1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name**: Naphtha, Sweet or Sour

**Supplier**: J.P. Morgan Ventures Energy Corporation  
383 Madison Avenue, 10th floor  
New York, NY 10017

**Synonyms**: Full Range Naphtha, Light Naphtha, Heavy Naphtha, Straight Run Naphtha, Aromatic Solvent Naphtha, Aliphatic Solvent Naphtha

**Chemical Family**: Petroleum Hydrocarbon

**Intended Use**: Refinery or Chemical Plant Feedstock

**Emergency Numbers**
- Chemtrec: 800-424-9300
- J.P. Morgan Technical Information: 212-834-5788
- California Poison Action Line: 800-222-1222

2. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Components Name/CAS No.</th>
<th>Concentration (%)</th>
<th>ACGIH Exposure Limits</th>
<th>OSHA Exposure Limits</th>
<th>NIOSH Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Run Full Range Naphtha 64741-42-0</td>
<td>0 - 100</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td></td>
</tr>
<tr>
<td>Straight Run Heavy Naphtha 64741-41-9</td>
<td>0 - 100</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td></td>
</tr>
<tr>
<td>Heavy Aliphatic Solvent Naphtha 64742-47-8</td>
<td>0 - 100</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td></td>
</tr>
<tr>
<td>Light Aromatic Solvent Naphtha 64742-95-6</td>
<td>0 - 100</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td>300 ppm TWA 500 ppm STEL</td>
<td></td>
</tr>
</tbody>
</table>

Exposure Limits Above Are Applicable to Gasoline

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>NIOSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene 71-43-2</td>
<td>0.1 - 3</td>
<td>0.5 ppm TWA 2.5 ppm STEL Skin</td>
<td>1 ppm TWA 5 ppm STEL Skin</td>
<td>0.5 ppm TWA 1 ppm STEL Skin 500 ppm IDLH</td>
</tr>
<tr>
<td>Cyclohexane 110-82-7</td>
<td>&lt; 1 - 3</td>
<td>100 ppm TWA</td>
<td>300 ppm TWA</td>
<td>300 ppm TWA 1300 ppm IDLH</td>
</tr>
<tr>
<td>Ethyl Benzene 100-41-4</td>
<td>&lt; 1 - 2</td>
<td>100 ppm TWA 125 ppm STEL</td>
<td>100 ppm TWA 125 ppm STEL</td>
<td>100 ppm TWA 125 ppm STEL 800 ppm IDLH</td>
</tr>
<tr>
<td>n-Hexane 110-54-3</td>
<td>1 - 7</td>
<td>50 ppm TWA Skin</td>
<td>500 ppm TWA</td>
<td>50 ppm TWA 1100 ppm IDLH</td>
</tr>
<tr>
<td>Hexane (all isomers) Mixture</td>
<td>2 - 8</td>
<td>500 ppm TWA 1000 ppm STEL</td>
<td>100 ppm TWA 510 ppm IDLH Ceiling</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Sulfide 7783-06-4</td>
<td>&lt; 0.1 - 3</td>
<td>10 ppm TWA 15 ppm STEL</td>
<td>20 ppm Ceiling 50 ppm Peak</td>
<td>10 ppm Ceiling 100 ppm IDLH</td>
</tr>
</tbody>
</table>
3. HAZARDS IDENTIFICATION

Emergency Overview
This product is a clear to amber liquid with a strong hydrocarbon odor, it may also have a sulfurous or rotten egg odor. Hydrogen sulfide, an extremely flammable and very toxic gas is expected to be present. This product is a volatile and extremely flammable liquid that may cause flash fires. Keep away from heat, sparks and flames and other sources of ignition. This product contains benzene, which may cause cancer or be toxic to blood forming organs. It contains material that has caused cancer based on animal data. Never siphon this product by mouth. If swallowed, this product may be aspirated into the lungs and cause lung damage or death.

