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14

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

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
90181	F	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90186	F	UNTREATED	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90180	F	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90185	F	0 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90182	F	5 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90184	F	5 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90178	F	25 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90179	F	25 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90176	F	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14
90177	F	100 MG/KG/DAY	SCHEDULED EUTHANASIA	10	17-DEC-10	14

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

TABLE A2 (DETAILED PHYSICAL EXAMINATIONS/DISPOSITIONS)

PROJECT NO.:WIL-402019M — 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED — PAGE 1

SPONSOR:AMERICAN PETROLEUM — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90165	M	UNTREATED	NORMAL	0	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90165	M	UNTREATED	DISPOSITION	14	9:19	P	PRIMARY NECROPSY (DAY 14)
90165	M	UNTREATED	EYES/EARS/NOSE	7	8:37	P	DRIED RED MATERIAL AROUND NOSE
90167	M	UNTREATED	NORMAL	0	8:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90167	M	UNTREATED	DISPOSITION	14	9:19	P	PRIMARY NECROPSY (DAY 14)
90167	M	UNTREATED	BODY/INTEGUMENT	7	8:39	P	DRIED YELLOW MATERIAL UROGENITAL AREA
90167	M	UNTREATED	EYES/EARS/NOSE	7	8:38	P	DRIED RED MATERIAL AROUND NOSE
				7	8:38	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	8:38	P	DRIED RED MATERIAL AROUND LEFT EYE
90169	M	0 MG/KG/DAY	NORMAL	0	8:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90169	M	0 MG/KG/DAY	DISPOSITION	14	9:19	P	PRIMARY NECROPSY (DAY 14)
90169	M	0 MG/KG/DAY	EYES/EARS/NOSE	7	8:41	P	DRIED RED MATERIAL AROUND NOSE
				7	8:41	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	8:41	P	DRIED RED MATERIAL AROUND LEFT EYE
90169	M	0 MG/KG/DAY	SPECIAL	7	8:42	P	SWOLLEN FACIAL AREA
90172	M	0 MG/KG/DAY	NORMAL	0	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90172	M	0 MG/KG/DAY	DISPOSITION	14	9:19	P	PRIMARY NECROPSY (DAY 14)
90172	M	0 MG/KG/DAY	EYES/EARS/NOSE	7	8:42	P	DRIED RED MATERIAL AROUND NOSE
				7	8:42	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	8:42	P	DRIED RED MATERIAL AROUND LEFT EYE
90171	M	5 MG/KG/DAY	NORMAL	0	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90171	M	5 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90171	M	5 MG/KG/DAY	EYES/EARS/NOSE	7	8:44	P	DRIED RED MATERIAL AROUND NOSE
90171	M	5 MG/KG/DAY	BODY/INTEG II	14	8:42	P	SCABBING VENTRAL NECK
90174	M	5 MG/KG/DAY	NORMAL	0	8:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90174	M	5 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90174	M	5 MG/KG/DAY	EYES/EARS/NOSE	7	8:45	P	DRIED RED MATERIAL AROUND NOSE
90174	M	5 MG/KG/DAY	BODY/INTEG II	14	8:43	P	SCABBING VENTRAL NECK
90174	M	5 MG/KG/DAY	SPECIAL	7	8:45	P	SWOLLEN FACIAL AREA
90175	M	25 MG/KG/DAY	NORMAL	0	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90175	M	25 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90175	M	25 MG/KG/DAY	EYES/EARS/NOSE	7	8:48	P	DRIED RED MATERIAL AROUND NOSE
90175	M	25 MG/KG/DAY	SPECIAL	7	8:48	P	SWOLLEN FACIAL AREA
90219	M	25 MG/KG/DAY	NORMAL	0	8:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90219	M	25 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90219	M	25 MG/KG/DAY	EYES/EARS/NOSE	7	8:48	P	DRIED RED MATERIAL AROUND LEFT EYE
90219	M	25 MG/KG/DAY	SPECIAL	7	8:48	P	SWOLLEN FACIAL AREA
90166	M	100 MG/KG/DAY	NORMAL	0	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90166	M	100 MG/KG/DAY	DISPOSITION	14	9:21	P	PRIMARY NECROPSY (DAY 14)
90166	M	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:50	P	DRIED RED MATERIAL AROUND NOSE
90221	M	100 MG/KG/DAY	NORMAL	0	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90221	M	100 MG/KG/DAY	DISPOSITION	14	9:21	P	PRIMARY NECROPSY (DAY 14)
90221	M	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:51	P	DRIED RED MATERIAL AROUND RIGHT EYE
90181	F	UNTREATED	NORMAL	0	8:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90181	F	UNTREATED	DISPOSITION	14	9:19	P	PRIMARY NECROPSY (DAY 14)
90181	F	UNTREATED	EYES/EARS/NOSE	7	8:39	P	DRIED RED MATERIAL AROUND NOSE
90186	F	UNTREATED	NORMAL	0	8:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90186	F	UNTREATED	DISPOSITION	14	9:19	P	PRIMARY NECROPSY (DAY 14)
90186	F	UNTREATED	EYES/EARS/NOSE	7	8:40	P	DRIED RED MATERIAL AROUND NOSE
90180	F	0 MG/KG/DAY	NORMAL	0	8:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90180	F	0 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)

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

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90180	F	0 MG/KG/DAY	EYES/EARS/NOSE	7	8:43	P	DRIED RED MATERIAL AROUND NOSE
90185	F	0 MG/KG/DAY	NORMAL	0	8:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90185	F	0 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90185	F	0 MG/KG/DAY	EYES/EARS/NOSE	7	8:43	P	DRIED RED MATERIAL AROUND RIGHT EYE
				7	8:43	P	DRIED RED MATERIAL AROUND LEFT EYE
90182	F	5 MG/KG/DAY	NORMAL	0	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90182	F	5 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90182	F	5 MG/KG/DAY	EYES/EARS/NOSE	7	8:46	P	DRIED RED MATERIAL AROUND LEFT EYE
90182	F	5 MG/KG/DAY	SPECIAL	7	8:46	P	SWOLLEN FACIAL AREA
90184	F	5 MG/KG/DAY	NORMAL	0	8:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				14	8:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90184	F	5 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90184	F	5 MG/KG/DAY	EYES/EARS/NOSE	7	8:47	P	DRIED RED MATERIAL AROUND NOSE
				7	8:47	P	DRIED RED MATERIAL AROUND LEFT EYE
90178	F	25 MG/KG/DAY	NORMAL	0	8:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90178	F	25 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90178	F	25 MG/KG/DAY	EYES/EARS/NOSE	7	8:49	P	DRIED RED MATERIAL AROUND NOSE
90179	F	25 MG/KG/DAY	NORMAL	0	8:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90179	F	25 MG/KG/DAY	DISPOSITION	14	9:20	P	PRIMARY NECROPSY (DAY 14)
90179	F	25 MG/KG/DAY	EYES/EARS/NOSE	7	8:50	P	DRIED RED MATERIAL AROUND NOSE
90176	F	100 MG/KG/DAY	NORMAL	0	8:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90176	F	100 MG/KG/DAY	DISPOSITION	14	9:21	P	PRIMARY NECROPSY (DAY 14)
90176	F	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:52	P	DRIED RED MATERIAL AROUND NOSE
				14	8:58	P	DRIED RED MATERIAL AROUND NOSE
90177	F	100 MG/KG/DAY	NORMAL	0	8:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90177	F	100 MG/KG/DAY	DISPOSITION	14	9:21	P	PRIMARY NECROPSY (DAY 14)
90177	F	100 MG/KG/DAY	EYES/EARS/NOSE	7	8:53	P	DRIED RED MATERIAL AROUND NOSE

