

APPENDIX B-2

Emissions Calculations References



Small Business Assistance Program

Colorado Department of Public Health and Environment
<http://www.cdphe.state.co.us/ap/sbap.asp>

A Guide to Air Regulations for: Gasoline and Diesel Fuel Dispensing Stations

Fuel dispensing stations emit substances that are regulated as air pollutants by the Colorado Department of Public Health and Environment, Air Pollution Control Division (Division). This document provides an overview of the air pollution reporting and permitting requirements for gasoline and diesel fuel dispensing stations with underground storage tanks.

➤ AREAS OF CONCERN

Air emission reporting and permitting requirements vary depending on where a source is located. To determine your air requirements, first identify your business area:

- ❑ **Denver 1-Hour Ozone Attainment/Maintenance Area:** Includes all of Denver, Broomfield, Jefferson, Douglas, and Boulder County (excluding Rocky Mountain National Park) and the western portions of Adams and Arapahoe Counties.
- ❑ **All Other Areas of Colorado**

➤ ENVIRONMENTAL CONCERNS

Volatile Organic Compounds (VOCs)

Volatile Organic Compounds contained in gasoline vapor, with sunlight acting as a catalyst, readily combine with oxides of nitrogen to form ozone. Ozone is a regulated pollutant in Colorado. At ground level, ozone is a major ingredient of smog, aggravates heart and respiratory illnesses, and may contribute to the development of various diseases including bronchitis and emphysema.

Hazardous Air Pollutants (HAPs)

Some of the chemicals contained in fuel are classified as HAPs. These chemicals can have detrimental effects on humans and the environment. HAPs in gasoline vapor include, but are not limited to, benzene, methyl tert butyl ether (MTBE¹), hexane, toluene, 2,2,4-trimethyl pentane,

and xylene. These substances have been known to cause headaches, dizziness, difficulty breathing, and an increased risk of cancer and birth defects. Highly concentrated vapor can be emitted when fuel is transferred from tank trucks to underground storage tanks at service stations. It can also be emitted directly into your breathing zone when you refuel your vehicle. The most immediate concern has been benzene because it is a known human carcinogen and is persistent in the atmosphere.

At one time lead was added to gasoline as an anti-knock agent to increase the octane of the fuel. Lead was then found to be a developmental toxicant in humans and regulations were adopted to restrict its use. Most fuels now consist of more highly branched and aromatic compounds that may include a higher benzene content.

¹*Note: The blending MTBE is prohibited in Colorado after April 30, 2002 (Colorado Revised Statutes 25-7-139).*

➤ **REPORTING REQUIREMENTS:**

Air Pollutant Emission Notice (APEN) and Emission Permits (or Construction Permits)

Most operators of gasoline and diesel fuel dispensing stations in Colorado are required to submit an APEN to the Air Pollution Control Division. An APEN is a form used to report a facility's air emissions. The APEN form, titled *Fuel Dispensing Stations-, Air Pollutant Emission Notice (APEN) – and –Application for Construction Permit*, is downloadable at www.cdphe.state.co.us/ap/downloadforms.asp.

✓ **An APEN must be filed under the following conditions:**

- ❖ **In the Denver 1-Hour Ozone Attainment/Maintenance Area:** Gasoline and diesel service stations located in the Denver 1-Hour Ozone Attainment/Maintenance Area (described above) must file an APEN if uncontrolled actual VOC emissions equals or exceeds two tons per year. In addition, these stations must obtain an air permit if VOC emissions equals or exceeds five tons per year.

The air permit will include requirements that approved fittings for a vapor recovery system to be installed on all gasoline storage tanks. The operator must ensure that the tanks are only filled with fuel from a certified delivery truck equipped with an approved vapor recovery system and that the system is properly connected during the entire filling operation. The air permit defines the type of air pollution control measures that will be used, the kinds and amounts of materials used by the facility and any other operating limits that may apply. Fuel dispensing facilities are normally required to maintain records of gasoline dispensed from each tank and maintain vapor recovery equipment/fittings to minimize air emissions.

Exemption: Diesel storage tanks with an annual throughput of less than four hundred thousand gallons are exempt from APEN requirements unless other federal standards

(such as 40 CFR 60, Subpart Kb for storage tanks with design capacities above 75 m³ or approximately 20,000 gallons) apply. (Regulation 3, Section II.E.3.fff.(i)).

- ❖ **All Other Areas of Colorado:** Gasoline and diesel fuel dispensing stations located in all other areas of Colorado must file an APEN if uncontrolled actual VOCs emissions equal or exceed two tons per year. However, these stations are exempt from air permit requirements (Regulation No. 3, Part III.D).

Exemption: Diesel storage tanks with an annual throughput of less than four hundred thousand gallons are exempt from APEN requirements unless other federal standards (such as 40 CFR 60, Subpart Kb for storage tanks with design capacities above 75 m³ or approximately 20,000 gallons) apply. (Regulation 3, Section II.E.3.fff.(i)).

✓ **APEN Calculations**

Operators of gasoline and diesel fuel dispensing stations may calculate annual emissions on the APEN form (see Attachment A) or the Division can calculate this information based on fuel throughput (gallons/year) provided by the source on the APEN. Please contact the Small Business Assistance Program or someone in the Air Pollution Control Division if you have questions.