Potential Acute Health Effects

**Inhalation**
Breathing high concentrations may be harmful. Mist or vapor can irritate the throat and lungs. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness or unconsciousness. This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (light sensitivity) and pulmonary edema (fluid accumulation in lungs). Severe exposures can result in nausea, vomiting, muscle weakness or convulsions, respiratory failure and death. Hydrogen sulfide and other hazardous vapors may evolve and collect in the headspace of storage tanks or other enclosed vessels. Hydrogen sulfide and other hazardous vapors may evolve and collect in the headspace of storage tanks or other enclosed vessels.
Eye Contact
This product can cause eye irritation from short-term contact with liquid, mists or vapors. Symptoms include stinging, watering, redness and swelling. Effects may be more serious with repeated or prolonged contact. Hydrogen sulfide vapors may cause moderate to severe eye irritation and photophobia (light sensitivity).

Skin Contact
This product is a skin irritant. Contact may cause redness, itching, burning and skin damage.

Ingestion
Ingestion may result in nausea, vomiting, diarrhea and restlessness. Aspiration (inadvertent suction) of liquid into the lungs must be avoided as even small quantities in the lungs can produce chemical pneumonitis, pulmonary edema or hemorrhage and even death.

Potential Chronic Health Effects

<table>
<thead>
<tr>
<th>Signs and Symptoms</th>
<th>Chronic effects of overexposure are similar to acute effects including central nervous system (CNS) effects and CNS depression. Effects of overexposure may also include irritation of the skin, digestive tract and respiratory tract, nausea, vomiting and cardiac system (heart).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogenic Potential</td>
<td>This material may contain benzene, ethyl benzene and naphthalene at concentrations above 0.1%. Benzene is considered to be a known human carcinogens by OSHA, IARC and NTP. IARC has identified ethyl benzene and naphthalene as possibly carcinogenic to humans (Group 2B) based on laboratory animal studies.</td>
</tr>
<tr>
<td>Target Organs</td>
<td>May cause damage to blood, kidneys, lungs, the reproductive system, liver, mucous membranes, heart, peripheral nervous system, cardiovascular system, upper respiratory tract, skin, auditory system, bone marrow, CNS, and eye lens or cornea.</td>
</tr>
<tr>
<td>Conditions Aggravated by Overexposure</td>
<td>Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include the skin, respiratory system, liver, kidneys, CNS, cardiovascular system and blood-forming system.</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Inhalation
Move the exposed person to fresh air. If not breathing, clear airways and give artificial respiration. If breathing is difficult, humidified oxygen should be administered by qualified personnel. Seek medical attention if breathing difficulties continue.

Eye
Flush eyes with water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye. Remove contact lenses, if worn, after initial flushing. Do not use eye ointment. Seek medical attention.
Remove contaminated shoes and clothing, and flush affected areas with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, clean affected area thoroughly with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Launder or discard contaminated clothing.

Aspiration hazard. Do not induce vomiting or give anything by mouth because the material can enter the lungs and cause severe lung damage. If spontaneous vomiting is about to occur, place victim’s head below knees. If victim is drowsy or unconscious, place on the left side with head down. Do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

This material may contain or liberate hydrogen sulfide. In high doses, hydrogen sulfide may produce pulmonary edema and respiratory depression or paralysis. The first priority in treatment should be providing adequate ventilation and administering 100% oxygen. If unresponsive to supportive care, nitrites (amyl nitrite by inhalation or sodium nitrite by IV) may be an effective antidote, if delivered within the first few minutes of exposure.

This material sensitizes the heart to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs should not be used because they may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbons.

Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis. Inhalation overexposure can produce toxic effects, monitor for respiratory distress. If cough or breathing difficulties develop, evaluate for upper respiratory tract inflammation, bronchitis and pneumonitis. Skin contact may aggravate an existing dermatitis. High pressure injection injuries may cause necrosis of underlying tissue regardless of superficial appearance.