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

STUDY DAYS: 0 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90177	F	100 MG/KG/DAY	SPECIAL	7	8:53	P	SWOLLEN FACIAL AREA

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

TABLE A3 (AT TIME OF DOSING)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90165	M	UNTREATED	NORMAL	0	14:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90167	M	UNTREATED	NORMAL	0	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90169	M	0 MG/KG/DAY	NORMAL	0	14:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A3 (AT TIME OF DOSING)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90169	M	0 MG/KG/DAY	NORMAL	1	12:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90172	M	0 MG/KG/DAY	NORMAL	0	14:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90171	M	5 MG/KG/DAY	NORMAL	0	14:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A3 (AT TIME OF DOSING)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90171	M	5 MG/KG/DAY	NORMAL	4	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90174	M	5 MG/KG/DAY	NORMAL	0	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90175	M	25 MG/KG/DAY	NORMAL	0	15:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A3 (AT TIME OF DOSING)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90175	M	25 MG/KG/DAY	NORMAL	10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90219	M	25 MG/KG/DAY	NORMAL	0	15:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90166	M	100 MG/KG/DAY	NORMAL	0	15:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90221	M	100 MG/KG/DAY	NORMAL	0	15:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90221	M	100 MG/KG/DAY	NORMAL	5	11:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90181	F	UNTREATED	NORMAL	0	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90186	F	UNTREATED	NORMAL	0	14:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A3 (AT TIME OF DOSING)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90186	F	UNTREATED	NORMAL	6	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90180	F	0 MG/KG/DAY	NORMAL	0	14:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	12:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90185	F	0 MG/KG/DAY	NORMAL	0	14:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A3 (AT TIME OF DOSING)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90185	F	0 MG/KG/DAY	NORMAL	7	13:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90182	F	5 MG/KG/DAY	NORMAL	0	14:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90184	F	5 MG/KG/DAY	NORMAL	0	15:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	12:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A3 (AT TIME OF DOSING)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90184	F	5 MG/KG/DAY	NORMAL	12	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90178	F	25 MG/KG/DAY	NORMAL	0	15:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90179	F	25 MG/KG/DAY	NORMAL	0	15:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90176	F	100 MG/KG/DAY	NORMAL	0	15:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90176	F	100 MG/KG/DAY	NORMAL	7	13:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90177	F	100 MG/KG/DAY	NORMAL	0	15:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	14:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	11:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	13:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	10:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	12:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A4 (DOSING DAY OBSERVATIONS)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90165	M	UNTREATED	NORMAL	0	16:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90167	M	UNTREATED	NORMAL	0	16:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	13:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90169	M	0 MG/KG/DAY	NORMAL	0	16:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90169	M	0 MG/KG/DAY	NORMAL	1	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90172	M	0 MG/KG/DAY	NORMAL	0	16:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90171	M	5 MG/KG/DAY	NORMAL	0	16:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A4 (DOSING DAY OBSERVATIONS)

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90171	M	5 MG/KG/DAY	NORMAL	2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90174	M	5 MG/KG/DAY	NORMAL	0	16:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90175	M	25 MG/KG/DAY	NORMAL	1	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90175	M	25 MG/KG/DAY	NORMAL	4	15:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90219	M	25 MG/KG/DAY	NORMAL	1	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90166	M	100 MG/KG/DAY	NORMAL	1	14:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90166	M	100 MG/KG/DAY	NORMAL	7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90221	M	100 MG/KG/DAY	NORMAL	1	14:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90181	F	UNTREATED	NORMAL	0	16:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90181	F	UNTREATED	NORMAL	9	12:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90186	F	UNTREATED	NORMAL	0	16:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90180	F	0 MG/KG/DAY	NORMAL	0	16:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90180	F	0 MG/KG/DAY	NORMAL	10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90185	F	0 MG/KG/DAY	NORMAL	0	16:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90182	F	5 MG/KG/DAY	NORMAL	0	16:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90182	F	5 MG/KG/DAY	NORMAL	11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90184	F	5 MG/KG/DAY	NORMAL	0	16:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				1	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90178	F	25 MG/KG/DAY	NORMAL	1	14:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90178	F	25 MG/KG/DAY	NORMAL	13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90179	F	25 MG/KG/DAY	NORMAL	1	14:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90176	F	100 MG/KG/DAY	NORMAL	1	14:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90177	F	100 MG/KG/DAY	NORMAL	1	14:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	12:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

STUDY DAYS: 0 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90177	F	100 MG/KG/DAY	NORMAL	3	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	15:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	12:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	12:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	14:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	11:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	12:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	12:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	13:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

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

TABLE A5

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DERMAL OBSERVATIONS

GROUP : UNTREATED	ANIMAL NO. / SEX	
	90165/M	90167/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

TABLE A5

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DERMAL OBSERVATIONS

GROUP : 0 MG/KG/DAY	ANIMAL NO. / SEX	
	90169/M	90172/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

TABLE A5

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DERMAL OBSERVATIONS

GROUP : 5 MG/KG/DAY	ANIMAL NO. / SEX	
	90171/M	90174/M
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
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	SNR	SNR
8	SNR	SNR
9	0/0/h	0/0/h
10	0/0/h	0/0/h
11	0/0/h	0/0/h
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
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

GROUP : 25 MG/KG/DAY	ANIMAL NO. / SEX	
	90175/M	90219/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	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
SNR = SCORED, NOT REMARKABLE
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

GROUP : 100 MG/KG/DAY	ANIMAL NO. / SEX	
	90166/M	90221/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	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
SNR = SCORED, NOT REMARKABLE
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

TABLE A5

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DERMAL OBSERVATIONS

GROUP : UNTREATED	ANIMAL NO. / SEX	
	90181/F	90186/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

SNR = SCORED, NOT REMARKABLE

GROUP : 0 MG/KG/DAY	ANIMAL NO. / SEX	
	90180/F	90185/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
SNR = SCORED, NOT REMARKABLE

TABLE A5

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL DERMAL OBSERVATIONS

GROUP : 5 MG/KG/DAY	ANIMAL NO. / SEX	
	90182/F	90184/F
STUDY DAY	ERYTHEMA+/EDEMA+/OTHER FINDINGS	
0	SNR	SNR
1	SNR	SNR
2	0/0/h	0/0/h
3	0/0/h	0/0/h
4	0/0/h	0/0/h
5	SNR	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	SNR	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

GROUP : 25 MG/KG/DAY	ANIMAL NO. / SEX	
	90178/F	90179/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	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
SNR = SCORED, NOT REMARKABLE
h = RESIDUAL TEST SUBSTANCE WITHIN DOSE SITE

GROUP : 100 MG/KG/DAY	ANIMAL NO. / SEX	
	90176/F	90177/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	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

TABLE A6

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

MALE GROUP: UNTREATED

DAY	-7	-1	0	7	13
ANIMAL					
90165	220.	259.	275.	298.	333.
90167	215.	238.	266.	279.	303.
MEAN	218.	249.	271.	289.	318.
S.D.	3.5	14.8	6.4	13.4	21.2
N	2	2	2	2	2

MALE GROUP: 0 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90169	219.	255.	266.	278.	295.
90172	208.	222.	246.	257.	279.
MEAN	214.	239.	256.	268.	287.
S.D.	7.8	23.3	14.1	14.8	11.3
N	2	2	2	2	2

