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Alameda County
Environmental Health

November 15, 1994

Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Attention: Mr. David B. DeWitt

RE: Corrective Action Plan - Abbreviated
Unocal Service Station #5043
449 Hegenberger Road
Oakland, California

FILE # 5043 SS BP _____
DPT QM _____ TRANSMITTAL _____
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

Dear Mr. DeWitt:

I. INTRODUCTION

Per your request and in accordance with the October 21, 1994, meeting between representatives of the Alameda County Health Care Services (ACHCS) Agency, Unocal Corporation, and Kaprealian Engineering, Inc. (KEI), KEI has prepared the following abbreviated Corrective Action Plan (CAP) for the subject site. This CAP has been prepared based on the guidelines presented in the California Code of Regulations, Title 23, Article II, Section 2725, Subsection (d).

II. BACKGROUND INFORMATION

The subject site currently contains an operating service station facility. A dispenser island modification project was conducted in October of 1991. The waste oil tank was removed from the site in September of 1994. Six monitoring wells have been installed at the site.

A site description, detailed background information including a summary of all of the work conducted to date, site hydrogeologic conditions, and tables that summarize all of the soil and ground water sample analytical results are presented in KEI's report (KEI-P91-1004.R5) dated October 7, 1994, and MPDS Services, Inc's. report (MPDS-UN5043-03) dated September 13, 1994.

III. IMPACT ASSESSMENT

PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE CONTAMINANT(S)

Based on KEI's investigation conducted to date, the predominant contaminant at the site is gasoline. Diesel has also been detected at the site. Material Safety Data Sheets for

regular unleaded gasoline, super unleaded gasoline, and diesel fuel are attached to this CAP as Appendix A. These Material Safety Data Sheets describe the physical and chemical characteristics of these grades of Unocal gasolines and diesel fuel.

SITE HYDROGEOLOGIC CHARACTERISTICS

The site is situated a few feet above Mean Sea Level on the eastern margin of San Francisco Bay in an area of relatively flat topography. The site is located approximately 4,000 feet southeast of San Leandro Bay, approximately 3,700 feet northeast of the Airport Channel, and approximately 1,250 feet northeast of the drainage channel of San Leandro Creek.

Based on review of regional geologic maps (U.S. Geological Survey Professional Paper 943 "Flatland Deposits - Their Geology and Engineering Properties and their Importance to Comprehensive Planning" by E.J. Helley and K.R. Lajoie, 1979), the subject site is underlain by Holocene-age Bay Mud (Qhbm). The Bay Mud typically consists of unconsolidated, saturated clay and silty clay that is rich in organic material. The Bay Mud locally contains lenses and stringers of well-sorted silt, sand, and beds of peat.

The results of our subsurface studies to date (the borings for wells MW1 through MW6) indicate that the site is underlain by artificial fill materials that extend to approximately 2 to 4 feet below grade. The fill materials are underlain by Bay Mud, which consists predominantly of organic-rich silty clay and clayey silt, with minor interbeds of sand, peat, sandy silt, and silty clay. The unsaturated zone (in August 1994) at the site ranges between approximately 3 and 6 feet in thickness.

A representative soil sample of the saturated zone was collected from MW5 at a depth of 9 feet below grade. The sample was submitted to Harlan Tait & Associates of San Francisco for particle size analysis (sieve and hydrometer analysis) for verification of casing slot size and filter pack design. The results of the analysis indicated that the sample is composed of approximately 70% clay, 27% silt, and 3% fine-grained sand. The sample is classified as an organic clay with silt (OH).

In the previous eight quarters (two hydrologic cycles) of monitoring and sampling, free phase product has been detected in MW1 at thicknesses ranging from <0.01 feet to 0.33 feet. However, free product bailing and well purging appears to

have reduced the presence of free product. Free product was also detected on one occasion in MW2 (February 7, 1994) at a thickness of less than 0.01 feet. Free product has not been detected in any other well at the subject site.

It is important to note that MW1 and MW2 are located adjacent to the dispenser islands. As previously noted, significant soil contamination was detected in this area during the 1991 island modifications. Contaminated soil was excavated from the dispenser island area to a depth of approximately 4.5 feet below grade (ground water depth).

The analytical results of the ground water samples collected at the site to date indicate that the concentrations of dissolved hydrocarbons reduce significantly away from the dispenser islands. For the previous five quarters, benzene has been non-detectable in well MW4, located farthest from the dispenser islands. The analytical results of the ground water samples collected to date are presented in Appendix B.

EXISTING AND POTENTIAL BENEFICIAL USES

Surface Waters

As stated previously, the Unocal service station is located approximately 4,000 feet southeast of San Leandro Bay, approximately 3,700 feet northeast of the Airport Channel, and approximately 1,250 feet northeast of the drainage channel of San Leandro Creek. These are the only significant bodies of surface water within an one-mile radius of the site. San Leandro Bay and the Airport Channel are a part of the "Lower Bay" portion of San Francisco Bay. Amongst the bodies noted above, the Lower Bay and San Leandro Creek are listed as having existing and potential beneficial uses in the Water Quality Control Plan for the Regional Water Quality Control Board (RWQCB), San Francisco Bay Basin (Basin Plan). According to the information contained in the above-referenced Basin Plan, the existing and potential beneficial uses of the Lower Bay are as follows:

- Industrial Service Supply
- Navigation
- Water Contact Recreation
- Non-Contact Water Recreation
- Ocean Commercial and Sport Fishing
- Wildlife Habitat
- Preservation of Rare and Endangered Species
- Fish Migration
- Fish Spawning

- Shellfish Harvesting
- Estuarine Habitat

The San Leandro Creek has several existing and potential beneficial uses that include:

- Water Contact Recreation
- Ocean Commercial and Sport Fishing
- Warm Fresh Water Habitat
- Preservation of Areas of Special Biological Significance
- Wildlife Habitat
- Marine Habitat
- Shellfish Harvesting
- Estuarine Habitat

No discharges (past or present) to surface waters at the subject Unocal site are known to KEI.

Ground Water

Ground water samples collected from the site on November 30, 1992, were analyzed for total dissolved solids (TDS). The analytical results indicated concentrations of TDS ranging from 3,800 mg/L to 9,800 mg/L. The analytical results of these ground water samples are presented in Appendix B.

As specified in State Water Resources Control Board, Resolution 88-63, the maximum concentration of TDS for surface and ground waters of the State in order to be considered to be suitable, or potentially suitable, for municipal or domestic water supply, is 3,000 mg/L. Therefore, based on the concentrations of TDS previously detected, the ground water at the subject site is not considered suitable or potentially suitable for domestic or municipal supply.

Potential Effects of Residual Contamination

Based on the information presented in the preceding sections, including the relative distances to nearby surface waters, the fact that the concentrations of dissolved hydrocarbons reduce significantly with lateral distance, and the fact that the ground water is not considered suitable for domestic or municipal supply, the potential for residual contamination from the Unocal site to affect nearby surface or ground water appear to be relatively limited.

It is KEI's understanding that drinking water for this area is supplied by an outside source.

IV. FEASIBILITY STUDIES

At Unocal's direction, KEI plans to conduct the following feasibility studies to assess the effectiveness of two of the currently available remedial techniques at the subject site. The two techniques were selected based upon the operating business at the site and the known contaminant source.

- **Vapor Extraction Pilot Test:** KEI will conduct a vapor extraction pilot test at the site to determine the feasibility of vapor extraction.
- **Slug/Water Recovery Tests:** KEI will conduct a series of modified slug/water recovery tests in order to determine if ground water pump-and-treat is a feasible technique. If the tests indicate favorable hydraulic conductivity, an aquifer test well will be installed and an aquifer pump test will also be conducted at the subject site.

Based on KEI's review of subsurface conditions that exist at the site, and our experience at sites within similar hydrogeologic settings, it is KEI's technical opinion that vapor extraction and ground water pump-and-treat techniques will most likely not be cost effective or technically feasible, and that soil excavation and ground water extraction from the open excavations will be the most effective method of contaminant source and free product removal.

V. CLEAN-UP LEVELS

Based on the elevated levels of TDS that have been measured in the wells to date and the apparent lack of resultant uses of the aquifer, it is the current plan to concentrate on the removal of free product at the site. Further recommendations pertaining to the remediation of dissolved hydrocarbon concentrations will be made subsequent to the evaluation of the results of the proposed pilot tests and subsequent to the installation of the proposed monitoring wells.

VI. INTERIM REMEDIAL ACTION PLAN

KEI will continue with the current course of interim methods of remediation at the subject site, which include:

- A surface skimming free product recovery device was installed in monitoring well MW1 in August of 1992. The device is designed to continuously skim free product from the water table in the vicinity of this well. Free product is removed from the device during the monthly

monitoring events. Quantities of product collected are presented in MPDS Services, Inc's. quarterly monitoring and sampling data reports.

- Monthly purging of monitoring wells MW1 and MW2 was initiated in May of 1994, and will continue.
- Four additional monitoring wells have previously been proposed at and in the vicinity of the site. The wells were proposed in order to further define the extent of hydrocarbon contamination at the site. KEI has applied for the necessary well permits and encroachment permits. In addition, Unocal is in the process of negotiating access agreements with the off-site property owner for two of the wells. The proposed wells will be installed following to the approval of the subject permits and access agreements. The locations of the proposed wells are shown on the attached Figure 1.
- The waste oil tank and hydraulic hoists were removed from the site in September of 1994. Hydrocarbon contaminated soils that were excavated from these areas were properly disposed. Underground storage tank and product piping replacement at the site is planned by Unocal for the first quarter of 1995. At this time, hydrocarbon contaminated soils will be excavated and properly disposed. In addition, ground water will be pumped from the open excavations and properly disposed. These activities will be conducted in an attempt to remove as much as possible of the contaminant source and any free product.

DISTRIBUTION

A copy of this CAP should be sent to Mr. Barney Chan of the ACHCS.