Hazardous Air Pollutant (**HAP**) emissions must be reported on a **Non-Criteria Reportable Air Pollutant Emission Notice Addendum Form** if they exceed any of the reporting levels specified in Regulation No. 3. Contact the Division at (303) 692-3150 for a list of HAPs and reporting thresholds.

✓ **When to File a Revised APEN**

A Revised APEN must be filed with the Division anytime there is a **significant change** in emissions or a modification in equipment or controls.

- A significant change for **VOC** is an increase of one ton per year over the amount previously reported on an APEN or five percent, whichever is greater (Regulation No. 3, Part A.II.C.2 and .3).
- A significant change for **HAPs** is five tons per year over the amount previously reported, or 50 percent, whichever is less.

A Revised APEN must be filed whenever a permit emission limit is exceeded.

An APEN must be filed (renewed) every five years (or sooner if any of the above situations trigger an APEN revision).

✓ **APEN and Permit Fees**

APEN Filing Fee: A \$119.96 filing fee is required for each APEN submitted, including APENs submitted for administrative changes (e.g., changes in ownership, change in location).

Annual Emission Fee: State law requires all sources which are required to file Air Pollutant Emission Notice to pay an annual fee. The fee is based on the total annual emissions as reported on the most current Air Pollutant Emission Notice the Division has on file. Invoices for these fees will be mailed in May or June of each year. Current annual fees are \$13.54 for each ton of criteria pollutants emitted and \$90.34 for each ton of hazardous air pollutants emitted. These fees are subject to change by the legislature on a yearly basis. The Inventory and Support Unit at the Air Pollution Control Division administers annual emission.

Permit Processing Fee: In addition to the APEN filing fee and annual fee, the Division is required by law to recover the costs of operating the permitting program by charging applicants a processing fee. This fee is based on the amount of time it takes the Division to process the application according to an hourly rate and including costs such as publication of public notice. Effective July 1, 2001, processing fees are \$59.98 per hour.

Please contact the Station Sources Program at (303) 692-3150 or visit the APCD website at: www.cdphe.state.co.us/ap/aphom.asp for current information or questions.

➤ POLLUTION CONTROLS

Stage I Vapor Recovery refers to the process of reclaiming vapor that, in the past, was released into the air when loading fuel into transport vehicles (tankers) at terminals and the unloading of the fuel at the service station. The cargo tank retrieves the vapors displaced during product unloading and transports the vapors through a vapor recovery system (equipment installed to control the release of vapors) or back to the loading terminal (closed loop vapor balance system). A vapor balance system is approved in Colorado if its design and operation are in accordance with provisions in Colorado Regulation No. 7 Section VI.B.

Stage I control applies gasoline stations in the Denver Metro Attainment Maintenance Area. Stage I controls are normally not required in Attainment areas in Colorado outside of the Denver Metro area; however, terminals, bulk stations, and service stations equipped to use Stage I controls are encouraged to use them state-wide to control emissions of volatile organic compounds and hazardous air pollutants. **In areas where vapor recovery equipment is required, the equipment must be utilized at all times.** Failure to properly operate the equipment can result in violations being issued to both the transporter and the owner of the service station or gasoline terminal.

The responsibility for complying with Stage I requirements falls on both the transporter and the recipient of the gasoline. Transporters of gasoline must have their equipment pressure and vacuum tested annually (Regulation No. 7, Section VI.D) to ensure that there are no leaks in the lines or other parts of the tank. This includes hoses, piping, and connections. In addition, the deliverer must ensure that the equipment is properly connected when transferring gasoline from the transport tank to the storage tank. The recipient of the gasoline (usually a service station) must also ensure that the proper equipment has been installed and is in working order. Regularly scheduled inspections and maintenance will help you to stay in compliance with the control requirements and avoid costly and time-consuming enforcement actions.

➤ **HOUSEKEEPING**

Gasoline must not be intentionally spilled, discarded in sewers, stored in open containers, or disposed of in any other manner that would result in evaporation (Regulation No. 7, Section V.B.). If a spill does occur, it should be cleaned up immediately. Spill reporting and clean up procedures must be conducted in accordance with applicable Colorado Regulations.

➤ **RECORD KEEPING**

Annual records of gasoline and diesel throughput (gallons per year) must be maintained by the owner/operator and made available to the Division for inspection upon request. A copy of the most recent Air Pollutant Emission Notice (APEN) and Permit (if required) should be maintained by the owner/operator. Records must be maintained by the owner/operator for at least two years.

➤ **SMALL BUSINESS ASSISTANCE PROGRAM**

The Small Business Assistance Program (SBAP) is available to answer questions you may have regarding environmental issues at your facility. The SBAP can help you understand the regulations, help you determine what your company has to do to be in compliance, help you file required forms, help you complete the APEN process (if required), help you calculate your emissions, or provide information by presenting a workshop for your company or for your industry. Our services are always free and confidential.