**5. FIRE FIGHTING MEASURES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flammability Classification</strong></td>
<td>OSHA Classification (29 CFR 1910.1200): Flammable Liquid</td>
</tr>
<tr>
<td></td>
<td>NFPA Class-1B Flammable Liquid</td>
</tr>
<tr>
<td></td>
<td>NFPA Ratings: Health: 1, Flammability: 3, Reactivity: 0</td>
</tr>
<tr>
<td><strong>Flash Point</strong></td>
<td>38°C, &lt; 100°F (ASTM D-56)</td>
</tr>
<tr>
<td><strong>Flammable Limits</strong></td>
<td>Lower Limit: 0.7%</td>
</tr>
<tr>
<td></td>
<td>Upper Limit: 7.0%</td>
</tr>
<tr>
<td><strong>Autoignition Temperature</strong></td>
<td>261°C, 502°F</td>
</tr>
<tr>
<td><strong>Combustion Products</strong></td>
<td>Highly dependent on combustion conditions. Fume, smoke, carbon monoxide, carbon dioxide, sulfur and nitrogen oxides, aldehydes and unburned hydrocarbons.</td>
</tr>
</tbody>
</table>
**Fire and Explosion Hazards**

This material is extremely flammable and can be ignited by heat, sparks, flames or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment and electronic devices such as cell phones, computers, calculators and pagers which have not been certified as intrinsically safe). Vapors are heavier than air and can accumulate in low areas. May create vapor/air explosion hazard indoors, in confined spaces, outdoors or in sewers. Vapors may travel considerable distances to a remote source of ignition where they can ignite, flash back or explode. Product can accumulate a static charge that may cause a fire or explosion. A product container, if not properly cooled, can rupture in the heat of a fire.

**Extinguishing Media**

Dry chemical, carbon dioxide or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

**Fire Fighting**

Use water spray to cool fire-exposed containers and to protect personnel. Isolate immediate hazard area and keep unauthorized personnel out. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water. Avoid spreading burning liquid with water used for cooling.

For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by regulations, a self-contained breathing apparatus should be worn. Wear other appropriate protective equipment as conditions warrant.

### 6. ACCIDENTAL RELEASE MEASURES

**Protective Measures**

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment as conditions warrant per Exposure Controls/Personal Protection guidelines.

**Spill Management**

Stop the leak if it can be done without risk. Prevent spilled material from entering waterways, sewers, basements or confined areas. Contain release to prevent further contamination of soils, surface water or groundwater. Clean up spill as soon as possible using appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Dispose of contaminated materials in a manner consistent with applicable regulations.
7. HANDLING AND STORAGE

Handling
Use non-sparking tools and explosion-proof equipment. Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. Explosion-proof electrical equipment is recommended and may be required by fire codes. Warning! Use of this material in spaces without adequate ventilation may result in the generation of hazardous levels of combustion products and/or inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

Storage
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 warnings: ‘No Smoking or Open Flame’. Keep away from incompatible material. Outdoor or detached storage of portable containers is preferred. Indoor storage should meet OSHA standards and appropriate fire codes. In a tank, barge or other closed container, the vapor space above materials containing hydrogen sulfide may result in concentrations immediately dangerous to life or health.

Special Precautions
To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Do not use electronic devices (such as cellular phones, computers, calculators, pagers, etc.) in or around any fueling operation or storage area unless the devices are certified as intrinsically safe. Electrical equipment and fittings should comply with local fire codes.

Portable Containers
Portable containers should never be filled while they are in or on a motor vehicle or marine craft. Static electricity may ignite vapors when filling non-grounded containers or vehicles on trailers. To avoid static buildup, do not use a nozzle lock open device. Use only approved containers. Keep containers tightly closed. Place the container on the ground before filling. Keep the nozzle in contact with the container during filling.