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants. Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

Mr. David B. DeWitt
Unocal Corporation

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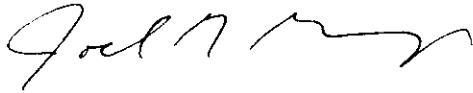
November 15, 1994

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state-certified laboratory. We have analyzed this data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, regarding the above, including laboratory analyses, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

Should you have any questions, please do not hesitate to call me at (510) 602-5100.

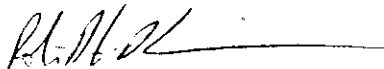
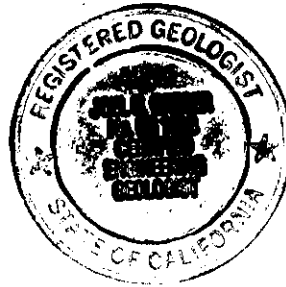
Sincerely,

Kaprealian Engineering, Inc.



Joel G. Greger, C.E.G.
Senior Engineering Geologist

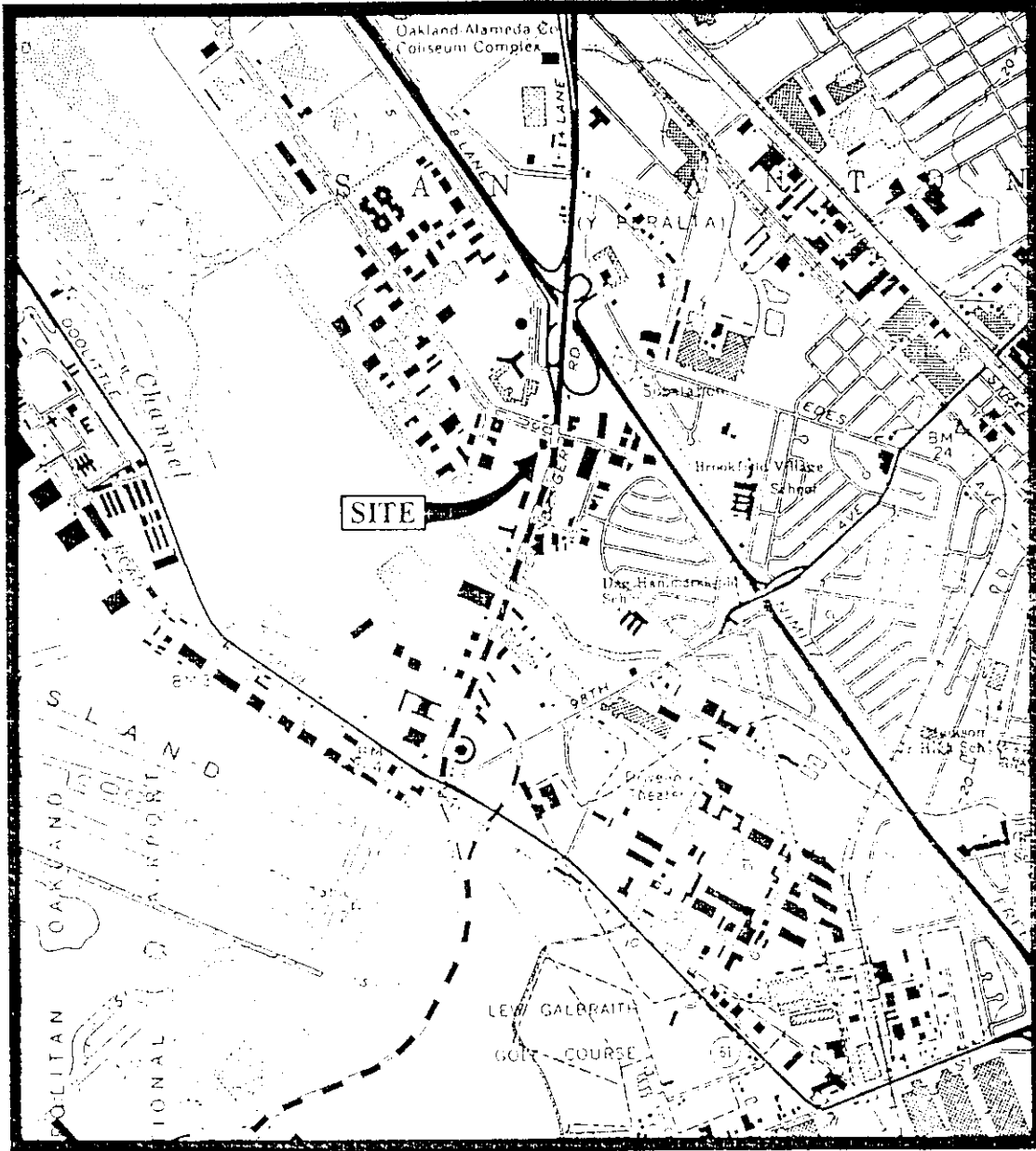
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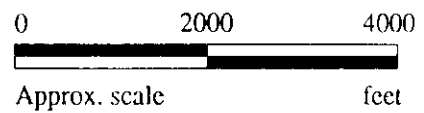
Robert H. Kezerian
Project Manager


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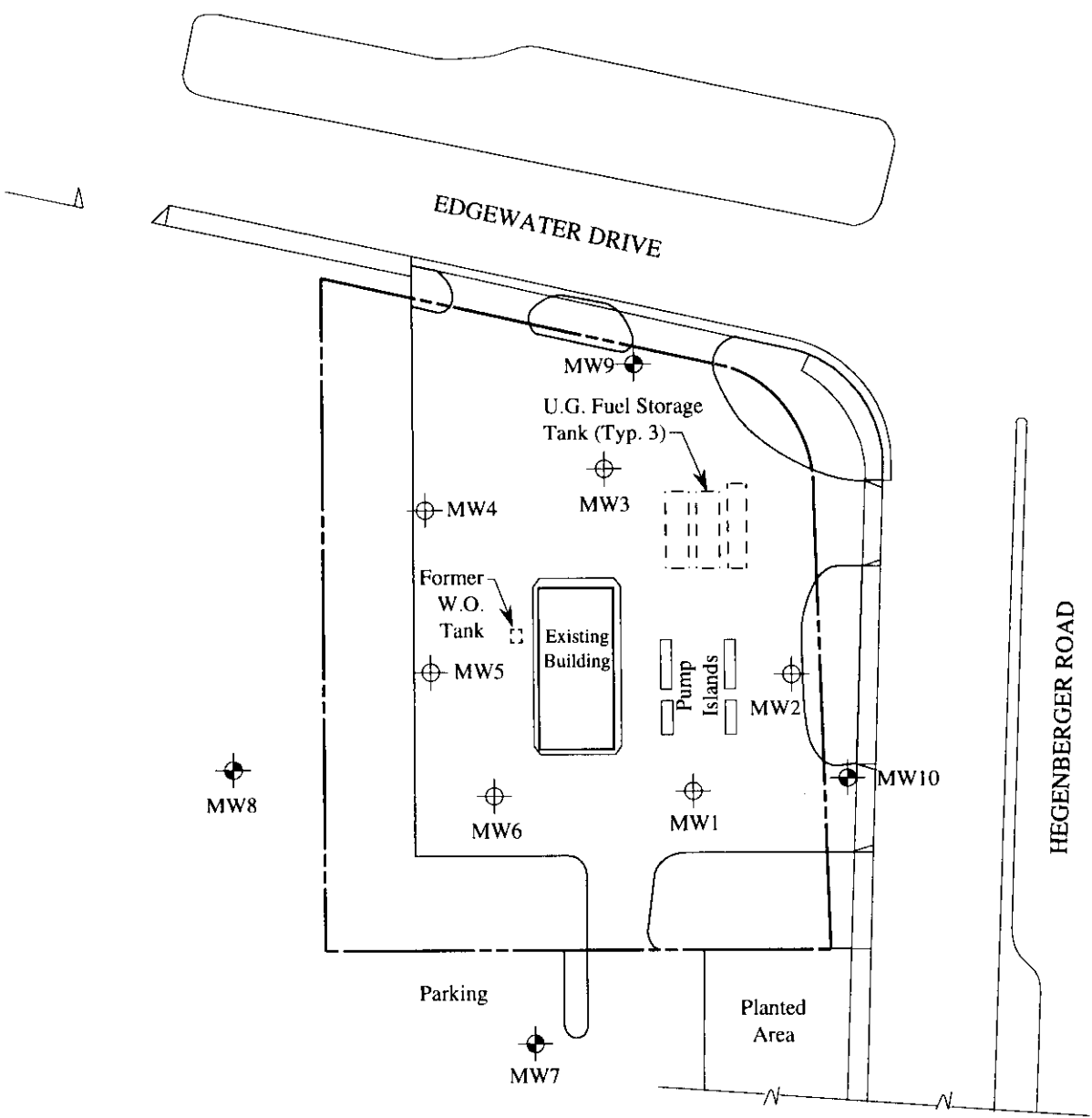
Attachments: Location Map
Figure 1
Appendices A & B



Base modified from 7.5 minute U.S.G.S. San Leandro Quadrangle
(photorevised 1980)

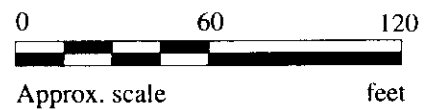


 <p>KAPREALIAN ENGINEERING INCORPORATED</p>	<p>UNOCAL SERVICE STATION #5043 449 HEGENBERGER ROAD OAKLAND, CALIFORNIA</p>	<p>LOCATION MAP</p>
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LEGEND

- ⊕ Monitoring well (existing)
- Monitoring well (proposed)