MALE GROUP: 5 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90171	224.	251.	268.	303.	339.
90174	235.	282.	300.	328.	354.
MEAN	230.	267.	284.	316.	347.
S.D.	7.8	21.9	22.6	17.7	10.6
N	2	2	2	2	2

MALE GROUP: 25 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90175	218.	245.	272.	290.	311.
90219	206.	251.	255.	276.	296.
MEAN	212.	248.	264.	283.	304.
S.D.	8.5	4.2	12.0	9.9	10.6
N	2	2	2	2	2

TABLE A6

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

MALE GROUP: 100 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90166	209.	237.	249.	272.	299.
90221	223.	276.	288.	300.	308.
MEAN	216.	257.	269.	286.	304.
S.D.	9.9	27.6	27.6	19.8	6.4
N	2	2	2	2	2

TABLE A6

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

FEMALE GROUP: UNTREATED

DAY	-7	-1	0	7	13
ANIMAL					
90181	179.	181.	195.	206.	224.
90186	183.	197.	206.	212.	222.
MEAN	181.	189.	201.	209.	223.
S.D.	2.8	11.3	7.8	4.2	1.4
N	2	2	2	2	2

TABLE A6

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHTS [G]

FEMALE GROUP: 0 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90180	181.	182.	198.	194.	208.
90185	182.	198.	208.	220.	232.
MEAN	182.	190.	203.	207.	220.
S.D.	0.7	11.3	7.1	18.4	17.0
N	2	2	2	2	2

FEMALE GROUP: 5 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90182	181.	189.	196.	206.	222.
90184	161.	195.	200.	216.	223.
MEAN	171.	192.	198.	211.	223.
S.D.	14.1	4.2	2.8	7.1	0.7
N	2	2	2	2	2

FEMALE GROUP: 25 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90178	174.	195.	195.	192.	205.
90179	176.	182.	190.	188.	200.
MEAN	175.	189.	193.	190.	203.
S.D.	1.4	9.2	3.5	2.8	3.5
N	2	2	2	2	2

FEMALE GROUP: 100 MG/KG/DAY

DAY	-7	-1	0	7	13
ANIMAL					
90176	174.	176.	187.	182.	192.
90177	184.	192.	206.	213.	227.
MEAN	179.	184.	197.	198.	210.
S.D.	7.1	11.3	13.4	21.9	24.7
N	2	2	2	2	2

TABLE A7

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

MALE GROUP: UNTREATED

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90165	39.	16.	23.	35.
90167	23.	28.	13.	24.
MEAN	31.	22.	18.	30.
S.D.	11.3	8.5	7.1	7.8
N	2	2	2	2

TABLE A7

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM 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				
90169	36.	11.	12.	17.
90172	14.	24.	11.	22.
MEAN	25.	18.	12.	20.
S.D.	15.6	9.2	0.7	3.5
N	2	2	2	2

TABLE A7

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

MALE GROUP: 5 MG/KG/DAY

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90171	27.	17.	35.	36.
90174	47.	18.	28.	26.
MEAN	37.	18.	32.	31.
S.D.	14.1	0.7	4.9	7.1
N	2	2	2	2

TABLE A7

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

MALE GROUP: 25 MG/KG/DAY

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90175	27.	27.	18.	21.
90219	45.	4.	21.	20.
MEAN	36.	16.	20.	21.
S.D.	12.7	16.3	2.1	0.7
N	2	2	2	2

TABLE A7

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM 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				
90166	28.	12.	23.	27.
90221	53.	12.	12.	8.
MEAN	41.	12.	18.	18.
S.D.	17.7	0.0	7.8	13.4
N	2	2	2	2

FEMALE GROUP: UNTREATED

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90181	2.	14.	11.	18.
90186	14.	9.	6.	10.
MEAN	8.	12.	9.	14.
S.D.	8.5	3.5	3.5	5.7
N	2	2	2	2

FEMALE GROUP: 0 MG/KG/DAY

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90180	1.	16.	-4.	14.
90185	16.	10.	12.	12.
MEAN	9.	13.	4.	13.
S.D.	10.6	4.2	11.3	1.4
N	2	2	2	2

TABLE A7

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALE GROUP: 5 MG/KG/DAY

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90182	8.	7.	10.	16.
90184	34.	5.	16.	7.
MEAN	21.	6.	13.	12.
S.D.	18.4	1.4	4.2	6.4
N	2	2	2	2

FEMALE GROUP: 25 MG/KG/DAY

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90178	21.	0.	-3.	13.
90179	6.	8.	-2.	12.
MEAN	14.	4.	-3.	13.
S.D.	10.6	5.7	0.7	0.7
N	2	2	2	2

FEMALE GROUP: 100 MG/KG/DAY

DAY	-7 TO -1	-1 TO 0	0 TO 7	7 TO 13
ANIMAL				
90176	2.	11.	-5.	10.
90177	8.	14.	7.	14.
MEAN	5.	13.	1.	12.
S.D.	4.2	2.1	8.5	2.8
N	2	2	2	2

TABLE A8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: UNTREATED

DAY	0 TO 7	0 TO 13
ANIMAL		
90165	23.	58.
90167	13.	37.
MEAN	18.	48.
S.D.	7.1	14.8
N	2	2

TABLE A8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: 0 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90169	12.	29.
90172	11.	33.
MEAN	12.	31.
S.D.	0.7	2.8
N	2	2

TABLE A8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 3

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: 5 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90171	35.	71.
90174	28.	54.
MEAN	32.	63.
S.D.	4.9	12.0
N	2	2

TABLE A8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: 25 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90175	18.	39.
90219	21.	41.
MEAN	20.	40.
S.D.	2.1	1.4
N	2	2

TABLE A8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALE GROUP: 100 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90166	23.	50.
90221	12.	20.
MEAN	18.	35.
S.D.	7.8	21.2
N	2	2

FEMALE GROUP: UNTREATED

DAY	0 TO 7	0 TO 13
ANIMAL		
90181	11.	29.
90186	6.	16.
MEAN	9.	23.
S.D.	3.5	9.2
N	2	2

TABLE A8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED
SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: 0 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90180	-4.	10.
90185	12.	24.
MEAN	4.	17.
S.D.	11.3	9.9
N	2	2

TABLE A8

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALE GROUP: 5 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90182	10.	26.
90184	16.	23.
MEAN	13.	25.
S.D.	4.2	2.1
N	2	2

FEMALE GROUP: 25 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90178	-3.	10.
90179	-2.	10.
MEAN	-3.	10.
S.D.	0.7	0.0
N	2	2

FEMALE GROUP: 100 MG/KG/DAY

DAY	0 TO 7	0 TO 13
ANIMAL		
90176	-5.	5.
90177	7.	21.
MEAN	1.	13.
S.D.	8.5	11.3
N	2	2

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

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

MALE GROUP: UNTREATED

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90165	31.	37.	37.
90167	27.	33.	35.
MEAN	29.	35.	36.
S.D.	2.8	2.8	1.4
N	2	2	2

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

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

MALE GROUP: 0 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90169	27.	29.	32.
90172	24.	25.	33.
MEAN	26.	27.	33.
S.D.	2.1	2.8	0.7
N	2	2	2

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 3

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

MALE GROUP: 5 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90171	25.	36.	36.
90174	30.	34.	38.
MEAN	28.	35.	37.
S.D.	3.5	1.4	1.4
N	2	2	2