Empty Container Warning
Empty containers retain liquid and vapor residues and can be dangerous. Do NOT pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat, flame, sparks, static electricity or other sources of ignition; they may explode and cause injury or death. Do not attempt to refill or clean containers since residue is difficult to remove. Empty drums should be completely drained, properly closed and returned to the supplier or a qualified drum reconditioner. All containers should be disposed of in an environmentally safe manner in accordance with government regulations.
8. EXPOSURE CONTROL / PERSONAL PROTECTION

General Considerations
Consider the potential hazards of this material, applicable exposure limits, job activities and other substances in the work place when designing engineering controls and selecting personal protective equipment.

Engineering Controls
Use process enclosures, local exhaust ventilation or other engineering controls to maintain airborne levels below the recommended exposure limits. An emergency eye wash station and safety shower should be located near the work station.

Personal Protective Equipment
If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, personal protective equipment (PPE) is recommended. A hazard assessment of the work should be conducted by a qualified professional to determine what PPE is required.

Respiratory Protection
When airborne concentrations are expected to exceed the established exposure limits given in Section 2, use a NIOSH approved organic vapor respirator. Use a full-face positive-pressure supplied air respirator in circumstances where air-purifying respirators may not provide adequate protection or where there may be the potential for airborne exposure above the exposure limits. If exposure concentration is unknown or IDLH conditions exist, use a NIOSH approved self contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode.

Eye Protection
Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Chemical goggles should be worn during transfer operations or when there is a likelihood of misting, splashing or spraying of this material.

Skin and Body Protection
Avoid skin contact. Wear long-sleeved fire-retardant garments while working with flammable and combustible liquids. Additional chemical-resistant protective gear may be required if splashing or spraying conditions exist. This may include an apron, arm covers, impervious gloves, boots and additional facial protection.

Hand Protection
Avoid skin contact. Use impervious gloves (e.g., PVC, neoprene, nitrile rubber). Wash hands with plenty of mild soap and water before eating, drinking, smoking, using toilet facilities or leaving work.
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Clear to amber liquid</th>
<th>Physical Form</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Strong hydrocarbon,</td>
<td>Odor Threshold</td>
<td>Not established</td>
</tr>
<tr>
<td></td>
<td>sulfurous odor possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>Neutral</td>
<td>Vapor Pressure</td>
<td>1 - 8 psi (Reid)</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>&gt;3 (air = 1)</td>
<td>Boiling Point/Range</td>
<td>149-446 °F/65-230 °C</td>
</tr>
<tr>
<td>Percent Volatile</td>
<td>&gt;20%</td>
<td>Partition Coefficient</td>
<td>Not established</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.72 - 0.76 @ 60 °F</td>
<td>Density</td>
<td>6.0 - 6.3 lb/gal @ 60 °F</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not determined</td>
<td>Evaporation Rate</td>
<td>Not established</td>
</tr>
<tr>
<td>Flash Point</td>
<td>&lt;100 °F/&lt;38 °C</td>
<td>Test Method</td>
<td>ASTM D-56</td>
</tr>
<tr>
<td>Explosive Limits</td>
<td>0.7% LEL, 7.0% UEL</td>
<td>Autoignition Temperature</td>
<td>502 F/261 C</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Slightly soluble in water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

**Stability**

Stable under normal anticipated storage and handling temperatures and pressures. Extremely flammable liquid and vapor. Vapor can cause flash fire.

**Conditions to Avoid**

Avoid all possible sources of ignition.

**Incompatibility (Materials to Avoid)**

Avoid contact with strong oxidizing agents such as strong acids, alkalies, chlorine and other halogens, dichromates or permanganates, which can cause fire or explosion.