**Small Business Assistance Program
Colorado Department of Public Health and Environment**

Home Page: www.cdphe.state.co.us/ap/sbap.asp

Program Contacts:

Joni Canterbury – (303) 692-3175

Margo Griffin – (303) 692-3148



Colorado Department
of Public Health
and Environment

ATTACHMENT A

Calculating Emissions from Underground Storage Tanks

Operators of gasoline and diesel fuel dispensing stations with underground storage tanks may calculate and list emissions of volatile organic compounds (VOCs) on the APEN form or they may request the Division to perform these calculations while processing the permit. To calculate your own emissions, use the following steps:

1. Determine the *actual* throughput (in gallons of fuel per year) for each tank. The actual throughput is the quantity of fuel actually dispensed for the previous calendar year.
2. Determine the *requested* throughput (in gallons of fuel per year) for each tank. The requested throughput will become your permit limit. This number should allow room for your business to grow over the next five years.
3. Determine the type of vapor or emission control at your facility. Examples of emission controls include Stage I Vapor Recovery, Stage II Vapor Recovery, Submerged Pipe Fill, and Splash Fill. Emission factors for various types of fuel and emission controls are provided in Table 1.

Calculate your actual and requested annual VOC emissions by selecting the appropriate emission factor(s) from Table 1 and using the equation in Table 2.

| Table 1 | |
|---|--|
| Emission Factors | |
| Fuel Type and Emission Control | Emission Factor¹ (pounds of VOC per gallon throughput) |
| Gasoline with Stage I Vapor Recovery | 0.013 |
| Gasoline with Stage II Vapor Recovery | 0.0031 |
| Gasoline without Stage I | |
| - With Submerged Pipe Fill | 0.02 |
| - With Splash Fill | 0.0242 |
| Diesel | |
| - With Stage I, Stage II, or Submerged Pipe | 0.000029 |
| - With Splash Fill | 0.000045 |

¹ These emission factors are commonly used to calculate VOC emissions for fuel dispensing stations. The Division reserves the right to use alternate emission factors or methodologies to calculate VOC emissions as warranted by site-specific conditions or other available data.

| Table 2 |
|--|
| Equation for Calculating VOC Emissions |
| $VOC \text{ Emissions} \left(\frac{\text{pounds}}{\text{year}} \right) = \text{Throughput} \left(\frac{\text{gallons}}{\text{year}} \right) \times \text{Emission Factor From Table 1}$ <p>To convert “pounds per year” to “tons per year,” simply divide “pounds per year” by 2000.</p> |

Example Calculation: A service station in Denver has two underground storage tanks with Stage I Vapor Recovery. The first tank, containing gasoline, has an actual throughput of 374,400 gallons per year and a requested throughput of 395,000 gallons per year. The second tank, containing diesel², has an actual throughput of 12,000 gallons per year and a requested throughput of 15,000 gallons per year. Calculate the facility's total VOC emissions in *tons per year* based on the actual and requested throughputs.

VOC Emissions Based on Actual Throughput:

Tank 1 - Gasoline

VOC Emissions = 374,400 (gallons/year) X 0.013 (pounds/gallon) = 4,867 pounds/year

Convert to tons VOC per year: 4,867 (pounds/year) / 2000 (pounds/ton) = 2.43 tons/year

Tank 2 - Diesel

VOC Emissions = 12,000 (gallons/year) X 0.000029 (pounds/gallon) = 0.348 pounds/year

Convert to tons VOC per year: 0.348 (pounds/year) / 2000 (pounds/ton) = 0.00017 tons/year

Total VOC Emissions

2.43 tons/year + 0.00017 tons/year = 2.43 tons/year

VOC Emissions Based on Requested Throughput:

Tank 1 - Gasoline

VOC Emissions = 395,000 (gallons/year) X 0.013 (pounds/gallon) = 5,135 pounds/year

Convert to tons VOC per year: 5,135 (pounds/year) / 2000 (pounds/ton) = 2.57 tons/year

Tank 2 - Diesel

VOC Emissions = 15,000 (gallons/year) X 0.000029 (pounds/gallon) = 0.43 pounds/year

Convert to tons VOC per year: 0.43 (pounds/year) / 2000 (pounds/ton) = 0.00022 tons/year

Total VOC Emissions

2.57 tons/year + 0.00022 tons/year = 2.57 tons/year

² Regulation Number 3 provides some exemptions from air emission reporting and permitting requirements for tanks containing diesel and other fuels. Contact the Division or the Small Business Assistance Program to determine if any exemptions apply to your business.

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SECTION 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION F2

Product Name: **Sinclair Diesel**
Synonyms: No. 2 Diesel Fuel, Ultra Low Sulfur Diesel - Dyed and Undyed, Oil Distillate, Cycle Oil, Fuel Oil, Diesels Cycle Oil, Furnace Oil

CAS Number: ##1 Diesel 8008-20-6; ##2 Diesel 68476-34-6

Chemical Family: Liquid Hydrocarbons

Manufacturer MSDS.: F2
Manufacturer Name: Sinclair Oil Corporation
Address: P.O. Box 30825
 Salt Lake City, Utah 84130

EMERGENCY PHONE: CHEMTREC - (703) 527-3887 (collect)

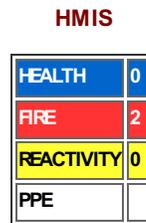
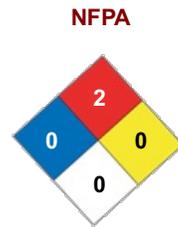
Product Description: APPLICATIONS: Diesel - Dyed Fuel