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 4

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

MALE GROUP: 25 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90175	31.	33.	NA
90219	29.	31.	33.
MEAN	30.	32.	33.
S.D.	1.4	1.4	0.0
N	2	2	1

NA = NOT APPLICABLE

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 5

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

MALE GROUP: 100 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90166	24.	27.	30.
90221	33.	33.	32.
MEAN	29.	30.	31.
S.D.	6.4	4.2	1.4
N	2	2	2

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 6

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

FEMALE GROUP: UNTREATED

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90181	23.	30.	NA
90186	21.	26.	30.
MEAN	22.	28.	30.
S.D.	1.4	2.8	0.0
N	2	2	1

NA = NOT APPLICABLE

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 7

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

FEMALE GROUP: 0 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90180	19.	21.	27.
90185	19.	24.	27.
MEAN	19.	23.	27.
S.D.	0.0	2.1	0.0
N	2	2	2

TABLE A9

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 8

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

FEMALE GROUP: 5 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90182	23.	NA	NA
90184	25.	28.	28.
MEAN	24.	28.	28.
S.D.	1.4	0.0	0.0
N	2	1	1

NA = NOT APPLICABLE

FEMALE GROUP: 25 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90178	21.	21.	26.
90179	18.	27.	NA
MEAN	20.	24.	26.
S.D.	2.1	4.2	0.0
N	2	2	1

NA = NOT APPLICABLE

FEMALE GROUP: 100 MG/KG/DAY

DAY	-7 TO -1	0 TO 7	7 TO 13
ANIMAL			
90176	18.	22.	23.
90177	21.	26.	28.
MEAN	20.	24.	26.
S.D.	2.1	2.8	3.5
N	2	2	2

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90165 GROUP 1: UNTREATED MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.92	0.642
LIVER	10.18	3.405
KIDNEYS	2.34	0.783
SPLEEN	0.60	0.201
HEART	1.11	0.371
PROSTATE	0.82	0.274
EPIDIDYMIDES	0.95	0.318
TESTES	3.40	1.137
THYMUS	0.3995	0.134
ADRENAL GLANDS	0.0637	0.021
PITUITARY	0.0118	0.004
THYROIDS/PARATHY	0.0169	0.006
FINAL BODY WT(G)	299.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
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	LN, AXILLARY	SKIN- TREATED
	SKIN- UNTREATED			

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90167 GROUP 1: UNTREATED MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.679
LIVER	9.64	3.557
KIDNEYS	2.63	0.970
SPLEEN	0.49	0.181
HEART	1.10	0.406
PROSTATE	0.65	0.240
EPIDIDYMIDES	0.76	0.280
TESTES	3.02	1.114
THYMUS	0.2597	0.096
ADRENAL GLANDS	0.0664	0.025
PITUITARY	0.0104	0.004
THYROIDS/PARATHY	0.0167	0.006
FINAL BODY WT(G)	271.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

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	LN, AXILLARY	SKIN- TREATED
SKIN- UNTREATED			

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 3

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90169 GROUP 2: 0 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.99	0.760
LIVER	10.91	4.164
KIDNEYS	2.65	1.011
SPLEEN	0.44	0.168
HEART	0.98	0.374
PROSTATE	0.68	0.260
EPIDIDYMIDES	0.78	0.298
TESTES	4.28	1.634
THYMUS	0.3640	0.139
ADRENAL GLANDS	0.0556	0.021
PITUITARY	0.0098	0.004
THYROIDS/PARATHY	0.0125	0.005
FINAL BODY WT(G)	262.	

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	LN, AXILLARY	SKIN- TREATED	
SKIN- UNTREATED				

GRADE

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90172 GROUP 2: 0 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.724
LIVER	8.57	3.374
KIDNEYS	2.43	0.957
SPLEEN	0.51	0.201
HEART	0.95	0.374
PROSTATE	0.64	0.252
EPIDIDYMIDES	0.75	0.295
TESTES	2.92	1.150
THYMUS	0.2897	0.114
ADRENAL GLANDS	0.0443	0.017
PITUITARY	0.0098	0.004
THYROIDS/PARATHY	0.0151	0.006
FINAL BODY WT(G)	254.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
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	LN, AXILLARY	SKIN- TREATED
	SKIN- UNTREATED			

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

ANIMAL NO. 90171 GROUP 3: 5 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.87	0.607
LIVER	10.83	3.516
KIDNEYS	2.82	0.916
SPLEEN	0.65	0.211
HEART	1.06	0.344
PROSTATE	0.69	0.224
EPIDIDYMIDES	0.92	0.299
TESTES	3.34	1.084
THYMUS	0.5263	0.171
ADRENAL GLANDS	0.0556	0.018
PITUITARY	0.0118	0.004
THYROIDS/PARATHY	0.0155	0.005
FINAL BODY WT(G)	308.	

		GRADE
EPIDIDYMIDES	GROSS: AREA(S), RAISED	P
	THREE, 1 TO 2 MM IN DIAMETER, CAUDA, RIGHT	
SKIN	GROSS: SCABBING	P
	VENTRAL NECK; 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
NERVE, SCIATIC	PANCREAS	PITUITARY	PROSTATE
RECTUM	SPINAL CORD	SAL. GLAND MAND	STOMACH
SKELETAL MUSCLE	SPLEEN	SEMINAL VESICLES	TESTES
THYROID GLANDS	THYMUS	TRACHEA	URINARY BLADDER
LN, AXILLARY	SKIN- TREATED	SKIN- UNTREATED	

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90174 GROUP 3: 5 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.640
LIVER	11.70	3.691
KIDNEYS	3.19	1.006
SPLEEN	0.70	0.221
HEART	1.27	0.401
PROSTATE	0.64	0.202
EPIDIDYMIDES	0.80	0.252
TESTES	3.09	0.975
THYMUS	0.3927	0.124
ADRENAL GLANDS	0.0760	0.024
PITUITARY	0.0116	0.004
THYROIDS/PARATHY	0.0147	0.005
FINAL BODY WT(G)	317.	

		GRADE
KIDNEYS	GROSS: AREA(S), DEPRESSED FEW, PINPOINT, IN CORTEX, BILATERAL	P
SKIN	GROSS: SCABBING VENTRAL NECK; CEO SCABBING	P
LN, AXILLARY	GROSS: ENLARGED BILATERAL	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNUM	FEMUR
JOINT	BRAIN	CECUM	COLON
DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES
NERVES, OPTIC	HEART	ILEUM	JEJUNUM
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- TREATED	SKIN- UNTREATED		

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 7

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90175 GROUP 4: 25 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.95	0.694
LIVER	12.51	4.452
KIDNEYS	2.57	0.915
SPLEEN	0.72	0.256
HEART	1.15	0.409
PROSTATE	0.58	0.206
EPIDIDYMIDES	0.78	0.278
TESTES	3.09	1.100
THYMUS	0.2367	0.084
ADRENAL GLANDS	0.0661	0.024
PITUITARY	0.0091	0.003
THYROIDS/PARATHY	0.0198	0.007
FINAL BODY WT(G)	281.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

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	LN, AXILLARY	SKIN- TREATED
SKIN- UNTREATED			

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 8

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90219 GROUP 4: 25 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.93	0.754
LIVER	11.28	4.406
KIDNEYS	2.50	0.977
SPLEEN	0.62	0.242
HEART	1.19	0.465
PROSTATE	0.45	0.176
EPIDIDYMIDES	0.72	0.281
TESTES	2.96	1.156
THYMUS	0.1997	0.078
ADRENAL GLANDS	0.0562	0.022
PITUITARY	0.0107	0.004
THYROIDS/PARATHY	0.0141	0.006
FINAL BODY WT(G)	256.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
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	LN, AXILLARY	SKIN- TREATED
	SKIN- UNTREATED			