**Hazardous Decompositions and Productions**

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products (e.g., oxides of carbon, sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

**Hazardous Polymerization**

Will not occur
11. TOXICOLOGICAL INFORMATION

**Heavy Straight Run Naphtha 64741-41-9**

**Acute Data:**
- Dermal LD$_{50}$ > 2 g/kg (Rabbit)
- LC$_{50}$ > 5.14 mg/l/4 hr
- Oral LD$_{50}$ > 5 g/kg (Rat)

**Carcinogenicity:** Application of heavy straight run naphtha to mouse skin for two years resulted in an increased number of skin tumors. This material has not been identified as a carcinogen by NTP, IARC or OSHA. Lifetime skin painting studies in mice with similar naphthas have shown weak or no carcinogenic activity following prolonged and repeated exposure. Similar naphthas/distillates, when tested at nonirritating dose levels, did not show any significant carcinogenic activity indicating that this tumorigenic response is likely related to chronic irritation and not to dose. The mutagenic potential of naphthas has been reported to be largely negative in a variety of mutagenicity tests. The exact relationship between these results and human health is not known. No deaths or treatment related signs of toxicity were observed in rats exposed to light alkylate naphtha (paraffinic hydrocarbons) at concentrations of 668 ppm, 2220 ppm and 6646 ppm for 6 hours/day, 5 days/week for 13 weeks. Increased liver weights and kidney toxicity (male rats) were observed in high dose animals.

**Developmental:** Exposure of pregnant rats to light alkylate naphtha at concentrations of 137 ppm, 3425 ppm and 6850 ppm did not adversely affect reproduction or cause maternal or fetal toxicity.

**Benzene 71-43-2**

**Acute Data:**
- Dermal LD$_{50}$ > 9400 mg/kg (Rabbit), (Guinea Pig)
- LC$_{50}$ = 9980 ppm (Mouse); 10000 ppm/7hr (Rat)
- Oral LD$_{50}$ = 4700 mg/kg (Mouse); 930 mg/kg (Rat); 5700 mg/kg (Mammal)

**Carcinogenicity:** Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by NTP, IARC and OSHA.

**Target Organs:** Prolonged or repeated exposures to benzene vapors has been linked to bone marrow toxicity which can result in blood disorders such as leukopenia, thrombocytopenia, and aplastic anemia. All of these diseases can be fatal.

**Developmental:** Exposure to benzene during pregnancy demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased body eight and increased skeletal variations in rodents. Alterations in hematopoeisis have been observed in the fetuses and offspring of pregnant mice.

**Mutagenicity:** Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.
Cyclohexane 110-82-7

Acute Toxicity:
- Dermal LD50 => 2 g/kg (Rabbit)
- LC50 > 4,044 ppm (4-hr, Rat) Oral
- LD50 > 2 g/kg (Rat)

Target Organs: Cyclohexane can cause eye, skin and mucous membrane irritation, CNS depressant and narcosis at elevated concentrations. In experimental animals exposed to lethal concentrations by inhalation or oral route, generalized vascular damage and degenerative changes in the heart, lungs, liver, kidneys and brain were identified.

Developmental: Cyclohexane has been the focus of substantial testing in laboratory animals. Cyclohexane was not found to be genotoxic in several tests including unscheduled DNA synthesis, bacterial and mammalian cell mutation assays, and in vivo chromosomal aberration. An increase in chromosomal aberrations in bone marrow cells of rats exposed to cyclohexane was reported in the 1980’s. However, a careful reevaluation of slides from this study by the laboratory which conducted the study indicates these findings were in error, and that no significant chromosomal effects were observed in animals exposed to cyclohexane. Findings indicate long-term exposure to cyclohexane does not promote dermal tumorigenesis.

Ethyl Benzene 100-41-4

Acute Toxicity:
- Dermal LD50 = 17800 mg/kg (Rabbit)
- LC50 = 4000 ppm/4 hr; 13367 ppm (Rat)
- Oral LD50 = 3500 mg/kg (Rat)

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC. Ethyl benzene has not been listed as a carcinogen by NTP or OSHA.