Business Phone: (888) 340-3466
Business Fax: (801) 524-2740

CHEMTREC Numbers:
For emergencies in the US, call CHEMTREC: 800-424-9300

Revision Date: January 2007.
Trade Names: Diesel

NFPA 704/HMIS:
 (0=insignificant, 1=slight, 2=moderate, 3=high, 4=extreme)



Product Codes:

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SECTION 2 : COMPOSITION, INFORMATION ON INGREDIENTS F2

| Ingredient Name | CAS# | Ingredient Percent |
|---------------------------|------------|---------------------------|
| ##1 Diesel: Toluene | 108-88-3 | Typical: 0-0.5% by Weight |
| EC Index Number: 1 | | |
| ##1 Diesel: Naphthalene | 91-20-3 | Typical: 0-0.5% by Weight |
| EC Index Number: 1 | | |
| ##2 Diesel: Toluene | 108-88-3 | Typical: 0-0.5% by Weight |
| EC Index Number: 1 | | |
| ##2 Diesel: Naphthalene | 91-20-3 | Typical: 0-0.5% by Weight |
| EC Index Number: 1 | | |
| ##1 Diesel | 8008-20-6 | Typical: 100% by Weight |
| EC Index Number: 1 | | |
| ##2 Diesel | 68476-34-6 | Typical: 100% by Weight |
| EC Index Number: 1 | | |

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SECTION 3 : HAZARDS IDENTIFICATION F2

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|----------------------------|--|
| Emergency Overview: | May cause eye, skin and respiratory tract irritation. Combustible liquid and vapor. Harmful or fatal if swallowed. Toxic to aquatic organisms. |
| Physical State: | Liquid |
| Color: | Colorless, red, blue, amber |
| Odor: | Kerosene odor |

Applies to All Ingredients :

| | |
|-----------------------------------|---|
| Potential Health Effects : | Trauma and burns secondary to explosions and fires can result. In enclosed spaces, oxygen may be displaced by vapors or consumed by combustion. Incomplete combustion will produce carbon monoxide and other toxic gases. |
| Eye Contact: | Contact may cause eye irritation. Naphthalene vapor causes eye irritation. |
| Skin Contact: | Contact may irritate or burn skin. Absorption through the skin may cause symptoms of intoxication, followed by kidney damage. |
| Inhalation: | Overexposure may cause weakness, headache, nausea, confusion, blurred vision, drowsiness and other central nervous system effects. |
| Ingestion: | Contact may irritate or burn skin. Absorption through the skin may cause symptoms of intoxication, followed by kidney damage. |

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SECTION 4 : FIRST AID MEASURES F2

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|-------------------------|---|
| Eye Contact: | Flush immediately with water for at least 15 minutes. Seek medical attention promptly. |
| Skin Contact: | Discard contaminated leather articles. Wash contact areas with soap and water. Launder contaminated clothing before reuse. |
| Inhalation: | Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance. If breathing stops, use mouth-to-mouth resuscitation. |
| Ingestion: | DO NOT INDUCE VOMITING. Get medical assistance promptly. (Note to Physician: Material, if aspirated into lungs, may cause chemical pneumonitis. Treat appropriately.) |
| Other First Aid: | GENERAL: Remove all clothing impregnated with material immediately. Consult a physician for major exposures of inhalation or skin contact. |

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SECTION 5 : FIRE FIGHTING MEASURES F2

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| Flash Point: | 100 deg F Minimum |
| Upper Flammable or Explosive Limit: | 6.0 |
| Lower Flammable or Explosive Limit: | 1.3 |
| Auto Ignition Temperature: | 490 deg F - 545 deg F |
| Flammability Class: | Combustible Liquid |
| Hazardous Combustion Byproducts: | May produce carbon monoxide. |
| Fire Fighting Instructions : | Use foam, dry chemical, CO2, water fog or vaporizing liquid (Halon). Keep personnel removed from and up-wind of fire. Cool adjacent structures and storage drums with water spray. Evacuate area. Prevent runoff from fire control dilution from entering streams or drinking water supply. |
| Fire Fighting Equipment: | Use of SCBA in enclosed or confined spaces, or as otherwise needed. Bunker gear. |
| GENERAL HAZARD: | Incomplete burning can produce carbon monoxide. Vapors will be released above flash point and when mixed with air, can burn or explode in confined space if exposed to sources of ignition. |

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SECTION 6 : ACCIDENTAL RELEASE MEASURES F2

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|---------------------|---|
| Land Spill: | Shut off and eliminate all ignition sources. Keep people away. Remove leaking containers to a safe area. Contain and remove by mechanical means. Add sand, earth or other suitable absorbent to spill area than scrape off the ground. Guard against contamination of water supplies. Report spills to appropriate authorities. Dispose of in accordance with Federal, State and Local regulations. |
| Water Spill: | Spill may be removed from water with mechanical dredges or lifts. Report spills to appropriate authorities. Dispose of in accordance with Federal, State and Local regulations. |

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SECTION 7 : HANDLING and STORAGE F2

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| Handling: | When handling use non-sparking tools and equipment. Do not use as a cleaner or solvent, use only as fuel. Do not siphon by mouth. |
| Storage: | Ground and bond all transfer and storage equipment. Drums must be grounded/bonded/equipped with self-closing valves, pressure vacuum bungs and flame arrestors. Store away from ignition sources in a cool area. Outside or detached storage is preferred. |