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 9

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90166 GROUP 5: 100 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.80	0.677
LIVER	12.71	4.778
KIDNEYS	2.29	0.861
SPLEEN	0.52	0.195
HEART	1.06	0.398
PROSTATE	0.58	0.218
EPIDIDYMIDES	0.80	0.301
TESTES	3.17	1.192
THYMUS	0.5976	0.225
ADRENAL GLANDS	0.0614	0.023
PITUITARY	0.0086	0.003
THYROIDS/PARATHY	0.0179	0.007
FINAL BODY WT(G)	266.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

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	LN, AXILLARY	SKIN- TREATED
SKIN- UNTREATED			

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 10

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90221 GROUP 5: 100 MG/KG/DAY MALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.712
LIVER	12.81	4.495
KIDNEYS	2.71	0.951
SPLEEN	0.61	0.214
HEART	1.23	0.432
PROSTATE	0.59	0.207
EPIDIDYMIDES	0.78	0.274
TESTES	2.96	1.039
THYMUS	0.2242	0.079
ADRENAL GLANDS	0.0572	0.020
PITUITARY	0.0099	0.003
THYROIDS/PARATHY	0.0174	0.006
FINAL BODY WT(G)	285.	

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	LN, AXILLARY	SKIN- TREATED
	SKIN- UNTREATED			

GRADE

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 11

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90181 GROUP 1: UNTREATED FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.82	0.910
LIVER	7.15	3.575
KIDNEYS	1.86	0.930
SPLEEN	0.44	0.220
HEART	0.76	0.380
UTERUS	0.40	0.200
OVARIES/OVIDUCTS	0.1048	0.052
THYMUS	0.2873	0.144
ADRENAL GLANDS	0.0785	0.039
PITUITARY	0.0142	0.007
THYROIDS/PARATHY	0.0134	0.007
FINAL BODY WT(G)	200.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
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
	LN, AXILLARY	SKIN- TREATED	SKIN- UNTREATED	

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 12

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90186 GROUP 1: UNTREATED FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.950
LIVER	7.23	3.633
KIDNEYS	1.86	0.935
SPLEEN	0.45	0.226
HEART	0.89	0.447
UTERUS	0.34	0.171
OVARIES/OVIDUCTS	0.1210	0.061
THYMUS	0.3483	0.175
ADRENAL GLANDS	0.0673	0.034
PITUITARY	0.0150	0.008
THYROIDS/PARATHY	0.0140	0.007
FINAL BODY WT(G)	199.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

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
LN, AXILLARY	SKIN- TREATED	SKIN- UNTREATED	

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90180 GROUP 2: 0 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.80	0.968
LIVER	7.06	3.796
KIDNEYS	1.76	0.946
SPLEEN	0.41	0.220
HEART	0.81	0.435
UTERUS	0.73	0.392
OVARIES/OVIDUCTS	0.1071	0.058
THYMUS	0.2456	0.132
ADRENAL GLANDS	0.0708	0.038
PITUITARY	0.0118	0.006
THYROIDS/PARATHY	0.0167	0.009
FINAL BODY WT(G)	186.	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:				GRADE
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	
LN, AXILLARY	SKIN- TREATED	SKIN- UNTREATED		

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 14

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90185 GROUP 2: 0 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.79	0.865
LIVER	8.24	3.981
KIDNEYS	2.15	1.039
SPLEEN	0.40	0.193
HEART	0.88	0.425
UTERUS	0.43	0.208
OVARIES/OVIDUCTS	0.1586	0.077
THYMUS	0.2927	0.141
ADRENAL GLANDS	0.0686	0.033
PITUITARY	0.0161	0.008
THYROIDS/PARATHY	0.0126	0.006
FINAL BODY WT(G)	207.	

		GRADE
KIDNEYS	GROSS: DILATED PELVIS RIGHT	3
URETERS	GROSS: DISTENDED RIGHT	2
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNUM	FEMUR
JOINT	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	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	LN, AXILLARY
SKIN- TREATED	SKIN- UNTREATED		

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

ANIMAL NO. 90182 GROUP 3: 5 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.83	0.915
LIVER	8.50	4.250
KIDNEYS	1.70	0.850
SPLEEN	0.41	0.205
HEART	0.81	0.405
UTERUS	0.40	0.200
OVARIES/OVIDUCTS	0.1120	0.056
THYMUS	0.4277	0.214
ADRENAL GLANDS	0.0760	0.038
PITUITARY	0.0110	0.005
THYROIDS/PARATHY	0.0129	0.006
FINAL BODY WT(G)	200.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

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
LN, AXILLARY	SKIN- TREATED	SKIN- UNTREATED	

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 16

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90184 GROUP 3: 5 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.969
LIVER	7.53	3.862
KIDNEYS	1.55	0.795
SPLEEN	0.35	0.179
HEART	0.89	0.456
UTERUS	0.29	0.149
OVARIES/OVIDUCTS	0.0914	0.047
THYMUS	0.2631	0.135
ADRENAL GLANDS	0.0766	0.039
PITUITARY	0.0113	0.006
THYROIDS/PARATHY	0.0173	0.009
FINAL BODY WT(G)	195.	

KIDNEYS: NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS: AREA(S), DEPRESSED P
ONE, PINPOINT, IN CORTEX, RIGHT

GROSS:

ADRENAL GLANDS	AORTA	STERNUM	FEMUR
JOINT	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES	NERVES, OPTIC
HEART	ILEUM	JEJUNUM	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	LN, AXILLARY
SKIN- TREATED	SKIN- UNTREATED		

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 17

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90178 GROUP 4: 25 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.80	1.017
LIVER	8.27	4.672
KIDNEYS	1.57	0.887
SPLEEN	0.40	0.226
HEART	0.83	0.469
UTERUS	0.43	0.243
OVARIES/OVIDUCTS	0.0817	0.046
THYMUS	0.1863	0.105
ADRENAL GLANDS	0.0874	0.049
PITUITARY	0.0103	0.006
THYROIDS/PARATHY	0.0137	0.008
FINAL BODY WT(G)	177.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

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
LN, AXILLARY	SKIN- TREATED	SKIN- UNTREATED	

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 18

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90179 GROUP 4: 25 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.81	1.034
LIVER	7.39	4.223
KIDNEYS	1.57	0.897
SPLEEN	0.44	0.251
HEART	0.75	0.429
UTERUS	0.61	0.349
OVARIES/OVIDUCTS	0.0871	0.050
THYMUS	0.2419	0.138
ADRENAL GLANDS	0.0564	0.032
PITUITARY	0.0098	0.006
THYROIDS/PARATHY	0.0136	0.008
FINAL BODY WT(G)	175.	