Target Organs: In rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study there was mild damage to the kidney (tubular hyperplasia), liver (eosinophilic foci, hypertrophy, necrosis), thyroid (hyperplasia) and pituitary (hyperplasia).

n-Hexane 110-54-3

Acute Toxicity:
- Dermal LD50 = >2,000 mg/kg (Rabbit)
- LC50 > 3,367 ppm (4 hr, Rat)
- Oral LD50 > 5,000 mg/kg (Rat)

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.
**Hydrogen Sulfide 7783-06-4**

**Acute Toxicity:**
- Dermal - No data
- LCLo = 600 ppm, 30 min (Human)

Hydrogen sulfide concentrations will vary significantly depending on the source and sulfur content of the crude. Sweet crudes (<0.5% sulfur) may contain toxicologically significant levels of hydrogen sulfide in the vapor spaces of bulk storage tanks and transport compartments. Concentrations of H$_2$S as low as 10 ppm over an 8 hour workshift may cause eye or throat irritation. Prolonged breathing of 50-100 ppm H$_2$S vapors can produce significant eye and respiratory irritation. Sour crudes commonly contain extremely high concentrations of H$_2$S (500-70,000 ppm) in the vapor spaces of bulk storage vessels. Exposure to 250-600 ppm for 15-30 minutes can produce headache, dizziness, nervousness, staggering gait, nausea and pulmonary edema or bronchial pneumonia. Concentrations >1,000 ppm will cause immediate unconsciousness and death through respiratory paralysis. Rats and mice exposed to 80 ppm H$_2$S, 6 hrs/day, 5 days/week for 10 weeks, did not produce any toxicity except for irritation of nasal passages. H$_2$S did not affect reproduction and development (birth defects or neurotoxicity) in rats exposed to concentrations of 75-80 ppm or 150 ppm H$_2$S, respectively. Over the years a number of acute cases of H$_2$S poisonings have been reported. Complete and rapid recovery is the general rule. However, if the exposure was sufficiently intense and sustained causing cerebral hypoxia (lack of oxygen to the brain), neurologic effects such as amnesia, intention tremors or brain damage are possible.

**Naphthalene 91-20-3**

**Acute Toxicity:**
- Dermal LD$_{50}$ = >2.5 g/kg (rat)
- LC$_{50}$ = >340 mg/m$^3$/1H (rat)
- Oral LD$_{50}$ = 490 mg/kg; 2.6 g/kg (rat)

**Carcinogenicity:** Naphthalene has been evaluated in two year inhalation studies in both rats and rice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

**Toluene 108-88-3**

**Acute Toxicity:**
- Dermal LD$_{50}$ = 14 g/kg (Rabbit)
- LC$_{50}$ = 8,000 ppm (4-hr, Rat) Oral
- LD$_{50}$ = 2.5 - 7.9 g/kg (Rat)

**Target Organs:** Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

**Developmental:** Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. The effects seen include decreased fetal body weight and increased skeletal variations in both inhalation and oral studies.
1,2,4 Trimethyl Benzene  95-63-6

Acute Toxicity:
Dermal LD50 = No data available
LC50 = 18 gm/m³/4hr (Rat)
Oral LD50 = 3-6 g/kg (Rat)

Xylenes   1330-20-7

Acute Toxicity:
Dermal LD50 >3.16 ml/kg (Rabbit)
LC50= 5000 ppm/4 hr. (Rat)
Oral LD50 = 4300 mg/kg (Rat)

Target Organs: A six week inhalation study with xylene produced hearing loss in rats.
Developmental: Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions.

12. ECOLOGICAL INFORMATION

Ecotoxicity
96 hours LL50: 15 mg/l (Fathead Minnow)
96 hours LL50: 18 mg/l (Rainbow Trout)
48 hours EL50: 18 mg/l, 4.5 mg/l (Daphnia magna)
96 hours EL50: 6.4 mg/l (Algae)
72 hours EL50: 3.6 mg/l (Algae)

This material is expected to be toxic to aquatic organisms. In general, this product exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components that are the most prominent in the water soluble fraction and cause aquatic toxicity are also highly volatile and can be readily biodegraded by microorganisms.