EXISTING AND PROPOSED MONITORING WELL LOCATION MAP



**UNOCAL SERVICE STATION #5043
449 HEGENBERGER ROAD
OAKLAND, CALIFORNIA**

**FIGURE
1**

APPENDIX A

MATERIAL SAFETY DATA SHEET

1
1
1

1201 West 5th Street
Los Angeles, California 90017

Product Name: UNOCAL HIGH PERFORMANCE 92
Product Code No: 00901
Page 1
Issue Date: 04/17/91
Status: FINAL

Responsible Party: UNOCAL REFINING & MARKETING DIVISION UNION OIL COMPANY OF CALIFORNIA 1201 WEST 5TH STREET LOS ANGELES, CALIFORNIA 90017 CONTACT FOR FURTHER INFORMATION: MSDS COORDINATOR 213-977-7589	Transportation Emergencies: CHEMTREC (800) 424-9300 Cont. U.S. (202) 483-7616 (Collect) from Alaska & Hawaii Health Emergencies: LOS ANGELES POISON CONTROL CENTER (24 hrs) (800) 356-3129
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PRODUCT IDENTIFICATION

1 PRODUCT NAME: UNOCAL HIGH PERFORMANCE 92
1 GENERIC NAME: UNLEADED GASOLINE
1 CHEMICAL FAMILY: PETROLEUM HYDROCARBON MIXTURE
1 DOT PROPER
1 SHIPPING NAME: GASOLINE
1 ID NUMBER: UN1203
1 DOT HAZARD
1 CLASSIFICATION: FLAMMABLE LIQUID

PRECAUTIONARY WARNING

1 DANGER|
EXTREMELY FLAMMABLE. VAPORS MAY EXPLODE. HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL. POSSIBLE CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS. ASPIRATION HAZARD IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. NO SMOKING OR OPEN FLAME. KEEP AWAY FROM HEAT, SPARKS, FLAMES OR OTHER SOURCES OF IGNITION (e.g. STATIC ELECTRICITY, PILOT LIGHTS OR MECHANICAL/ELECTRICAL EQUIPMENT). VAPORS MAY BE IGNITED BY SPARK OR FLAME SOURCE MANY FEET AWAY. DO NOT OVERFILL TANK. USE ONLY WITH ADEQUATE VENTILATION. DO NOT TASTE OR SWALLOW. DO NOT BREATHE VAPOR OR MIST. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. WASH THOROUGHLY AFTER HANDLING. NEVER SIPHON BY MOUTH. FOR USE AS MOTOR FUEL ONLY. DO NOT USE FOR ANY OTHER PURPOSE. KEEP CONTAINER CLOSED. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, GRIND OR DRILL ON OR NEAR CONTAINER. "EMPTY" CONTAINER RETAINS RESIDUE (LIQUID AND/OR VAPOR) AND MAY EXPLODE IN HEAT OF A FIRE. KEEP OUT OF REACH OF CHILDREN. FAILURE TO USE CAUTION MAY CAUSE SERIOUS INJURY OR ILLNESS.

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
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1 HAZARDOUS COMPONENTS

GASOLINE CAS #: 8006-61-9		300.000	ppm	ACGIH	TWA
		500.000	ppm	ACGIH	STEL
		300.000	ppm	OSHA	TWA
		500.000	ppm	OSHA	STEL
		300.000	ppm	CAL OSHA	TWA

UNION OIL CO.

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SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
BENZENE CAS #: 71-43-2	1.000 - 5.000	10.000 25.000 1.000 5.000 50.000 25.000 10.000	ppm ppm ppm ppm ppm ppm ppm	ACGIH MSHA OSHA OSHA CAL OSHA CAL OSHA CAL OSHA	TWA CEIL-SKIN TWA STEL CEIL EXCUR TWA-SKIN
TOLUENE CAS #: 108-88-3	1.000 - 9.000	100.000 150.000 100.000 100.000 150.000 200.000 100.000 500.000	ppm ppm ppm ppm ppm ppm ppm ppm	ACGIH ACGIH MSHA OSHA OSHA CAL OSHA CAL OSHA CAL OSHA	TWA STEL TWA TWA STEL EXCUR TWA-SKIN CEIL-SKIN
XYLENES CAS #: 1330-20-7	1.000 - 14.000	100.000 150.000 100.000 100.000 150.000 200.000 100.000 300.000	ppm ppm ppm ppm ppm ppm ppm ppm	ACGIH ACGIH MSHA OSHA OSHA CAL OSHA CAL OSHA CAL OSHA	TWA STEL TWA TWA STEL EXCUR TWA-SKIN CEIL-SKIN
N-HEXANE CAS #: 110-54-3		50.000 500.000 50.000 50.000	ppm ppm ppm ppm	ACGIH MSHA OSHA CAL OSHA	TWA TWA TWA TWA
ETHYLBENZENE CAS #: 100-41-4	1.000 - 5.000	100.000 125.000 100.000 100.000 125.000 100.000	ppm ppm ppm ppm ppm ppm	ACGIH ACGIH MSHA OSHA OSHA CAL OSHA	TWA STEL TWA TWA STEL TWA
1,2,4-TRIMETHYLBENZENE CAS #: 95-63-6	1.000 - 5.000				NOT ESTABLISHED

1 OTHER COMPONENTS

--NONE--

1 THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING
 1 REQUIREMENTS OF SARA 313 AND 40 CFR 372:

	CAS NUMBER	WEIGHT %
BENZENE	71-43-2	1-5
TOLUENE	108-88-3	1-9
XYLENES	1330-20-7	1-14
ETHYLBENZENE	100-41-4	1-5
METHYL TERT-BUTYL ETHER	1634-04-4	0-10
1,2,4-TRIMETHYLBENZENE	95-63-6	1-5

UNION OIL CO.

Product Name: UNOCAL HIGH PERFORMANCE 92
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SECTION II - EMERGENCY AND FIRST AID PROCEDURES ***EMERGENCY***
 Have physician call LOS ANGELES POISON
 CONTROL CENTER (24 hrs) (800) 356-3129

1 EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

1 SKIN CONTACT:

WIPE MATERIAL FROM SKIN AND REMOVE CONTAMINATED SHOES AND CLOTHING. CLEANSE AFFECTED AREA(S) THOROUGHLY BY WASHING WITH MILD SOAP AND WATER AND, IF NECESSARY, A WATERLESS SKIN CLEANSER. IF IRRITATION OR REDNESS DEVELOPS AND PERSISTS, SEEK MEDICAL ATTENTION.

1 INHALATION (BREATHING):

IF RESPIRATORY SYMPTOMS OR OTHER SYMPTOMS OF EXPOSURE DEVELOP, MOVE VICTIM AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF SYMPTOMS PERSIST, SEEK IMMEDIATE MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. IF BREATHING DIFFICULTIES DEVELOP, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

1 INGESTION (SWALLOWING):

ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. IF VICTIM IS DROWSY OR UNCONSCIOUS, PLACE ON THE LEFT SIDE WITH THE HEAD DOWN. IF POSSIBLE, DO NOT LEAVE VICTIM UNATTENDED. SEEK MEDICAL ATTENTION.

1 COMMENTS:

NOTE TO PHYSICIANS: EXPOSURE TO HIGH CONCENTRATIONS OF THIS MATERIAL (e.g. IN ENCLOSED SPACES OR WITH DELIBERATE ABUSE) MAY BE ASSOCIATED WITH CARDIAC ARRHYTHMIAS. EPINEPHRINE AND OTHER SYMPATHOMIMETIC DRUGS MAY INITIATE CARDIAC ARRHYTHMIAS IN PERSONS EXPOSED TO THIS MATERIAL. OTHER DRUGS WITH LESS ARRHYTHMOGENIC POTENTIAL SHOULD BE CONSIDERED. IF SYMPATHOMIMETIC DRUGS ARE ADMINISTERED, OBSERVE FOR THE DEVELOPMENT OF CARDIAC ARRHYTHMIAS.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

1 EYE CONTACT:

THIS MATERIAL MAY CAUSE MILD EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID OR EXPOSURE TO VAPORS OR MISTS MAY CAUSE STINGING, TEARING AND REDNESS.

1 SKIN CONTACT:

THIS MATERIAL MAY CAUSE MILD SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY CAUSE REDNESS, BURNING, AND DRYING AND CRACKING OF THE SKIN. CONTACT MAY RESULT IN SKIN ABSORPTION BUT SYMPTOMS OF TOXICITY ARE NOT ANTICIPATED BY THIS ROUTE ALONE UNDER NORMAL CONDITIONS OF USE. PERSONS WITH PRE-EXISTING SKIN DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

1 INHALATION (BREATHING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, BREATHING HIGH CONCENTRATIONS OF VAPORS OR MISTS MAY CAUSE FLUSHING, BLURRED VISION, NAUSEA AND SIGNS OF NERVOUS SYSTEM DEPRESSION (e.g. HEADACHE, DROWSINESS, DIZZINESS, LOSS OF COORDINATION AND FATIGUE). EXPOSURE TO HIGH CONCENTRATIONS MAY CAUSE LOSS OF CONSCIOUSNESS, CONVULSIONS, RESPIRATORY COLLAPSE AND DEATH. RESPIRATORY SYMPTOMS ASSOCIATED WITH PRE-EXISTING LUNG DISORDERS (e.g. ASTHMA-LIKE CONDITIONS) MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.

UNION OIL CO.

Product Name: UNOCAL HIGH PERFORMANCE 92
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SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

1 INGESTION (SWALLOWING):

ASPIRATION HAZARD - THIS MATERIAL CAN ENTER LUNGS DURING SWALLOWING OR VOMITING AND CAUSE LUNG INFLAMMATION AND DAMAGE. INGESTION OF EXCESSIVE QUANTITIES OF THIS MATERIAL MAY CAUSE IRRITATION OF THE DIGESTIVE TRACT AND SIGNS OF NERVOUS SYSTEM DEPRESSION (e.g. HEADACHE, DROWSINESS, DIZZINESS, LOSS OF COORDINATION, AND FATIGUE).