UTERUS: NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS: CONTENTS, CLEAR FLUID BILATERAL P

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	VAGINA	CERVIX	LN, AXILLARY
SKIN- TREATED	SKIN- UNTREATED		

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

TABLE A10

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 19

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL MACROSCOPIC FINDINGS

ANIMAL NO. 90176 GROUP 5: 100 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.71	1.000
LIVER	9.76	5.708
KIDNEYS	1.66	0.971
SPLEEN	0.43	0.251
HEART	0.77	0.450
UTERUS	0.34	0.199
OVARIES/OVIDUCTS	0.0923	0.054
THYMUS	0.1051	0.061
ADRENAL GLANDS	0.0648	0.038
PITUITARY	0.0095	0.006
THYROIDS/PARATHY	0.0135	0.008
FINAL BODY WT(G)	171.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

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
	LN, AXILLARY	SKIN- TREATED	SKIN- UNTREATED	

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

ANIMAL NO. 90177 GROUP 5: 100 MG/KG/DAY FEMALE SCHEDULED EUTH 12/17/10 DATE OF DEATH: 12/17/10 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.960
LIVER	10.69	5.399
KIDNEYS	1.87	0.944
SPLEEN	0.51	0.258
HEART	0.88	0.444
UTERUS	0.42	0.212
OVARIES/OVIDUCTS	0.1209	0.061
THYMUS	0.1576	0.080
ADRENAL GLANDS	0.0701	0.035
PITUITARY	0.0121	0.006
THYROIDS/PARATHY	0.0178	0.009
FINAL BODY WT(G)	198.	

		GRADE
ADRENAL GLANDS	GROSS: AREA(S), DARK RED	P
	ONE, PINPOINT, LEFT	
LN, MANDIBULAR	GROSS: ENLARGED	P
	BILATERAL	
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

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	LN, AXILLARY
SKIN- TREATED	SKIN- UNTREATED		

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

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90165	299.	1.92	10.18	2.34	0.60	1.11	0.82
90167	271.	1.84	9.64	2.63	0.49	1.10	0.65
MEAN	285.	1.88	9.91	2.49	0.55	1.11	0.74
S.D.	19.8	0.057	0.382	0.205	0.078	0.007	0.120
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90169	262.	1.99	10.91	2.65	0.44	0.98	0.68
90172	254.	1.84	8.57	2.43	0.51	0.95	0.64
MEAN	258.	1.92	9.74	2.54	0.48	0.97	0.66
S.D.	5.7	0.106	1.655	0.156	0.049	0.021	0.028
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 3

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 5 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90171	308.	1.87	10.83	2.82	0.65	1.06	0.69
90174	317.	2.03	11.70	3.19	0.70	1.27	0.64
MEAN	313.	1.95	11.27	3.01	0.68	1.17	0.67
S.D.	6.4	0.113	0.615	0.262	0.035	0.148	0.035
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 25 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90175	281.	1.95	12.51	2.57	0.72	1.15	0.58
90219	256.	1.93	11.28	2.50	0.62	1.19	0.45
MEAN	269.	1.94	11.90	2.54	0.67	1.17	0.52
S.D.	17.7	0.014	0.870	0.049	0.071	0.028	0.092
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90166	266.	1.80	12.71	2.29	0.52	1.06	0.58
90221	285.	2.03	12.81	2.71	0.61	1.23	0.59
MEAN	276.	1.92	12.76	2.50	0.57	1.15	0.59
S.D.	13.4	0.163	0.071	0.297	0.064	0.120	0.007
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

MALE GROUP: UNTREATED

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90165	0.95	3.40	0.3995	0.0637	0.0118	0.0169
90167	0.76	3.02	0.2597	0.0664	0.0104	0.0167
MEAN	0.86	3.21	0.3296	0.0651	0.0111	0.0168
S.D.	0.134	0.269	0.09885	0.00191	0.00099	0.00014
N	2	2	2	2	2	2

MALE GROUP: 0 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90169	0.78	4.28	0.3640	0.0556	0.0098	0.0125
90172	0.75	2.92	0.2897	0.0443	0.0098	0.0151
MEAN	0.77	3.60	0.3269	0.0500	0.0098	0.0138
S.D.	0.021	0.962	0.05254	0.00799	0.00000	0.00184
N	2	2	2	2	2	2

MALE GROUP: 5 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90171	0.92	3.34	0.5263	0.0556	0.0118	0.0155
90174	0.80	3.09	0.3927	0.0760	0.0116	0.0147
MEAN	0.86	3.22	0.4595	0.0658	0.0117	0.0151
S.D.	0.085	0.177	0.09447	0.01442	0.00014	0.00057
N	2	2	2	2	2	2

MALE GROUP: 25 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90175	0.78	3.09	0.2367	0.0661	0.0091	0.0198
90219	0.72	2.96	0.1997	0.0562	0.0107	0.0141
MEAN	0.75	3.03	0.2182	0.0612	0.0099	0.0170
S.D.	0.042	0.092	0.02616	0.00700	0.00113	0.00403
N	2	2	2	2	2	2

MALE GROUP: 100 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90166	0.80	3.17	0.5976	0.0614	0.0086	0.0179
90221	0.78	2.96	0.2242	0.0572	0.0099	0.0174
MEAN	0.79	3.07	0.4109	0.0593	0.0093	0.0177
S.D.	0.014	0.148	0.26403	0.00297	0.00092	0.00035
N	2	2	2	2	2	2

FEMALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90181	200.	1.82	7.15	1.86	0.44	0.76
90186	199.	1.89	7.23	1.86	0.45	0.89
MEAN	200.	1.86	7.19	1.86	0.45	0.83
S.D.	0.7	0.049	0.057	0.000	0.007	0.092
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90180	186.	1.80	7.06	1.76	0.41	0.81
90185	207.	1.79	8.24	2.15	0.40	0.88
MEAN	197.	1.80	7.65	1.96	0.41	0.85
S.D.	14.8	0.007	0.834	0.276	0.007	0.049
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 13

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 5 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90182	200.	1.83	8.50	1.70	0.41	0.81
90184	195.	1.89	7.53	1.55	0.35	0.89
MEAN	198.	1.86	8.02	1.63	0.38	0.85
S.D.	3.5	0.042	0.686	0.106	0.042	0.057
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 25 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90178	177.	1.80	8.27	1.57	0.40	0.83
90179	175.	1.81	7.39	1.57	0.44	0.75
MEAN	176.	1.81	7.83	1.57	0.42	0.79
S.D.	1.4	0.007	0.622	0.000	0.028	0.057
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90176	171.	1.71	9.76	1.66	0.43	0.77
90177	198.	1.90	10.69	1.87	0.51	0.88
MEAN	185.	1.81	10.23	1.77	0.47	0.83
S.D.	19.1	0.134	0.658	0.148	0.057	0.078
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: UNTREATED

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90181	0.40	0.1048	0.2873	0.0785	0.0142	0.0134
90186	0.34	0.1210	0.3483	0.0673	0.0150	0.0140
MEAN	0.37	0.1129	0.3178	0.0729	0.0146	0.0137
S.D.	0.042	0.01146	0.04313	0.00792	0.00057	0.00042
N	2	2	2	2	2	2

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 17

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90180	0.73	0.1071	0.2456	0.0708	0.0118	0.0167
90185	0.43	0.1586	0.2927	0.0686	0.0161	0.0126
MEAN	0.58	0.1329	0.2692	0.0697	0.0140	0.0147
S.D.	0.212	0.03642	0.03330	0.00156	0.00304	0.00290
N	2	2	2	2	2	2

TABLE A11

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 18

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 5 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90182	0.40	0.1120	0.4277	0.0760	0.0110	0.0129
90184	0.29	0.0914	0.2631	0.0766	0.0113	0.0173
MEAN	0.35	0.1017	0.3454	0.0763	0.0112	0.0151
S.D.	0.078	0.01457	0.11639	0.00042	0.00021	0.00311
N	2	2	2	2	2	2