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SECTION 8 : EXPOSURE CONTROLS, PERSONAL PROTECTION F2

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| Engineering Controls: | Provide ventilation sufficient to prevent exceeding recommended exposure limit or build-up of explosive concentrations of vapor in air. Use explosion-proof equipment. |
| Personal Protective Equipment Routine Handling: | If contact is likely the following protective clothing and equipment is recommended. |
| Protective Clothing/Body Protection: | Use full-face shield, chemical goggles, impervious gloves, boots and whole body protection. |
| Respiratory Protection: | Approved respiratory protection must be used when vapors or mist concentrations are unknown or exceed the TLV. Avoid prolonged or repeated breathing of vapor or mists. |
| Exposure Limits: | <p>COMPONENT: Diesel ACGIH_TLV: 100 mg/M3 NOTATION: A3 OTHER: Skin, Irritation</p> <p>COMPONENT: Toluene OSHA_PEL: 200 ppm CEILING: 300 ppm</p> <p>COMPONENT: Toluene ACGIH_TLV: 50 ppm NOTATION: A4 OTHER: Skin, CNS</p> <p>COMPONENT: Naphthalene OSHA_PEL: 10 ppm</p> <p>COMPONENT: Naphthalene ACGIH_TLV: 10 ppm STEL: 15 ppm NOTATION: A4 OTHER: Skin</p> <p>COMPONENT: Petroleum Distillates (Naphtha) OSHA_PEL: 500 ppm</p> |
| Comments: | <p>A3 = Confirmed Animal Carcinogen with Unknown Relevance to Humans A4 = Not Classified as a Human Carcinogen CNS = Central Nervous System Skin = Absorption through the skin may contribute to overall exposure</p> |

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SECTION 9 : PHYSICAL and CHEMICAL PROPERTIES F2

| | |
|-----------------------------------|--------------------------------|
| Physical State/Appearance: | Liquid |
| Color: | Colorless, red, blue, or amber |
| Odor: | Kerosene odor |
| pH: | Not Applicable |
| Vapor Pressure: | < 1 PSIA |
| Vapor Density: | (Air = 1): > 1 |
| Boiling Point: | 550 deg F |
| Freezing Point: | 0 deg F |
| Solubility: | In Water: No |
| Specific Gravity: | (g/ml): 0.75 - 0.90 |
| Density: | (g/ml): 0.75 - 0.90 |
| Viscosity: | Not Applicable Found |

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SECTION 10 : STABILITY and REACTIVITY F2

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| Chemical Stability: | General: This product is stable. |
| Conditions to Avoid: | Strong acids, alkalis and oxidizers. Avoid heat, sparks, flame and static electricity. |
| Incompatibilities with Other Materials: | MATERIALS TO AVOID: Strong acids, alkalis and oxidizers. Avoid heat, sparks, flame and static electricity. |

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SECTION 11 : TOXICOLOGICAL INFORMATION F2

Applies to All Ingredients :

| | |
|----------------------------|---|
| Eye Effect: | ACUTE: Conjunctivitis and burning, watery eyes have been reported in acute exposures to various hydrocarbon fuels and oils. |
| Skin Effects: | ACUTE: Mild erythema to full thickness chemical burns have occurred after prolonged exposure to various hydrocarbon fuels and oils. |
| Ingestion Effects: | ACUTE: Central nervous system, cardiovascular, and respiratory effects have been reported with acute exposures to various hydrocarbon fuels and oils similar to those reported with inhalation. Nausea, vomiting, cramping and diarrhea may occur. |
| Inhalation Effects: | ACUTE: Headaches, confusion, disorientation, blurred vision occur with inhalation. Higher exposures may cause hallucinations, CNS excitation, drowsiness, CNS depression. Seizure and coma occur from very high exposures and death may result from respiratory depression. ECG changes, cardiac arrhythmias, tachycardia, shock and cardiovascular collapse can occur. Pneumonia, pulmonary edema and hemorrhages can occur. |

| | |
|---|--|
| Chronic Effects: | Inhalation of 8000-16000 mg/m3 for 2 to 4 hours was lethal to rats. |
| Carcinogenicity: | Occupational exposures in petroleum refining are considered Group 2A (probably carcinogenic) by IARC. |
| Other Toxicological Information: | Systemic: Petroleum-derived fuels and fuel oils are complex and variable mixtures of hydrocarbons. In general, the more viscous the mixture, the less toxic it will be. At high level exposures, humans experience multiple organ failures, some of which may be due to hypoxia and secondary to the failure of other organ systems. In humans kidney failure has been noted only at high, acute levels of exposures, and appears reversible. Liver enzymes may be transiently elevated. At lower level exposures, most acute health effects are reversible. People can be exposed by inhalation, ingestion and dermal contact. Frequently, people are exposed by combined dermal and inhalation exposure. |

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SECTION 12 : ECOLOGICAL INFORMATION

F2

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SECTION 13 : DISPOSAL CONSIDERATIONS

F2

| | |
|---------------------------|---|
| Waste Disposal: | Dispose of in accordance with Federal, State, and Local regulations. |
| RCRA Hazard Class: | Disposal of this product or material contaminated with this product may be regulated by RCRA due to the characteristic of ignitability. |
| EPA Waste Number: | EPA Hazard Class: Acute Hazard/Chronic Hazard/Fire Hazard |