1 COMMENTS:

GASOLINE IS A POSSIBLE CANCER HAZARD BASED ON TESTS IN LABORATORY ANIMALS. FOLLOW-UP STUDIES SUGGEST THAT THIS MAY BE A UNIQUE EFFECT IN MALE RATS. UNLEADED GASOLINE HAS BEEN IDENTIFIED AS A POSSIBLE CARCINOGEN BY IARC. BENZENE, A COMPONENT OF THIS PRODUCT, IS A KNOWN CANCER (LEUKEMIA) HAZARD. RESULTS OF TESTS IN HUMANS HAVE SHOWN THAT EXPOSURE TO BENZENE CAN CAUSE IRREVERSIBLE CHANGES IN THE GENETIC MATERIAL (DNA) OF A CELL. THE HUMAN HEALTH CONSEQUENCES OF THESE CHANGES IS NOT FULLY UNDERSTOOD. BENZENE HAS BEEN IDENTIFIED AS A CARCINOGEN BY IARC, NTP AND OSHA. THERE IS INSUFFICIENT EVIDENCE TO SHOW THAT GASOLINE POSES ANY HAZARD RELATED TO ITS LOW BENZENE CONTENT. PERSONS WITH PRE-EXISTING HEART DISORDERS MAY BE MORE SUSCEPTIBLE TO IRREGULAR HEARTBEATS (ARRHYTHMIAS) IF EXPOSED TO HIGH CONCENTRATIONS OF THIS MATERIAL (SEE SECTION II - NOTE TO PHYSICIANS). GASOLINE ENGINE EXHAUST HAS BEEN IDENTIFIED AS A POSSIBLE HUMAN CANCER HAZARD BY IARC. THIS CLASSIFICATION IS BASED ON THE FINDING THAT SOLVENT EXTRACTS OF GASOLINE EXHAUST SOOT CAUSED SKIN CANCER IN LABORATORY ANIMALS.

SECTION IV - SPECIAL PROTECTION INFORMATION

1 VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE TO MAINTAIN AIRBORNE CONCENTRATIONS BELOW THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I), ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED. WHERE EXPLOSIVE MIXTURES MAY BE PRESENT, ELECTRICAL SYSTEMS SAFE FOR SUCH LOCATIONS MUST BE USED.

1 RESPIRATORY PROTECTION:

THE USE OF RESPIRATORY PROTECTION IS ADVISED WHEN CONCENTRATIONS EXCEED THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I). DEPENDING ON THE AIRBORNE CONCENTRATION, USE A RESPIRATOR OR GAS MASK WITH APPROPRIATE CARTRIDGES AND CANNISTERS (NIOSH APPROVED, IF AVAILABLE) OR SUPPLIED AIR EQUIPMENT.

1 PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

1 EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

1 OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

1 REACTIVITY:

STABLE UNDER NORMAL CONDITIONS OF STORAGE AND HANDLING.

EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE.

UNION OIL CO.	
Product Name: UNOCAL HIGH PERFORMANCE 92	Page 5
Product Code No: 00901	Issue Date: 04/17/91 Status: FINAL
SECTION V - REACTIVITY DATA	
1	<u>CONDITIONS AFFECTING REACTIVITY:</u>
	AVOID ALL POSSIBLE SOURCES OF IGNITION (SEE SECTIONS VII AND VIII).
1	<u>INCOMPATIBLE MATERIALS:</u>
	CONTACT WITH STRONG OXIDIZING AGENTS SUCH AS CHLORINE, PERMANGANATES AND DICROMATES MAY CAUSE FIRE OR EXPLOSION.
1	<u>HAZARDOUS DECOMPOSITION PRODUCTS:</u>
	COMBUSTION MAY YIELD SIGNIFICANT AMOUNTS OF CARBON MONOXIDE AND SMALL AMOUNTS OF OXIDES OF SULFUR AND NITROGEN, BENZENE AND OTHER ORGANIC COMPOUNDS.
1	<u>HAZARDOUS POLYMERIZATION:</u>
	WILL NOT OCCUR
1	<u>POLYMERIZATION CONDITIONS TO AVOID:</u>
	NONE KNOWN
SECTION VI - SPILL AND LEAK PROCEDURES ***HIGHWAY OR RAILWAY SPILLS***	
	Call CHEMTREC (800) 424-9300 Cont. U.S. (Collect) (202) 483-7616 from Alaska & Hawaii
1	<u>PRECAUTIONS IN CASE OF RELEASE OR SPILL:</u>
	EXTREMELY FLAMMABLE. KEEP ALL SOURCES OF IGNITION AND HOT METAL SURFACES AWAY FROM SPILL/RELEASE. STAY UPWIND AND AWAY FROM SPILL/RELEASE. ISOLATE HAZARD AREA AND LIMIT ENTRY TO EMERGENCY CREW. STOP SPILL/RELEASE IF IT CAN BE DONE WITHOUT RISK. WEAR APPROPRIATE PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY PROTECTION AS CONDITIONS WARRANT (SEE SECTION IV). PREVENT SPILLED MATERIAL FROM ENTERING SEWERS, STORM DRAINS, OTHER UNAUTHORIZED TREATMENT DRAINAGE SYSTEMS AND NATURAL WATERWAYS. DIKE FAR AHEAD OF SPILL FOR LATER RECOVERY OR DISPOSAL. SPILLED MATERIAL MAY BE ABSORBED INTO AN APPROPRIATE ABSORBENT MATERIAL. NOTIFY FIRE AUTHORITIES AND APPROPRIATE FEDERAL, STATE AND LOCAL AGENCIES. IMMEDIATE CLEANUP OF ANY SPILL IS RECOMMENDED. IF SPILL OF ANY AMOUNT IS MADE INTO OR UPON U.S. NAVIGABLE WATERS, THE CONTIGUOUS ZONE, OR ADJOINING SHORELINES, NOTIFY THE NATIONAL RESPONSE CENTER (PHONE NUMBER 800-424-8802).
1	<u>WASTE DISPOSAL METHOD:</u>
	DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.
SECTION VII - STORAGE AND SPECIAL PRECAUTIONS	
1	<u>HANDLING AND STORAGE PRECAUTIONS:</u>
	KEEP CONTAINER(S) TIGHTLY CLOSED. USE AND STORE THIS MATERIAL IN COOL, DRY, WELL VENTILATED AREAS AWAY FROM HEAT, DIRECT SUNLIGHT, HOT METAL SURFACES AND ALL SOURCES OF IGNITION. POST AREA "NO SMOKING OR OPEN FLAME." BOND AND GROUND ALL EQUIPMENT WHEN TRANSFERRING FROM ONE VESSEL TO ANOTHER. STORE ONLY IN APPROVED CONTAINERS. KEEP AWAY FROM ANY INCOMPATIBLE MATERIALS (SEE SECTION V). PROTECT CONTAINER(S) AGAINST PHYSICAL DAMAGE. THE USE OF EXPLOSION-PROOF EQUIPMENT IS RECOMMENDED AND MAY BE REQUIRED (SEE APPROPRIATE FIRE CODES.) DO NOT ENTER CONFINED SPACES SUCH AS TANKS OR PITS WITHOUT FOLLOWING PROPER ENTRY PROCEDURES SUCH AS ASTM D-4276. OUTDOOR OR DETACHED STORAGE IS PREFERRED. INDOOR STORAGE SHOULD MEET OSHA STANDARDS AND APPROPRIATE FIRE CODES. THE USE OF RESPIRATORY PROTECTION IS ADVISED WHEN CONCENTRATIONS EXCEED ANY ESTABLISHED EXPOSURE LIMITS (SEE SECTIONS I AND IV). WASH THOROUGHLY AFTER HANDLING. DO NOT WEAR CONTAMINATED CLOTHING OR SHOES. USE GOOD PERSONAL HYGIENE PRACTICE. "EMPTY" CONTAINERS RETAIN RESIDUE (LIQUID AND/OR VAPOR) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE

UNION OIL CO.

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SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

AND CAUSE INJURY OR DEATH. "EMPTY" DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED AND PROMPTLY SHIPPED TO THE SUPPLIER OR A DRUM RECONDITIONER. ALL OTHER CONTAINERS SHOULD BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS. BEFORE WORKING ON OR IN TANKS WHICH CONTAIN OR HAVE CONTAINED THIS PRODUCT, REFER TO OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, ANSI Z49.1, AND OTHER GOVERNMENTAL AND INDUSTRIAL REFERENCES PERTAINING TO CLEANING, REPAIRING, WELDING, OR OTHER CONTEMPLATED OPERATIONS.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA	HEALTH HAZARD:	2	HAZARD RANKING	FLASH POINT
HAZARD	FLAMMABILITY:	3	0 = LEAST	
CLASS	REACTIVITY:	0	1 = SLIGHT	-45 F (TCC)
	OTHER:		2 = MODERATE	
			3 = HIGH	
			4 = EXTREME	

1 EXTINGUISHING MEDIA:

DRY CHEMICAL, CARBON DIOXIDE, HALON, FOAM OR WATER SPRAY IS RECOMMENDED. WATER MAY BE INEFFECTIVE.

1 UNUSUAL FIRE & EXPLOSION HAZARDS:

THIS MATERIAL IS EXTREMELY FLAMMABLE AND MAY BE IGNITED BY HEAT, SPARKS, FLAME OR OTHER SOURCES OF IGNITION (e.g. STATIC ELECTRICITY, PILOT LIGHTS, MECHANICAL/ELECTRICAL EQUIPMENT). VAPORS MAY TRAVEL CONSIDERABLE DISTANCES TO A SOURCE OF IGNITION WHERE THEY MAY IGNITE, FLASHBACK OR EXPLODE. VAPOR/AIR EXPLOSION HAZARD INDOORS/OUTDOORS OR IN SEWERS. VAPORS ARE HEAVIER THAN AIR AND MAY ACCUMULATE IN LOW AREAS. IF CONTAINER IS NOT PROPERLY COOLED, IT MAY EXPLODE IN THE HEAT OF A FIRE.