Environmental Fate
The individual hydrocarbon components of this material are differentially soluble in water with aromatic hydrocarbons tending to be more water soluble than aliphatic hydrocarbons. If spilled, the lighter components will generally evaporate but depending on local environmental conditions (temperature, wind, soil type, mixing or wave action in water, etc.), photo-oxidation and biodegradation, the remainder may become dispersed in the water column or absorbed to soil or sediment. Because of their differential solubility, the occurrence of hydrocarbons in groundwater will be at different proportions than the parent material.

The potential for bioaccumulation and/or long term persistence of these materials in the environment is low to non-existent. In laboratory soil column experiments, the half-time of gasoline was reported as 1.2 to 2.7 days in sand, loam or clay soils. Microorganisms present in sediments and in the water are capable of degrading hydrocarbons. Simpler hydrocarbons are more readily degraded than complex molecules.
13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not a RCRA "listed" hazardous waste. However, it should be fully characterized for ignitability (D001), reactivity (D003) and benzene (D018) prior to disposal (40 CFR 261). Use which results in chemical or physical change or contamination may subject it to regulation as a hazardous waste. Along with properly characterizing all waste materials, consult state and local regulations regarding the proper disposal of this material.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a qualified drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

<table>
<thead>
<tr>
<th></th>
<th>Shipping Description:</th>
<th>Shipping Name:</th>
<th>Hazard Class and Division:</th>
<th>ID Number:</th>
<th>Packing Group:</th>
<th>Label:</th>
<th>Placard:</th>
<th>Reportable Quantity:</th>
<th>Emergency Response Guide:</th>
<th>MARPOL III Status:</th>
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<tbody>
<tr>
<td>United States Department of Transportation (US DOT)</td>
<td>Petroleum Distillates n.o.s., 3, UN1268, III</td>
<td>Petroleum Distillates n.o.s.</td>
<td>3</td>
<td>UN1268</td>
<td>III</td>
<td>Flammable Liquid</td>
<td>Flammable</td>
<td>None established for this material</td>
<td>128</td>
<td>Not a DOT Marine Pollutant per 49 CFR 171.8</td>
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<tr>
<td>Transportation of Dangerous Goods (TDG) Canada</td>
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<tr>
<td>International Maritime Organization (IMO)</td>
<td>Petroleum Distillates, 3, UN1268, III</td>
<td>Petroleum Distillates n.o.s.</td>
<td>3</td>
<td>UN1268</td>
<td>III</td>
<td>Flammable Liquid</td>
<td>Flammable</td>
<td></td>
<td>128</td>
<td>Not a DOT Marine Pollutant per 49 CFR 71.8</td>
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<td>International Maritime Dangerous Goods Code (IMO/IMDG)</td>
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<tr>
<td>European Agreements Concerning the International Carriage by Rail (RID) and by Road</td>
<td>Petroleum Distillates</td>
<td>3</td>
<td>III</td>
<td>Flammable Liquid</td>
<td>33</td>
<td>1268</td>
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<td>International Civil Aviation Organization / International Air Transport Association (ICAO/IATA)</td>
<td>Petroleum Distillates</td>
<td>UN/ID Number: UN1268</td>
<td>3</td>
<td>III</td>
<td></td>
<td></td>
<td>Flammable Emergency Response Guide: 3H</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
15. REGULATORY INFORMATION

United States Federal Regulatory Information

**EPA TSCA Inventory**
This product and/or its components are listed on the Toxic Substances Control Act (TSCA) Inventory

**EPA SARA 302/304 Emergency Planning and Notification**
This material contains the following chemicals subject to reporting under the Superfund Amendments and Reauthorization Act of 1986 (SARA):
Product is not listed as an extremely hazardous substance

**EPA SARA 311-312 (Title III Hazard Categories)**
Acute Health: Yes
Chronic Health: Yes
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

**Component** | **CAS Number** | **Concentration** | **RQ**
---|---|---|---
Benzene | 71-43-2 | < 3 % | 10 lb
Cyclohexane | 110-82-7 | < 3 % | 1000 lb
Ethyl Benzene | 100-41-4 | < 2 % | 1000 lb
n-Hexane | 110-54-3 | < 7 % | 5000 lb
Naphthalene | 91-20-3 | < 2 % | 100 lb
Toluene | 108-88-3 | < 7 % | 1000 lb
1,2,4 Trimethyl Benzene | 95-63-6 | < 6 % | not listed
Xylene, all isomers | 1330-20-7 | < 15 % | 100 lb

CERCLA Section 101(14) excludes crude oil and crude oil fractions, including hazardous constituents of petroleum, from the definition of hazardous substances. The petroleum exclusion applies to this product.