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SECTION 14 : TRANSPORT INFORMATION

F2

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|-----------------------------------|---|
| DOT Shipping Information: | DOT (Department of Transportation): |
| DOT Shipping Name: | Combustible Liquid nos (Diesel ##1, Diesel ##2) |
| DOT Hazard Class: | Combustible Liquid |
| DOT Identification Number: | UN 1993 |
| DOT Packing Group: | PG III |
| NAERG Number: | NAERG96 NUMBER: 128 |

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SECTION 15 : REGULATORY INFORMATION

F2

Applies to all ingredients:

| | |
|--|--|
| Section 304: | CERCLA (Comprehensive Environmental Response Compensation and Liability Act): Naphthalene and Toluene are hazardous substances under CERCLA and therefore are subject to emergency notification requirements. |
| Section 312 Hazard Category: | SARA TITLE III (Superfund Amendments and Reauthorization Act): Naphthalene and Toluene are subject to SARA Title III, Sections 311 and 312, which require MSDS reporting and hazardous chemical inventory reporting. |
| Section 313 Toxic Release Form: | Naphthalene and Toluene are also subject to SARA Title III, Section 313, which requires chemical release reporting. |
| OSHA 29 CFR 1200: | MEETS THE REQUIREMENTS OF THE HAZARDOUS COMMUNICATION PROVISIONS OF SARA TITLE III AND 29CFR1910.1200(g) OF THE OSHA REGULATIONS. |

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SECTION 16 : ADDITIONAL INFORMATION

F2

| | |
|----------------------------|---------------|
| HMIS: | |
| Health Hazard: | 0 |
| Fire Hazard: | 2 |
| Reactivity: | 0 |
| NFPA: | |
| Health: | 0 |
| Fire Hazard: | 2 |
| Reactivity: | 0 |
| MSDS Revision Date: | January 2007. |

REVISION SUMMARY: Complete review of MSDS, January 2007.

Disclaimer:

THIS PRODUCT MATERIAL SAFETY DATA SHEET PROVIDES HEALTH AND SAFETY INFORMATION. THE PRODUCT SHOULD BE USED IN APPLICATIONS CONSISTENT WITH THIS PRODUCT LITERATURE. FOR ANY OTHER USES, EXPOSURES SHOULD BE EVALUATED SO THAT APPROPRIATE HANDLING PRACTICES AND TRAINING PROGRAMS CAN BE ESTABLISHED TO ENSURE SAFE WORKPLACE OPERATIONS.

THIS MATERIAL SAFETY DATA SHEET IS PROVIDED IN GOOD FAITH AND MEETS THE REQUIREMENTS OF THE HAZARDOUS COMMUNICATION PROVISIONS OF SARA TITLE III AND 29CFR1910.1200(g) OF THE OSHA REGULATIONS. THE ABOVE INFORMATION IS BASED ON REVIEW OF AVAILABLE INFORMATION SINCLAIR BELIEVES IS RELIABLE AND IS SUPPLIED FOR INFORMATIONAL PURPOSES ONLY. SINCLAIR DOES NOT GUARANTEE ITS COMPLETENESS OR ACCURACY. SINCE CONDITIONS OF USE ARE OUTSIDE THE CONTROL OF SINCLAIR, SINCLAIR DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, AND ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING HEREIN IS INTENDED TO PERMIT INFRINGEMENT OF VALID PATENTS AND LICENSES.

NFPA 704/HMIS:

(0=insignificant, 1=slight, 2=moderate, 3=high, 4=extreme)

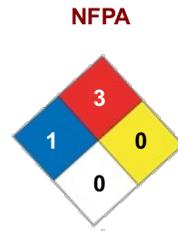
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SECTION 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION F1

Product Name: Gasoline
Synonyms: Regular, Premium, Subgrade, Motor Fuel, Gasohol
CAS Number: 8006-61-9
Chemical Family: Liquid Hydrocarbon
Manufacturer MSDS.: F1
Distributor Name: Sinclair Oil Corporation
Distributor Address: P.O. Box 30825
 Salt Lake City, Utah 84130
 EMERGENCY PHONE: CHEMTREC - (800) 424-9300 or (703) 527-3887 (collect)
 FAX: (801) 524-2740
Distributor Telephone: (888) 340-3466
Revision Date: December 2005
 Supersedes: December 2002
Trade Names: Gasoline
Manufacturer Name: Sinclair Oil Corporation
General Use: APPLICATIONS: Automotive Gasoline
 NFPA 704/HMIS:
 (0 = insignificant, 1 = slight, 2 = moderate, 3 = high, 4 = extreme)