1 SPECIAL FIRE FIGHTING PROCEDURES:

WEAR APPROPRIATE PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY PROTECTION AS CONDITIONS WARRANT (SEE SECTION IV). STOP SPILL/RELEASE IF IT CAN BE DONE WITHOUT RISK. MOVE UNDAMAGED CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. WATER SPRAY MAY BE USEFUL IN MINIMIZING OR DISPERSING VAPORS AND COOLING EQUIPMENT EXPOSED TO HEAT AND FLAME. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

SECTION IX - PHYSICAL DATA

***UNLESS OTHERWISE NOTED, VALUES ARE AT 20 C/68 F AND 760 mm Hg/1 atm.

1	<u>APPROX BOILING POINT</u>	(AIR = 1)	(N-BUTYL ACETATE = 1)	
1	85-430F / 29-221C	<u>VAPOR DENSITY</u>	<u>EVAPORATION RATE</u>	<u>% VOLATILE</u>
		>1	<1	100

1 % SOLUBILITY IN WATER

NEGLIGIBLE

1 SPECIFIC GRAVITY

0.75

1 APPEARANCE

RED LIQUID

1 ODOR

GASOLINE

UNION OIL CO.

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SECTION X - DOCUMENTARY INFORMATION

ISSUE DATE: 04/17/91 PRODUCT CODE NO. 00901
PREV. DATE: 05/04/90 PREV. PROD. CODE NO. NONE
MSDS NO: NONE PREV. MSDS NO: NONE

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

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MATERIAL SAFETY DATA SHEET

1201 West 5th Street
Los Angeles, California 90017

Product Name: UNOCAL UNLEADED PLUS 87 M/H GRADE
Product Code No: 00406
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Responsible Party: UNOCAL REFINING & MARKETING DIVISION UNION OIL COMPANY OF CALIFORNIA 1201 WEST 5TH STREET LOS ANGELES, CALIFORNIA 90017 CONTACT FOR FURTHER INFORMATION: MSDS COORDINATOR 213-977-7589	Transportation Emergencies: CHEMTREC (800) 424-9300 Cont. U.S. (202) 483-7616 (Collect) from Alaska & Hawaii Health Emergencies: LOS ANGELES POISON CONTROL CENTER (24 hrs) (800) 356-3129
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PRODUCT IDENTIFICATION

1 PRODUCT NAME: UNOCAL UNLEADED PLUS 87 M/H GRADE
 1 GENERIC NAME: UNLEADED GASOLINE
 1 CHEMICAL FAMILY: PETROLEUM HYDROCARBON
 1 DOT PROPER
 1 SHIPPING NAME: GASOLINE
 1 ID NUMBER: UN1203
 1 DOT HAZARD
 1 CLASSIFICATION: FLAMMABLE LIQUID

PRECAUTIONARY WARNING

1 DANGER|
 EXTREMELY FLAMMABLE. VAPORS MAY EXPLODE. HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL. ASPIRATION HAZARD IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. POSSIBLE CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS. NO SMOKING OR OPEN FLAME. KEEP AWAY FROM HEAT, SPARKS, FLAMES OR OTHER SOURCES OF IGNITION (e.g. STATIC ELECTRICITY, PILOT LIGHTS OR MECHANICAL/ELECTRICAL EQUIPMENT. VAPORS MAY BE IGNITED BY SPARK OR FLAME SOURCE MANY FEET AWAY. DO NOT OVERFILL TANK. USE ONLY WITH ADEQUATE VENTILATION. KEEP CONTAINER CLOSED. DO NOT BREATHE VAPOR OR MISTS. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. DO NOT TASTE OR SWALLOW. WASH THOROUGHLY AFTER HANDLING. NEVER SIPHON BY MOUTH. FOR USE AS MOTOR FUEL ONLY. DO NOT USE FOR ANY OTHER PURPOSE. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, GRIND OR DRILL ON OR NEAR CONTAINER. "EMPTY" CONTAINER RETAINS RESIDUE (LIQUID AND/OR VAPOR) AND MAY EXPLODE IN HEAT OF A FIRE. KEEP OUT OF REACH OF CHILDREN. FAILURE TO USE CAUTION MAY CAUSE SERIOUS INJURY OR ILLNESS.

SECTION I - COMPONENTS PERCENT EXPOSURE LIMIT UNITS AGENCY TYPE

HAZARDOUS COMPONENTS

GASOLINE					
CAS #: 8006-61-9	300.000	ppm	ACGIH	TWA	
	500.000	ppm	ACGIH	STEL	
	300.000	ppm	OSHA	TWA	
	500.000	ppm	OSHA	STEL	
	300.000	ppm	CAL OSHA	TWA	

UNION OIL CO.

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SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
BENZENE CAS #: 71-43-2	1.000 - 5.000	10.000 25.000 1.000 5.000 50.000 25.000 10.000	ppm ppm ppm ppm ppm ppm ppm	ACGIH MSHA OSHA OSHA CAL OSHA CAL OSHA CAL OSHA	TWA CEIL-SKIN TWA STEL CEIL EXCUR TWA-SKIN
TOLUENE CAS #: 108-88-3	1.000 - 9.000	100.000 150.000 100.000 100.000 150.000 200.000 100.000 500.000	ppm ppm ppm ppm ppm ppm ppm ppm	ACGIH ACGIH MSHA OSHA OSHA CAL OSHA CAL OSHA CAL OSHA	TWA STEL TWA TWA STEL EXCUR TWA-SKIN CEIL-SKIN
XYLENES CAS #: 1330-20-7	1.000 - 14.000	100.000 150.000 100.000 100.000 150.000 200.000 100.000 300.000	ppm ppm ppm ppm ppm ppm ppm ppm	ACGIH ACGIH MSHA OSHA OSHA CAL OSHA CAL OSHA CAL OSHA	TWA STEL TWA TWA STEL EXCUR TWA-SKIN CEIL-SKIN
N-HEXANE CAS #: 110-54-3		50.000 500.000 50.000 50.000	ppm ppm ppm ppm	ACGIH MSHA OSHA CAL OSHA	TWA TWA TWA TWA
ETHYLBENZENE CAS #: 100-41-4	1.000 - 5.000	100.000 125.000 100.000 100.000 125.000 100.000	ppm ppm ppm ppm ppm ppm	ACGIH ACGIH MSHA OSHA OSHA CAL OSHA	TWA STEL TWA TWA STEL TWA
1,2,4-TRIMETHYLBENZENE CAS #: 95-63-6	1.000 - 5.000				NOT ESTABLISHED
1 OTHER COMPONENTS					
		--NONE--			
1 THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING 1 REQUIREMENTS OF SARA 313 AND 40 CFR 372:				CAS NUMBER	WEIGHT %
				71-43-2	1-5
				108-88-3	1-9
				1330-20-7	1-14
				100-41-4	1-5
				1634-04-4	0-10
				95-63-6	1-5

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SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY

Have physician call LOS ANGELES POISON
 CONTROL CENTER (24 hrs) (800) 356-3129

1 EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

1 SKIN CONTACT:

WIPE MATERIAL FROM SKIN AND REMOVE CONTAMINATED SHOES AND CLOTHING. CLEANSE AFFECTED AREA(S) THOROUGHLY BY WASHING WITH MILD SOAP AND WATER AND, IF NECESSARY, A WATERLESS SKIN CLEANSER. IF IRRITATION OR REDNESS DEVELOPS AND PERSISTS, SEEK MEDICAL ATTENTION.

1 INHALATION (BREATHING):

IF RESPIRATORY SYMPTOMS OR OTHER SYMPTOMS OF EXPOSURE DEVELOP, MOVE VICTIM AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF SYMPTOMS PERSIST, SEEK IMMEDIATE MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. IF BREATHING DIFFICULTIES DEVELOP, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

1 INGESTION (SWALLOWING):

ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. IF VICTIM IS DROWSY OR UNCONSCIOUS, PLACE ON THE LEFT SIDE WITH THE HEAD DOWN. IF POSSIBLE, DO NOT LEAVE VICTIM UNATTENDED. SEEK MEDICAL ATTENTION.

1 COMMENTS:

NOTE TO PHYSICIANS: EXPOSURE TO HIGH CONCENTRATIONS OF THIS MATERIAL (e.g. IN ENCLOSED SPACES OR WITH DELIBERATE ABUSE) MAY BE ASSOCIATED WITH CARDIAC ARRHYTHMIAS. EPINEPHRINE AND OTHER SYMPATHOMIMETIC DRUGS MAY INITIATE CARDIAC ARRHYTHMIAS IN PERSONS EXPOSED TO THIS MATERIAL. OTHER DRUGS WITH LESS ARRHYTHMOGENIC POTENTIAL SHOULD BE CONSIDERED. IF SYMPATHOMIMETIC DRUGS ARE ADMINISTERED, OBSERVE FOR THE DEVELOPMENT OF CARDIAC ARRHYTHMIAS.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

1 EYE CONTACT:

THIS MATERIAL MAY CAUSE MILD EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID OR EXPOSURE TO VAPORS OR MISTS MAY CAUSE STINGING, TEARING AND REDNESS.