**EPA CWA and OPA**
This product is classified as an oil under Section 311 of the Clean Water Act (CWA) and Oil Pollution Act of 1990 (OPA), subject to spill reporting requirements.

Canadian Regulatory Information

**DSL/NDSL Inventory**
This product and/or its constituents are listed either on the Domestic Substances List (DSL) or the Non Domestic Substances List (NDSL).

**Workplace Hazardous Materials Information System (WHMIS) Hazard Class**
B2 - Flammable Liquids
D2A - Materials Causing Other Toxic Effects - Very Toxic Material
D2B - Materials Causing Other Toxic Effects - Toxic Material
European Union Regulatory Information

Labeling
Product is dangerous as defined by the European Union Dangerous Substances / Preparations Directives
Contains: Benzene

Symbol
F+ Extremely Flammable
T Toxic

Risk Phrases
R12-45--65-52/53
Extremely flammable. May cause cancer. Irritating to skin. Harmful: may cause lung damage if swallowed. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases
S23-36-28-53-62
Do not breathe vapor. Wear suitable protective clothing. After contact with skin, wash immediately. Avoid exposure - obtain special instructions before use. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

California Proposition 65

This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects or other reproductive harm are created by the combustion of this product. Carcinogens: Benzene, Ethyl Benzene, Naphthalene, Gasoline Engine Exhaust; Developmental Toxicity: Benzene, Toluene; Male Reproductive Toxicity: Benzene

Carcinogen Identification by International Agency for Research on Cancer

Group 1
Carcinogenic to Humans
Benzene

Group 2A
Probably Carcinogenic to Humans

Group 2B
Possibly Carcinogenic to Humans
Ethyl Benzene, Gasoline, Gasoline Engine Exhaust, Naphthalene

Group 3
Not Classifiable
Toluene, Xylenes

16. OTHER INFORMATION

Prepared By J.P. Morgan Ventures Energy Corporation
383 Madison Avenue, 10th floor
New York, NY 10017

Precautionary Label
CONTAINS BENZENE

DANGER!

EXremely FlammABLE LİquID AND VAPOR. HYDROGEN SULFİDE GAS İS TOXiC AND CAN CAUSE DROWSINESS, RESPIRATORY FAILURE AND DEATH AT LOW CONCENTRATION. VAPOR MAY CAUSE FLASH FIRE. CAUSES SKİN IRRITATİON, RESPIRATORY IRRITATİON, HEADACHE, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN
CASES OF EXTREME EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL, IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE. HARMFUL TO AQUATIC ORGANISMS. MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.

OVEREXPOSURE TO BENZENE MAY RESULT IN CANCER, BLOOD DISORDERS, AND DAMAGE TO THE BONE MARROW. EXPOSURE TO HEXANE MAY CAUSE NERVE DAMAGE.

Keep away from heat, sparks, and flame. Avoid all personal contact. Avoid breathing mist or vapor. Hydrogen sulfide deadens sense of smell. Do not get on skin or clothing. Wear oil impervious gloves and clothing. Use with adequate ventilation.

In case of contact, wash skin with soap and water. Immediately remove contaminated clothing, including shoes. Destroy or wash clothing before reuse. If swallowed, seek immediate medical attention. Do not induce vomiting. Only induce vomiting at the instruction of a physician.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. 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 THE INFORMATION PROVIDED ABOVE, 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. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.