HMIS

| | |
|------------|---|
| HEALTH | 1 |
| FIRE | 3 |
| REACTIVITY | 0 |
| PPE | |

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SECTION 2 : COMPOSITION, INFORMATION ON INGREDIENTS F1

| Ingredient Name | CAS# | Ingredient Percent |
|---|------------|---------------------------|
| Regular Unleaded Gasoline including: EC Index Number: 1 | 8006-61-9 | Typical: 100.0% by Weight |
| Cyclohexane EC Index Number: 1 | 110-82-7 | Typical: 0.5% by Weight |
| Benzene EC Index Number: 1 | 71-43-2 | Typical: 3.0% by Weight |
| Toluene EC Index Number: 1 | 108-88-3 | Typical: 10.0% by Weight |
| Xylene EC Index Number: 1 | 1330-20-7 | Typical: 6.5% by Weight |
| Trimethyl Benzene EC Index Number: 1 | 25551-13-7 | Typical: 7.0% by Weight |
| Napthalene EC Index Number: 1 | 91-20-3 | Typical: 0.2% by Weight |
| Ethyl Alcohol EC Index Number: 1 | 64-17-5 | Typical: 10.0% by Weight |

| | | |
|--------------------------------------|------------|---------------------------|
| Premium Unleaded Gasoline including: | 8006-61-9 | Typical: 100.0% by Weight |
| EC Index Number: | 1 | |
| Cyclohexane | 110-82-7 | Typical: 0.2% by Weight |
| EC Index Number: | 1 | |
| Benzene | 71-43-2 | Typical: 4.0% by Weight |
| EC Index Number: | 1 | |
| Toluene | 108-88-3 | Typical: 13.7% by Weight |
| EC Index Number: | 1 | |
| Xylene | 1330-20-7 | Typical: 12.7% by Weight |
| EC Index Number: | 1 | |
| Trimethyl Benzene | 25551-13-7 | Typical: 11.9% by Weight |
| EC Index Number: | 1 | |
| Napthalene | 91-20-3 | Typical: 0.3% by Weight |
| EC Index Number: | 1 | |
| Ethyl Alcohol | 64-17-5 | Typical: 10.0% by Weight |
| EC Index Number: | 1 | |

Gasoline consists of a complex blend of paraffinic, olefinic, naphthenic, and aromatic hydrocarbons which may contain up to 5% benzene and dosages of multi-functional additives. May contain 0-10% ethanol.

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SECTION 3 : HAZARDS IDENTIFICATION

F1

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| Emergency Overview: | Extremely flammable liquid and vapor. Vapors may cause flash fire. Harmful or fatal if swallowed and may cause lung damage if aspirated. Causes skin and eye irritation. Long term exposure may have caused cancer in laboratory animals. Keep away from children. Toxic to aquatic organisms. |
| Physical State: | Liquid/Vapor |
| Color: | Clear, bronze, Red, yellow, or purple color |
| Odor: | Strong hydrocarbon odor |
| <u>Applies to All Ingredients :</u> | |
| Potential Health Effects: | Trauma and burns secondary to explosions and fires can result. In enclosed spaces, oxygen may be displaced by vapors or consumed by combustion. Incomplete combustion will produce carbon monoxide and other toxic gases. |
| Eye Contact: | May cause eye irritation. |
| Skin Contact: | Contact may irritate or burn skin. Repeated contact may cause skin to become dry & scaly. |
| Inhalation: | High vapor concentrations are possible and can be hazardous on single exposure. Overexposure may cause weakness, headache, nausea, confusion, blurred vision, drowsiness and other central nervous system effects. Extremely high-level exposure may result in dizziness, irregular heartbeat, coma, collapse and death. |
| Ingestion: | If aspirated (liquid enters lung) following ingestion, severe lung irritation and pulmonary edema (swelling of lung tissue) may occur. Aspiration may also result in central nervous system depression or excitement. Serious, permanent lung damage may result. Nausea, vomiting, diarrhea, or abdominal pain may occur following ingestion. |
| Carcinogenicity: | Gasoline mixtures are not listed as carcinogenic by NTP, OSHA and, ACGIH. Gasoline mixtures are listed as a possible carcinogen by IARC (2B) and NIOSH. Benzene is listed as a confirmed human carcinogen by IARC, NTP, OSHA, NIOSH |

[To Top of page](#)**SECTION 4 : FIRST AID MEASURES****F1**

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|----------------------|---|
| Eye Contact: | Flush immediately with water for at least 15 minutes. Seek medical attention promptly. |
| Skin Contact: | Discard contaminated leather articles. Wash contact areas with soap and water. Launder contaminated clothing before reuse. |
| Inhalation: | Remove from further exposure. If unconsciousness occurs, seek immediate medical assistance. If breathing stops, use mouth-to-mouth resuscitation. |
| Ingestion: | DO NOT INDUCE VOMITING. Get medical assistance promptly. (Note to Physician: Material, if aspirated into lungs, may cause chemical pneumonitis. Treat appropriately.) |

[To Top of page](#)**SECTION 5 : FIRE FIGHTING MEASURES****F1**

| | |
|--|---|
| Flash Point: | -45 deg F |
| Upper Flammable or Explosive Limit: | 7.6% |
| Lower Flammable or Explosive Limit: | 1.4% |
| Auto Ignition Temperature: | 530 deg F+ |
| Flammability Class: | Flammable Liquid |
| Hazardous Combustion Byproducts: | May produce carbon monoxide. |
| Fire Fighting Instructions: | Use CO2, foam, dry chemical, Halon, or water fog. Keep personnel removed from and up-wind of fire. Cool adjacent structures and storage drums with water spray. Evacuate area. Prevent runoff from fire control dilution from entering streams or drinking water supply. A vapor suppressing foam may be used to reduce vapors. |
| Fire Fighting Equipment: | Fire fighters should use SCBA and full protective equipment (Bunker gear). GENERAL HAZARD: Incomplete burning can produce carbon monoxide. This is an extremely flammable liquid; vapor accumulation could flash and/or explode if it comes into contact with open flame. |