1 SKIN CONTACT:

THIS MATERIAL MAY CAUSE MILD SKIN IRRITATION. PROLONGED OR REPEATED CONTACT MAY CAUSE REDNESS, BURNING, AND DRYING AND CRACKING OF THE SKIN. CONTACT MAY RESULT IN SKIN ABSORPTION BUT SYMPTOMS OF TOXICITY ARE NOT ANTICIPATED BY THIS ROUTE ALONE UNDER NORMAL CONDITIONS OF USE. PERSONS WITH PRE-EXISTING SKIN DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

1 INHALATION (BREATHING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, BREATHING HIGH CONCENTRATIONS OF VAPORS OR MISTS MAY CAUSE FLUSHING, BLURRED VISION, NAUSEA AND SIGNS OF NERVOUS SYSTEM DEPRESSION (e.g. HEADACHE, DROWSINESS, DIZZINESS, LOSS OF COORDINATION AND FATIGUE). EXPOSURE TO HIGH CONCENTRATIONS MAY CAUSE LOSS OF CONSCIOUSNESS, CONVULSIONS, RESPIRATORY COLLAPSE AND DEATH. RESPIRATORY SYMPTOMS ASSOCIATED WITH PRE-EXISTING LUNG DISORDERS (e.g. ASTHMA-LIKE CONDITIONS) MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.

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SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

1 INGESTION (SWALLOWING):

ASPIRATION HAZARD - THIS MATERIAL CAN ENTER LUNGS DURING SWALLOWING OR VOMITING AND CAUSE LUNG INFLAMMATION AND DAMAGE. INGESTION OF EXCESSIVE QUANTITIES OF THIS MATERIAL MAY CAUSE IRRITATION OF THE DIGESTIVE TRACT AND SIGNS OF NERVOUS SYSTEM DEPRESSION (e.g. HEADACHE, DROWSINESS, DIZZINESS, LOSS OF COORDINATION, AND FATIGUE).

1 COMMENTS:

GASOLINE IS A POSSIBLE CANCER HAZARD BASED ON TESTS IN LABORATORY ANIMALS. FOLLOW-UP STUDIES SUGGEST THAT THIS MAY BE A UNIQUE EFFECT IN MALE RATS. UNLEADED GASOLINE HAS BEEN IDENTIFIED AS A POSSIBLE CARCINOGEN BY IARC. BENZENE, A COMPONENT OF THIS PRODUCT, IS A KNOWN CANCER (LEUKEMIA) HAZARD. RESULTS OF TESTS IN HUMANS HAVE SHOWN THAT EXPOSURE TO BENZENE CAN CAUSE IRREVERSIBLE CHANGES IN THE GENETIC MATERIAL (DNA) OF A CELL. THE HUMAN HEALTH CONSEQUENCES OF THESE CHANGES IS NOT FULLY UNDERSTOOD. BENZENE HAS BEEN IDENTIFIED AS A CARCINOGEN BY IARC, NTP AND OSHA. THERE IS INSUFFICIENT EVIDENCE TO SHOW THAT GASOLINE POSES ANY HAZARD RELATED TO ITS LOW BENZENE CONTENT. PERSONS WITH PRE-EXISTING HEART DISORDERS MAY BE MORE SUSCEPTIBLE TO IRREGULAR HEARTBEATS (ARRHYTHMIAS) IF EXPOSED TO HIGH CONCENTRATIONS OF THIS MATERIAL (SEE SECTION II - NOTE TO PHYSICIANS). GASOLINE ENGINE EXHAUST HAS BEEN IDENTIFIED AS A POSSIBLE HUMAN CANCER HAZARD BY IARC. THIS CLASSIFICATION IS BASED ON THE FINDING THAT SOLVENT EXTRACTS OF GASOLINE EXHAUST SOOT CAUSED SKIN CANCER IN LABORATORY ANIMALS.

SECTION IV - SPECIAL PROTECTION INFORMATION

1 VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE TO MAINTAIN AIRBORNE CONCENTRATIONS BELOW THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I), ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED. WHERE EXPLOSIVE MIXTURES MAY BE PRESENT, ELECTRICAL SYSTEMS SAFE FOR SUCH LOCATIONS MUST BE USED.

1 RESPIRATORY PROTECTION:

THE USE OF RESPIRATORY PROTECTION IS ADVISED WHEN CONCENTRATIONS EXCEED THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I). DEPENDING ON THE AIRBORNE CONCENTRATION, USE A RESPIRATOR OR GAS MASK WITH APPROPRIATE CARTRIDGES AND CANNISTERS (NIOSH APPROVED, IF AVAILABLE) OR SUPPLIED AIR EQUIPMENT.

1 PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

1 EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

1 OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

1 REACTIVITY:

STABLE UNDER NORMAL CONDITIONS OF STORAGE AND HANDLING.
 EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE.

UNION OIL CO.

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SECTION V - REACTIVITY DATA

CONDITIONS AFFECTING REACTIVITY:

AVOID ALL POSSIBLE SOURCES OF IGNITION (SEE SECTIONS VII AND VIII).

INCOMPATIBLE MATERIALS:

CONTACT WITH STRONG OXIDIZING AGENTS SUCH AS CHLORINE, PERMANGANATES AND DICHROMATES MAY CAUSE FIRE OR EXPLOSION.

HAZARDOUS DECOMPOSITION PRODUCTS:

COMBUSTION MAY YIELD SIGNIFICANT AMOUNTS OF CARBON MONOXIDE AND SMALL AMOUNTS OF OXIDES OF SULFUR AND NITROGEN, BENZENE AND OTHER ORGANIC COMPOUNDS.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

POLYMERIZATION CONDITIONS TO AVOID:

NONE KNOWN

SECTION VI - SPILL AND LEAK PROCEDURES ***HIGHWAY OR RAILWAY SPILLS***
 Call CHEMTREC (800) 424-9300 Cont. U.S.
 (Collect) (202) 483-7616 from Alaska & Hawaii

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

EXTREMELY FLAMMABLE. KEEP ALL SOURCES OF IGNITION AND HOT METAL SURFACES AWAY FROM SPILL/RELEASE. STAY UPWIND AND AWAY FROM SPILL/RELEASE. ISOLATE HAZARD AREA AND LIMIT ENTRY TO EMERGENCY CREW. STOP SPILL/RELEASE IF IT CAN BE DONE WITHOUT RISK. WEAR APPROPRIATE PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY PROTECTION AS CONDITIONS WARRANT (SEE SECTION IV). PREVENT SPILLED MATERIAL FROM ENTERING SEWERS, STORM DRAINS, OTHER UNAUTHORIZED TREATMENT DRAINAGE SYSTEMS AND NATURAL WATERWAYS. DIKE FAR AHEAD OF SPILL FOR LATER RECOVERY OR DISPOSAL. SPILLED MATERIAL MAY BE ABSORBED INTO AN APPROPRIATE ABSORBENT MATERIAL. NOTIFY FIRE AUTHORITIES AND APPROPRIATE FEDERAL, STATE AND LOCAL AGENCIES. IMMEDIATE CLEANUP OF ANY SPILL IS RECOMMENDED. IF SPILL OF ANY AMOUNT IS MADE INTO OR UPON U.S. NAVIGABLE WATERS, THE CONTIGUOUS ZONE, OR ADJOINING SHORELINES, NOTIFY THE NATIONAL RESPONSE CENTER (PHONE NUMBER 800-424-8802).

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

KEEP CONTAINER(S) TIGHTLY CLOSED. USE AND STORE THIS MATERIAL IN COOL, DRY, WELL VENTILATED AREAS AWAY FROM HEAT, DIRECT SUNLIGHT, HOT METAL SURFACES AND ALL SOURCES OF IGNITION. POST AREA "NO SMOKING OR OPEN FLAME." BOND AND GROUND ALL EQUIPMENT WHEN TRANSFERRING FROM ONE VESSEL TO ANOTHER. STORE ONLY IN APPROVED CONTAINERS. KEEP AWAY FROM ANY INCOMPATIBLE MATERIALS (SEE SECTION V). PROTECT CONTAINER(S) AGAINST PHYSICAL DAMAGE. THE USE OF EXPLOSION-PROOF EQUIPMENT IS RECOMMENDED AND MAY BE REQUIRED (SEE APPROPRIATE FIRE CODES.) DO NOT ENTER CONFINED SPACES SUCH AS TANKS OR PITS WITHOUT FOLLOWING PROPER ENTRY PROCEDURES SUCH AS ASTM D-4276. OUTDOOR OR DETACHED STORAGE IS PREFERRED. INDOOR STORAGE SHOULD MEET OSHA STANDARDS AND APPROPRIATE FIRE CODES. THE USE OF RESPIRATORY PROTECTION IS ADVISED WHEN CONCENTRATIONS EXCEED ANY ESTABLISHED EXPOSURE LIMITS (SEE SECTIONS I AND IV). WASH THOROUGHLY AFTER HANDLING. DO NOT WEAR CONTAMINATED CLOTHING OR SHOES. USE GOOD PERSONAL HYGIENE PRACTICE. "EMPTY" CONTAINERS RETAIN RESIDUE (LIQUID AND/OR VAPOR) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE

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SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

AND CAUSE INJURY OR DEATH. "EMPTY" DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED AND PROMPTLY SHIPPED TO THE SUPPLIER OR A DRUM RECONDITIONER. ALL OTHER CONTAINERS SHOULD BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS. BEFORE WORKING ON OR IN TANKS WHICH CONTAIN OR HAVE CONTAINED THIS PRODUCT, REFER TO OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, ANSI Z49.1, AND OTHER GOVERNMENTAL AND INDUSTRIAL REFERENCES PERTAINING TO CLEANING, REPAIRING, WELDING, OR OTHER CONTEMPLATED OPERATIONS.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA	HEALTH HAZARD:	2	HAZARD RANKING	FLASH POINT
HAZARD	FLAMMABILITY:	3	0 = LEAST	
CLASS	REACTIVITY:	0	1 = SLIGHT	-45 F (TCC)
	OTHER:		2 = MODERATE	
			3 = HIGH	
			4 = EXTREME	

1 EXTINGUISHING MEDIA:

DRY CHEMICAL, CARBON DIOXIDE, HALON, FOAM OR WATER SPRAY IS RECOMMENDED. WATER MAY BE INEFFECTIVE.