FEMALE GROUP: 25 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90178	0.43	0.0817	0.1863	0.0874	0.0103	0.0137
90179	0.61	0.0871	0.2419	0.0564	0.0098	0.0136
MEAN	0.52	0.0844	0.2141	0.0719	0.0101	0.0137
S.D.	0.127	0.00382	0.03932	0.02192	0.00035	0.00007
N	2	2	2	2	2	2

TABLE A11

PROJECT NO.:WIL-402019M | 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED | PAGE 20

SPONSOR:AMERICAN PETROLEUM | INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90176	0.34	0.0923	0.1051	0.0648	0.0095	0.0135
90177	0.42	0.1209	0.1576	0.0701	0.0121	0.0178
MEAN	0.38	0.1066	0.1314	0.0675	0.0108	0.0157
S.D.	0.057	0.02022	0.03712	0.00375	0.00184	0.00304
N	2	2	2	2	2	2

POFBWv4.25
12/29/2010

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90165	299.	0.642	3.405	0.783	0.201	0.371	0.274
90167	271.	0.679	3.557	0.970	0.181	0.406	0.240
MEAN	285.	0.660	3.480	0.880	0.190	0.390	0.260
S.D.	19.8	0.0260	0.1078	0.1328	0.0140	0.0245	0.0243
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90169	262.	0.760	4.164	1.011	0.168	0.374	0.260
90172	254.	0.724	3.374	0.957	0.201	0.374	0.252
MEAN	258.	0.740	3.770	0.980	0.180	0.370	0.260
S.D.	5.7	0.0248	0.5587	0.0387	0.0232	0.0001	0.0054
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 3

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 5 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90171	308.	0.607	3.516	0.916	0.211	0.344	0.224
90174	317.	0.640	3.691	1.006	0.221	0.401	0.202
MEAN	313.	0.620	3.600	0.960	0.220	0.370	0.210
S.D.	6.4	0.0235	0.1235	0.0642	0.0069	0.0399	0.0157
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 25 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90175	281.	0.694	4.452	0.915	0.256	0.409	0.206
90219	256.	0.754	4.406	0.977	0.242	0.465	0.176
MEAN	269.	0.720	4.430	0.950	0.250	0.440	0.190
S.D.	17.7	0.0424	0.0323	0.0438	0.0099	0.0393	0.0217
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90166	266.	0.677	4.778	0.861	0.195	0.398	0.218
90221	285.	0.712	4.495	0.951	0.214	0.432	0.207
MEAN	276.	0.690	4.640	0.910	0.200	0.420	0.210
S.D.	13.4	0.0252	0.2004	0.0636	0.0131	0.0234	0.0078
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: UNTREATED

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90165	0.318	1.137	0.134	0.021	0.004	0.006
90167	0.280	1.114	0.096	0.025	0.004	0.006
MEAN	0.300	1.130	0.115	0.023	0.004	0.006
S.D.	0.0264	0.0161	0.0267	0.0023	0.0001	0.0004
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 7

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 0 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90169	0.298	1.634	0.139	0.021	0.004	0.005
90172	0.295	1.150	0.114	0.017	0.004	0.006
MEAN	0.300	1.390	0.126	0.019	0.004	0.005
S.D.	0.0017	0.3422	0.0176	0.0027	0.0001	0.0008
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 8

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 5 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90171	0.299	1.084	0.171	0.018	0.004	0.005
90174	0.252	0.975	0.124	0.024	0.004	0.005
MEAN	0.280	1.030	0.147	0.021	0.004	0.005
S.D.	0.0328	0.0775	0.0332	0.0042	0.0001	0.0003
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 9

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 25 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90175	0.278	1.100	0.084	0.024	0.003	0.007
90219	0.281	1.156	0.078	0.022	0.004	0.005
MEAN	0.280	1.130	0.081	0.023	0.004	0.006
S.D.	0.0026	0.0400	0.0044	0.0011	0.0007	0.0011
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 10

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 100 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90166	0.301	1.192	0.225	0.023	0.003	0.007
90221	0.274	1.039	0.079	0.020	0.003	0.006
MEAN	0.290	1.120	0.152	0.022	0.003	0.006
S.D.	0.0191	0.1083	0.1032	0.0021	0.0002	0.0004
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 11

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90181	200.	0.910	3.575	0.930	0.220	0.380
90186	199.	0.950	3.633	0.935	0.226	0.447
MEAN	200.	0.930	3.600	0.930	0.220	0.410
S.D.	0.7	0.0281	0.0411	0.0033	0.0043	0.0475
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90180	186.	0.968	3.796	0.946	0.220	0.435
90185	207.	0.865	3.981	1.039	0.193	0.425
MEAN	197.	0.920	3.890	0.990	0.210	0.430
S.D.	14.8	0.0728	0.1308	0.0653	0.0192	0.0073
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 5 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90182	200.	0.915	4.250	0.850	0.205	0.405
90184	195.	0.969	3.862	0.795	0.179	0.456
MEAN	198.	0.940	4.060	0.820	0.190	0.430
S.D.	3.5	0.0383	0.2747	0.0390	0.0180	0.0364
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 14

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 25 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90178	177.	1.017	4.672	0.887	0.226	0.469
90179	175.	1.034	4.223	0.897	0.251	0.429
MEAN	176.	1.030	4.450	0.890	0.240	0.450
S.D.	1.4	0.0123	0.3178	0.0072	0.0180	0.0285
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	SPLEEN	HEART
90176	171.	1.000	5.708	0.971	0.251	0.450
90177	198.	0.960	5.399	0.944	0.258	0.444
MEAN	185.	0.980	5.550	0.960	0.250	0.450
S.D.	19.1	0.0286	0.2182	0.0186	0.0043	0.0041
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 16

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: UNTREATED

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90181	0.200	0.052	0.144	0.039	0.007	0.007
90186	0.171	0.061	0.175	0.034	0.008	0.007
MEAN	0.190	0.057	0.159	0.036	0.007	0.007
S.D.	0.0206	0.0059	0.0222	0.0038	0.0003	0.0002
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 17

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90180	0.392	0.058	0.132	0.038	0.006	0.009
90185	0.208	0.077	0.141	0.033	0.008	0.006
MEAN	0.300	0.067	0.137	0.036	0.007	0.008
S.D.	0.1306	0.0135	0.0066	0.0035	0.0010	0.0021
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 18

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 5 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90182	0.200	0.056	0.214	0.038	0.005	0.007
90184	0.149	0.047	0.135	0.039	0.006	0.009
MEAN	0.170	0.051	0.174	0.039	0.006	0.008
S.D.	0.0363	0.0065	0.0558	0.0009	0.0002	0.0017
N	2	2	2	2	2	2

FEMALE GROUP: 25 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90178	0.243	0.046	0.105	0.049	0.006	0.008
90179	0.349	0.050	0.138	0.032	0.006	0.008
MEAN	0.300	0.048	0.122	0.041	0.006	0.008
S.D.	0.0747	0.0026	0.0233	0.0121	0.0002	0.0001
N	2	2	2	2	2	2

TABLE A12

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 20

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90176	0.199	0.054	0.061	0.038	0.006	0.008
90177	0.212	0.061	0.080	0.035	0.006	0.009
MEAN	0.210	0.058	0.071	0.037	0.006	0.009
S.D.	0.0094	0.0050	0.0128	0.0018	0.0004	0.0008
N	2	2	2	2	2	2

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TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 1

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90165	299.	1.92	530.208	121.875	31.250	57.813	42.708
90167	271.	1.84	523.913	142.935	26.630	59.783	35.326
MEAN	285.	1.88	527.060	132.400	28.940	58.800	39.020
S.D.	19.8	0.057	4.4484	14.8915	3.2665	1.3931	5.2200
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 2