1 UNUSUAL FIRE & EXPLOSION HAZARDS:

THIS MATERIAL IS EXTREMELY FLAMMABLE AND MAY BE IGNITED BY HEAT, SPARKS, FLAME OR OTHER SOURCES OF IGNITION (e.g. STATIC ELECTRICITY, PILOT LIGHTS, MECHANICAL/ELECTRICAL EQUIPMENT): VAPORS MAY TRAVEL CONSIDERABLE DISTANCES TO A SOURCE OF IGNITION WHERE THEY MAY IGNITE, FLASHBACK OR EXPLODE. VAPOR/AIR EXPLOSION HAZARD INDOORS/OUTDOORS OR IN SEWERS. VAPORS ARE HEAVIER THAN AIR AND MAY ACCUMULATE IN LOW AREAS. IF CONTAINER IS NOT PROPERLY COOLED, IT MAY EXPLODE IN THE HEAT OF A FIRE.

1 SPECIAL FIRE FIGHTING PROCEDURES:

WEAR APPROPRIATE PROTECTIVE EQUIPMENT INCLUDING RESPIRATORY PROTECTION AS CONDITIONS WARRANT (SEE SECTION IV). STOP SPILL/RELEASE IF IT CAN BE DONE WITHOUT RISK. MOVE UNDAMAGED CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. WATER SPRAY MAY BE USEFUL IN MINIMIZING OR DISPERSING VAPORS AND COOLING EQUIPMENT EXPOSED TO HEAT AND FLAME. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

SECTION IX - PHYSICAL DATA

***UNLESS OTHERWISE NOTED, VALUES ARE AT 20 C/68 F AND 760 mm Hg/1 atm.

1	<u>APPROX BOILING POINT</u>	(AIR = 1) <u>VAPOR DENSITY</u>	(N-BUTYL ACETATE = 1) <u>EVAPORATION RATE</u>	<u>% VOLATILE</u>
1	90-430 F	>1	<1	100

1 % SOLUBILITY IN WATER

NEGLECTIBLE

1 SPECIFIC GRAVITY

0.75

1 APPEARANCE

COLORLESS LIQUID

1 ODOR

GASOLINE

UNION OIL CO.

Product Name: UNOCAL UNLEADED PLUS 87 M/H GRADE
Product Code No: 00406

Page 7
Issue Date: 04/17/91
Status: FINAL

SECTION X - DOCUMENTARY INFORMATION

ISSUE DATE: 04/17/91 PRODUCT CODE NO. 00406
PREV. DATE: 05/04/90 PREV. PROD. CODE NO. NONE
MSDS NO: NONE PREV. MSDS NO: NONE

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Unocal Corporation
 1201 West 5th Street, P.O. Box 7600
 Los Angeles, California 90051

Product Name: UNOCAL DIESEL #2
 Product Code No: 01602

Page 1
 Issue Date: 12/18/89

MANUFACTURER

UNOCAL REFINING & MARKETING DIVISION
 UNION OIL COMPANY OF CALIFORNIA
 1201 WEST 5TH STREET
 LOS ANGELES, CALIFORNIA 90017

CONTACT FOR FURTHER INFORMATION:
 MSDS COORDINATOR 213-977-7589

Transportation Emergencies:

CHEMTREC
 (800) 424-9300 Cont. U.S.
 (202) 483-7616 (Collect)
 from Alaska & Hawaii
 Health Emergencies:
 Call LOS ANGELES POISON
 INFORMATION CENTER (24 hrs)
 1-(800)-356-3129

PRODUCT IDENTIFICATION

PRODUCT NAME: UNOCAL DIESEL #2
 SYNONYMS: UNION DIESEL #2
 GENERIC NAME: MID-DISTILLATE
 CHEMICAL FAMILY: PETROLEUM HYDROCARBON
 DOT PROPER SHIPPING NAME: FUEL OIL NO. 2
 ID NUMBER: NA1993
 DOT HAZARD CLASSIFICATION: COMBUSTIBLE LIQUID

SECTION I - COMPONENTS	PERCENT	EXPOSURE LIMIT	UNITS	AGENCY	TYPE
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HAZARDOUS COMPONENTS

DIESEL OIL NO. 2 CAS #: 68476-34-6	>98	400.000	ppm	OSHA	TWA
BIPHENYL CAS #: 92-52-4	0.0 - 1.0	0.200	ppm	ACGIH	TWA
		0.200	ppm	MSHA	TWA
		0.200	ppm	OSHA	TWA
		0.200	ppm	CAL OSHA	TWA
NAPHTHALENE CAS #: 91-20-3	0.0 - 1.0	10.000	ppm	ACGIH	TWA
		15.000	ppm	ACGIH	STEL
		10.000	ppm	MSHA	TWA
		10.000	ppm	OSHA	TWA
		15.000	ppm	OSHA	STEL
		10.000	ppm	CAL OSHA	TWA

OTHER COMPONENTS

--NONE--

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA 313 AND 40 CFR 372:

CAS NUMBER	WEIGHT %
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BIPHENYL	92-52-4	0-1
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SECTION I

NAPHTHALENE

91-20-3

0-1

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY

Have physician call LOS ANGELES POISON
INFORMATION CENTER (24 hrs) (800) 356-3129EYE CONTACT:

IF IRRITATION OR REDNESS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES WITH CLEAN WATER. IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION.

SKIN CONTACT:

WIPE MATERIAL FROM SKIN, REMOVE CONTAMINATED SHOES AND CLOTHING, AND FLUSH AFFECTED AREA(S) WITH LARGE AMOUNTS OF WATER. IF SKIN SURFACE IS DAMAGED, APPLY A CLEAN DRESSING AND SEEK MEDICAL ATTENTION. IF SKIN SURFACE IS NOT DAMAGED, CLEANSE AFFECTED AREA(S) THOROUGHLY BY WASHING WITH MILD SOAP AND WATER AND, IF NECESSARY, A WATERLESS SKIN CLEANSER. IF IRRITATION OR REDNESS DEVELOPS, SEEK MEDICAL ATTENTION.

INHALATION (BREATHING):

IF RESPIRATORY SYMPTOMS OR OTHER SYMPTOMS OF EXPOSURE DEVELOP, MOVE VICTIM AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF SYMPTOMS PERSIST, SEEK IMMEDIATE MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION. IF BREATHING DIFFICULTIES DEVELOP, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION (SWALLOWING):

ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. IF VICTIM IS DROWSY OR UNCONSCIOUS, PLACE ON THE LEFT SIDE WITH THE HEAD DOWN. IF POSSIBLE, DO NOT LEAVE VICTIM UNATTENDED. SEEK MEDICAL ATTENTION.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT:

THIS MATERIAL MAY CAUSE MILD EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID OR EXPOSURE TO VAPORS OR MISTS MAY CAUSE STINGING, TEARING AND REDNESS.

SKIN CONTACT:

THIS MATERIAL IS A SKIN IRRITANT. PROLONGED OR REPEATED CONTACT MAY CAUSE SEVERE IRRITATION INCLUDING REDNESS AND BURNING, DRYING AND CRACKING OF THE SKIN, AND SEVERE SKIN DAMAGE. NO HARMFUL EFFECTS ARE EXPECTED FROM SKIN ABSORPTION OF THIS MATERIAL. PERSONS WITH PRE-EXISTING SKIN DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

INHALATION (BREATHING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, BREATHING HIGH CONCENTRATIONS OF VAPORS OR MISTS MAY CAUSE IRRITATION OF THE NOSE AND THROAT AND SIGNS OF NERVOUS SYSTEM DEPRESSION (E.G., HEADACHE, DROWSINESS, DIZZINESS, LOSS OF COORDINATION, AND FATIGUE).

INGESTION (SWALLOWING):

WHILE THIS MATERIAL HAS A LOW DEGREE OF TOXICITY, INGESTION OF EXCESSIVE QUANTITIES MAY CAUSE IRRITATION OF THE DIGESTIVE TRACT AND SIGNS OF NERVOUS SYSTEM DEPRESSION (E.G., HEADACHE, DROWSINESS, DIZZINESS, LOSS OF COORDINATION, AND FATIGUE). ASPIRATION HAZARD - THIS MATERIAL CAN ENTER LUNGS DURING SWALLOWING OR VOMITING AND CAUSE LUNG INFLAMMATION AND DAMAGE.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

COMMENTS:

DIESEL EXHAUST IS A PROBABLE HUMAN CANCER HAZARD, BUT IT HAS NOT BEEN IDENTIFIED AS A CARCINOGEN BY IARC, NTP OR OSHA.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE TO MAINTAIN AIRBORNE CONCENTRATIONS BELOW THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I), ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED. WHERE EXPLOSIVE MIXTURES MAY BE PRESENT, ELECTRICAL SYSTEMS SAFE FOR SUCH LOCATIONS MUST BE USED.

RESPIRATORY PROTECTION:

THE USE OF RESPIRATORY PROTECTION IS ADVISED WHEN CONCENTRATIONS EXCEED THE ESTABLISHED EXPOSURE LIMITS (SEE SECTION I). DEPENDING ON THE AIRBORNE CONCENTRATION, USE A RESPIRATOR OR GAS MASK WITH APPROPRIATE CARTRIDGES AND CANNISTERS (NIOSH APPROVED, IF AVAILABLE) OR SUPPLIED AIR EQUIPMENT.

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN THE WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

REACTIVITY:

STABLE UNDER NORMAL CONDITIONS OF STORAGE AND HANDLING.

CONDITIONS AFFECTING REACTIVITY:

AVOID CONTACT WITH ANY SOURCE OF HEAT OR FLAME.