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90169	262.	1.99	548.241	133.166	22.111	49.246	34.171
90172	254.	1.84	465.761	132.065	27.717	51.630	34.783
MEAN	258.	1.92	507.000	132.620	24.910	50.440	34.480
S.D.	5.7	0.106	58.3226	0.7777	3.9646	1.6858	0.4326
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 3

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 5 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90171	308.	1.87	579.144	150.802	34.759	56.684	36.898
90174	317.	2.03	576.355	157.143	34.483	62.562	31.527
MEAN	313.	1.95	577.750	153.970	34.620	59.620	34.210
S.D.	6.4	0.113	1.9753	4.4836	0.1954	4.1557	3.7981
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 4

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 25 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90175	281.	1.95	641.538	131.795	36.923	58.974	29.744
90219	256.	1.93	584.456	129.534	32.124	61.658	23.316
MEAN	269.	1.94	613.000	130.660	34.520	60.320	26.530
S.D.	17.7	0.014	40.3635	1.5985	3.3932	1.8977	4.5449
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 5

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART	PROSTATE
90166	266.	1.80	706.111	127.222	28.889	58.889	32.222
90221	285.	2.03	631.035	133.498	30.049	60.591	29.064
MEAN	276.	1.92	668.570	130.360	29.470	59.740	30.640
S.D.	13.4	0.163	53.0870	4.4372	0.8205	1.2037	2.2332
N	2	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 6

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: UNTREATED

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90165	49.479	177.083	20.807	3.318	0.615	0.880
90167	41.304	164.130	14.114	3.609	0.565	0.908
MEAN	45.390	170.610	17.461	3.463	0.590	0.894
S.D.	5.7805	9.1591	4.7328	0.2058	0.0349	0.0194
N	2	2	2	2	2	2

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 7

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 0 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90169	39.196	215.075	18.291	2.794	0.492	0.628
90172	40.761	158.696	15.745	2.408	0.533	0.821
MEAN	39.980	186.890	17.018	2.601	0.512	0.724
S.D.	1.1065	39.8665	1.8009	0.2732	0.0284	0.1362
N	2	2	2	2	2	2

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 8

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 5 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90171	49.198	178.610	28.144	2.973	0.631	0.829
90174	39.409	152.217	19.345	3.744	0.571	0.724
MEAN	44.300	165.410	23.745	3.359	0.601	0.776
S.D.	6.9219	18.6626	6.2222	0.5449	0.0421	0.0741
N	2	2	2	2	2	2

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 9

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

MALE GROUP: 25 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90175	40.000	158.462	12.138	3.390	0.467	1.015
90219	37.306	153.368	10.347	2.912	0.554	0.731
MEAN	38.650	155.910	11.243	3.151	0.511	0.873
S.D.	1.9052	3.6016	1.2666	0.3379	0.0620	0.2014
N	2	2	2	2	2	2

MALE GROUP: 100 MG/KG/DAY

ANIMAL	EPIDIDYMIDES	TESTES	THYMUS	ADRENAL GLANDS	PITUITARY	THYROIDS/PARATHY
90166	44.444	176.111	33.200	3.411	0.478	0.994
90221	38.424	145.813	11.044	2.818	0.488	0.857
MEAN	41.430	160.960	22.122	3.114	0.483	0.926
S.D.	4.2573	21.4242	15.6664	0.4196	0.0070	0.0971
N	2	2	2	2	2	2

FEMALE GROUP: UNTREATED

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
90181	200.	1.82	392.857	102.198	24.176	41.758
90186	199.	1.89	382.540	98.413	23.810	47.090
MEAN	200.	1.86	387.700	100.310	23.990	44.420
S.D.	0.7	0.049	7.2959	2.6766	0.2589	3.7701
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 12

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
90180	186.	1.80	392.222	97.778	22.778	45.000
90185	207.	1.79	460.335	120.112	22.346	49.162
MEAN	197.	1.80	426.280	108.940	22.560	47.080
S.D.	14.8	0.007	48.1632	15.7925	0.3051	2.9430
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 13

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 5 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
90182	200.	1.83	464.481	92.896	22.404	44.262
90184	195.	1.89	398.413	82.011	18.519	47.090
MEAN	198.	1.86	431.450	87.450	20.460	45.680
S.D.	3.5	0.042	46.7171	7.6972	2.7477	1.9995
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 14

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 25 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
90178	177.	1.80	459.444	87.222	22.222	46.111
90179	175.	1.81	408.287	86.740	24.309	41.436
MEAN	176.	1.81	433.870	86.980	23.270	43.770
S.D.	1.4	0.007	36.1736	0.3407	1.4759	3.3055
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 15

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	FBW(G)	BRAIN WT (GRAMS)	LIVER	KIDNEYS	SPLEEN	HEART
90176	171.	1.71	570.760	97.076	25.146	45.029
90177	198.	1.90	562.632	98.421	26.842	46.316
MEAN	185.	1.81	566.700	97.750	25.990	45.670
S.D.	19.1	0.134	5.7473	0.9514	1.1992	0.9097
N	2	2	2	2	2	2

FBW = FINAL BODY WEIGHT

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 16

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: UNTREATED

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90181	21.978	5.758	15.786	4.313	0.780	0.736
90186	17.989	6.402	18.429	3.561	0.794	0.741
MEAN	19.980	6.080	17.107	3.937	0.787	0.738
S.D.	2.8204	0.4553	1.8688	0.5320	0.0095	0.0031
N	2	2	2	2	2	2

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 17

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 0 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90180	40.556	5.950	13.644	3.933	0.656	0.928
90185	24.022	8.860	16.352	3.832	0.899	0.704
MEAN	32.290	7.405	14.998	3.883	0.777	0.816
S.D.	11.6907	2.0579	1.9145	0.0714	0.1725	0.1583
N	2	2	2	2	2	2

TABLE A13

PROJECT NO.:WIL-402019M 14-DAY RAT DERMAL STUDY OF CLARIFIED OILS, CATALYTIC CRACKED PAGE 18

SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 5 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90182	21.858	6.120	23.372	4.153	0.601	0.705
90184	15.344	4.836	13.921	4.053	0.598	0.915
MEAN	18.600	5.478	18.646	4.103	0.600	0.810
S.D.	4.6061	0.9081	6.6828	0.0708	0.0023	0.1488
N	2	2	2	2	2	2

TABLE A13

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SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 25 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90178	23.889	4.539	10.350	4.856	0.572	0.761
90179	33.702	4.812	13.365	3.116	0.541	0.751
MEAN	28.800	4.675	11.857	3.986	0.557	0.756
S.D.	6.9387	0.1932	2.1317	1.2300	0.0218	0.0069
N	2	2	2	2	2	2

TABLE A13

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SPONSOR:AMERICAN PETROLEUM INDIVIDUAL ORGAN WEIGHTS RELATIVE TO BRAIN WEIGHTS [G/100 G]

FEMALE GROUP: 100 MG/KG/DAY

ANIMAL	UTERUS	OVARIES/ OVIDUCTS	THYMUS	ADRENAL GLANDS	PITU ITARY	THYROIDS /PARATHY
90176	19.883	5.398	6.146	3.789	0.556	0.789
90177	22.105	6.363	8.295	3.689	0.637	0.937
MEAN	20.990	5.880	7.220	3.740	0.596	0.863
S.D.	1.5714	0.6827	1.5192	0.0707	0.0575	0.1042
N	2	2	2	2	2	2

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