INCOMPATIBLE MATERIALS:

AVOID CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

COMBUSTION MAY YIELD MAJOR AMOUNTS OF OXIDES OF CARBON, AND MINOR AMOUNTS OF OXIDES OF SULFUR AND NITROGEN.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

POLYMERIZATION CONDITIONS TO AVOID:

NONE KNOWN

SECTION VI - SPILL AND LEAK PROCEDURES ***HIGHWAY OR RAILWAY SPILLS***
Call CHEMTREC (800) 424-9300 Cont. U.S.
(Collect) (202) 483-7616 from Alaska & Hawaii

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

ISOLATE HAZARD AREA AND RESTRICT ENTRY. STOP AND/OR CONTAIN DISCHARGE IF IT CAN BE DONE SAFELY. COMBUSTIBLE. KEEP ALL SOURCES OF IGNITION AWAY FROM SPILL/RELEASE. ISOLATE HAZARD AREA AND LIMIT ENTRY TO AUTHORIZED PERSONNEL. KEEP OUT OF DRAINS, SEWERS OR WATERWAYS. TAKE UP SPILLED MATERIAL WITH SAND OR OTHER INERT NON-COMBUSTIBLE MATERIAL. THEN FLUSH AREA WITH WATER. NOTIFY FIRE AUTHORITIES AND APPROPRIATE FEDERAL, STATE AND LOCAL AGENCIES. IF SPILL OF ANY AMOUNT IS MADE INTO OR UPON U.S. NAVIGABLE WATERS, THE CONTIGUOUS ZONE, OR ADJOINING SHORELINES, NOTIFY THE NATIONAL RESPONSE CENTER (PHONE NUMBER 800-424-8802).

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

STORE IN A COOL, DRY LOCATION. KEEP CONTAINER(S) TIGHTLY CLOSED. KEEP AWAY FROM ANY INCOMPATIBLE MATERIALS (SEE SECTION V). USE AND STORE THIS PRODUCT WITH ADEQUATE VENTILATION. POST AREA "NO SMOKING OR OPEN FLAME." BOND AND GROUND ALL EQUIPMENT WHEN TRANSFERRING FROM ONE VESSEL TO ANOTHER. KEEP WORK AREA FREE OF HOT METAL SURFACES AND OTHER SOURCES OF IGNITION. AVOID INHALATION OF VAPORS/MISTS/FUMES AND PERSONAL CONTACT WITH THE PRODUCT. WASH THOROUGHLY AFTER HANDLING. LAUNDRER SATURATED CLOTHING BEFORE WEARING.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA HAZARD CLASS	HEALTH HAZARD: 0 FLAMMABILITY: 2 REACTIVITY: 0 OTHER:	HAZARD RANKING 0 - LEAST 1 - SLIGHT 2 - MODERATE 3 - HIGH 4 - EXTREME	FLASH POINT (PMCC) 140-190 F 60-87 C
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EXTINGUISHING MEDIA:

EXTINGUISH WITH DRY CHEMICAL, CO2, WATER SPRAY, FOAM, SAND OR EARTH.

UNUSUAL FIRE & EXPLOSION HAZARDS:

THIS MATERIAL IS COMBUSTIBLE AND MAY BE IGNITED BY HEAT OR FLAME.

SPECIAL FIRE FIGHTING PROCEDURES:

WATER SPRAY MAY BE USEFUL IN MINIMIZING VAPORS AND COOLING CONTAINERS EXPOSED TO HEAT AND FLAME. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES. MOVE UNDAMAGED CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK.

SECTION IX - PHYSICAL DATA

***UNLESS OTHERWISE NOTED, VALUES ARE AT 20 C/68 F AND 760 mm Hg/1 atm.

<u>APPROX BOILING POINT</u>	<u>(AIR - 1) VAPOR DENSITY</u>	<u>(N-BUTYL ACETATE - 1) EVAPORATION RATE</u>	<u>% VOLATILE</u>
490 - 700 F / 232 - 371 C	>1	<1	98

Product Name: UNOCAL DIES^{EL} #2
 Product Code No: 01602

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SECTION IX - PHYSICAL DATA

§ SOLUBILITY IN WATER

NEGLIGIBLE

SPECIFIC GRAVITY

0.85

APPROX. BULK DENSITY (lb/gal)

7.0

APPEARANCE

CLEAR TO YELLOW LIQUID

ODOR

DIESEL

SECTION X - PRECAUTIONARY WARNING

WARNING! COMBUSTIBLE. MAY CAUSE SEVERE SKIN IRRITATION AFTER PROLONGED OR REPEATED CONTACT. BREATHING DIESEL EXHAUST MAY CAUSE LUNG CANCER. ASPIRATION HAZARD IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. BREATHING DIESEL EXHAUST MAY CAUSE LUNG CANCER. KEEP AWAY FROM HEAT AND FLAME. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. AVOID BREATHING EXHAUST FUMES. DO NOT TASTE OR SWALLOW. WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. AVOID BREATHING EXHAUST FUMES. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, GRIND OR DRILL ON OR NEAR THIS CONTAINER. "EMPTY" CONTAINER RETAINS RESIDUE (LIQUID AND/OR VAPOR) AND MAY EXPLODE IN HEAT OF A FIRE. FIRST AID: DANGER - ASPIRATION HAZARD. IF SWALLOWED DO NOT INDUCE VOMITING. CALL A PHYSICIAN. IN CASE OF EYE CONTACT FLUSH EYES WITH PLENTY OF WATER. IN CASE OF SKIN CONTACT, REMOVE CONTAMINATED CLOTHING AND IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER. CALL A PHYSICIAN. WASH CLOTHING BEFORE REUSE.

SECTION XI - DOCUMENTARY INFORMATION

ISSUE DATE: 12/18/89 PRODUCT CODE NO. 01602
 PREV. DATE: 05/01/89 PREV. PROD. CODE NO. N/A
 MSDS NO: N/A PREV. MSDS NO: N/A

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APPENDIX B

KEI-P91-1004.QR3
April 2, 1993

TABLE 3
SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample #</u>	<u>TDS</u>
11/30/92	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT
	MW2	6,400
	MW3	6,500
	MW4	3,800
	MW5	*
	MW6	9,800

* Not analyzed due to insufficient sample volume.

Results in parts per million (ppm), unless otherwise indicated.

TABLE 2

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>
8/15/94	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	2,800♦♦	35,000	2,400	850	1,700	15,000
	MW3	110♦♦	130	1.1	0.54	ND	0.97
	MW4	72♦♦	59**	ND	0.60	ND	ND
	MW5	860♦♦	1,600	110	ND	340	72
	MW6	790♦♦	1,300	130	6.7	54	57
5/19/94	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	3,000♦♦	42,000	2,500	1,300	2,300	13,000
	MW3	480♦♦	1,800	83	ND	6.2	9.1
	MW4	90♦♦	140**	ND	ND	ND	ND
	MW5	600♦♦	260	44	ND	32	4.1
	MW6	1,400♦♦	3,600	300	1.7	210	41
2/07/94	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW3	620♦♦	2,700	110	ND	17	ND
	MW4	ND	56**	ND	ND	ND	ND
	MW5	830♦♦	2,000	87	ND	370	110
	MW6	970♦♦	4,900	650	ND	250	35
11/03/93	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	2,600♦♦	72,000	3,700	16,000	3,700	20,000
	MW3	160	640**	ND	ND	ND	ND
	MW4	68	130**	ND	ND	ND	ND
	MW5	2,100♦♦	13,000	350	ND	3,500	530
	MW6	390♦♦	1,400	320	ND	200	7.7
8/04/93	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	1,800♦♦	45,000	2,100	6,600	1,400	12,000
	MW3	100	210**	ND	ND	ND	ND
	MW4	81	250**	ND	3.5	ND	4.1
	MW5▲	970♦♦	1,500	130	1.0	460	11
	MW6	1,100♦♦	3,400	390	ND	440	190

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Well #</u>	<u>TPH as Diesel</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>
5/04/93	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	7,100♦	63,000	3,200	17,000	470	17,000
	MW3	250♦♦	1,800*	95	ND	ND	ND
	MW4	ND	110*	0.95	ND	ND	ND
	MW5▲	4,600♦	7,400	41	ND	1,000	35
	MW6	1,800♦	4,900	360	18	450	430
2/04/93	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	6,100♦	18,000	1,600	3,000	ND	6,900
	MW3	550♦♦	3,300	320	ND	96	6.1
	MW4	ND	ND	ND	ND	ND	ND
	MW5▲	5,500♦♦	5,700	38	ND	620	170
	MW6	890♦♦	3,600	340	ND	290	550
11/30/92	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	5,700♦	29,000	2,000	3,400	1,200	6,900
	MW3	94	790**	ND	ND	ND	ND
	MW4	61	420**	ND	ND	ND	ND
	MW5▲	470♦♦	930	70	290	0.79	14
	MW6	1,400♦	9,200	550	ND	740	1,600
8/31/92	MW1	8,900♦	64,000	13,000	12,000	2,500	22,000
	MW2	1,600♦	9,000	1,800	640	140	2,000
	MW3	92♦♦	210**	1.0	ND	ND	ND
	MW4	90♦♦	240**	ND	ND	ND	0.54
	MW5	690♦	78	0.89	ND	ND	13
	MW6	750♦♦	ND	ND	ND	ND	ND
5/20/92	MW1	NOT SAMPLED DUE TO THE PRESENCE OF FREE PRODUCT					
	MW2	4,300♦	24,000	2,200	7,600	630	11,000
	MW3	WELL WAS INACCESSIBLE					
2/18/92	MW1	13,000	150,000	17,000	26,000	5,200	26,000
	MW2	4,300	29,000	1,000	5,300	260	7,900
	MW3	ND	230	4.8	22	1.8	33

TABLE 2 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

- ◆ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be diesel.
- ◆◆ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a diesel and non-diesel mixture.
- * Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.
- ** Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.
- ▲ Total Oil & Grease (TOG) was non-detectable.

ND = Non-detectable.

Results are in micrograms per liter ($\mu\text{g/L}$), unless otherwise indicated.

Note: Laboratory analyses data prior to February 7, 1994, were provided by Kaprealian Engineering, Inc.