[To Top of page](#)**SECTION 6 : ACCIDENTAL RELEASE MEASURES****F1**

| | |
|---------------------|---|
| Land Spill: | Treat spill as an oil spill. Eliminate all sources of ignition. Remove leaking containers to a safe area. Contain and remove by mechanical means. Guard against contamination of water supplies. Report spills to appropriate authorities. Dispose of in accordance with Federal, State, and Local regulations. |
| Water Spill: | Treat spill as an oil spill. Report spills to appropriate authorities. Dispose of in accordance with Federal, State, and Local regulations. |

[To Top of page](#)**SECTION 7 : HANDLING and STORAGE****F1**

| | |
|------------------|--|
| Handling: | When handling, use non-sparking tools and equipment. Do not use as a cleaner or solvent. Use only as motor fuel. DO NOT SIPHON BY MOUTH. |
| Storage: | Ground and bond all transfer and storage equipment. Drums must be grounded/bonded/equipped with self-closing valves, pressure vacuum bungs and flame arrestors. Store away from ignition sources in a cool area. Outside or detached storage is preferred. Containers should be labeled: FLAMMABLE. VAPOR HARMFUL. Improper filling of portable gasoline containers creates a danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground while filling. Ensure pump nozzle is in contact with the container while filling. Do not use the nozzle's lock open device. Do not fill portable containers that are inside a vehicle or trailer/truck bed. |

[To Top of page](#)**SECTION 8 : EXPOSURE CONTROLS, PERSONAL PROTECTION****F1**

| | |
|--|---|
| Engineering Controls: | Assure adequate natural or mechanical ventilation. Eliminate all sources of ignition. |
| Personal Protective Equipment Routine Handling: | If contact is likely, the following protective clothing and equipment is recommended. |
| Protective Clothing/Body Protection: | Use full-face shield, chemical goggles, impervious gloves, boots, and whole-body protection. |
| Respiratory Protection: | Approved respiratory protection must be used when vapors or mist concentrations are unknown or exceed the TLV. Avoid prolonged or repeated breathing of vapor or mists. |
| Exposure Limits: | COMPONENT: Gasoline LIMIT: ACGIH_TLV TWA : 300ppm STEL: 500ppm NOTATION: A3 COMPONENT: Gasoline |

LIMIT: OSHA_PEL
TWA: 300ppm

COMPONENT: Gasoline
LIMIT: ACGIH_TLV
TWA: 100ppm
OTHER: CNS

COMPONENT: Benzene
LIMIT: OSHA_PEL
TWA: 1ppm
STEL: 5ppm

COMPONENT: Benzene
LIMIT: OSHA_Z2
TWA: 10ppm
CEILING: 25ppm

COMPONENT: Benzene
LIMIT: ACGIH_TLV
TWA: 0.5ppm
STEL: 2.5ppm
NOTATION: A1
OTHER: Skin

COMPONENT: Toluene
LIMIT: OSHA_PEL
TWA: 200ppm
CEILING: 300ppm

COMPONENT: Toluene
LIMIT: ACGIH_TLV
TWA: 50ppm
NOTATION: A4
OTHER: Skin, CNS

COMPONENT: Xylene
LIMIT: OSHA_PEL
TWA: 100ppm

COMPONENT: Xylene
LIMIT: ACGIH_TLV
TWA: 100ppm
STEL: 150ppm
NOTATION: A4
OTHER: Irritation

COMPONENT: Trimethyl Benzene
LIMIT: ACGIH_TLV
TWA: 25ppm
OTHER: Irritation, CNS

COMPONENT: Naphthalene
LIMIT: OSHA_PEL
TWA: 10ppm

COMPONENT: Naphthalene
LIMIT: ACGIH_TLV
TWA: 10ppm
STEL: 15ppm
NOTATION: A4
OTHER: Skin

COMPONENT: Ethyl Alcohol
LIMIT: OSHA_PEL
TWA: 1000ppm

COMPONENT: Ethyl Alcohol
LIMIT: ACGIH_PEL
TWA: 1000ppm
NOTATION: A4
OTHER: Irritation

A1=Confirmed Human Carcinogen
A3=Confirmed Animal Carcinogen with Unknown Relevance to Humans
A4=Not Classified as a Human Carcinogen
CNS=Central Nervous System
Skin=Absorption through the skin may contribute to overall exposure

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SECTION 9 : PHYSICAL and CHEMICAL PROPERTIES

F1

| | |
|-------------------|--------------------------------|
| Color: | Clear/bronze/red/yellow/purple |
| Physical State: | Liquid |
| pH: | Not Applicable |
| Vapor Pressure: | 7-15 PSIA |
| Vapor Density: | (Air=1): > 1 |
| Boiling Point: | 230 deg F |
| Freezing Point: | -76 deg F |
| Solubility: | IN WATER: Negligible |
| Specific Gravity: | (g/ml): 0.65 – 0.75 |
| Density: | (g/ml): 0.65 – 0.75 |

**SECTION 10 : STABILITY and REACTIVITY**

F1

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|--|---|
| Chemical Stability: | This product is stable |
| Conditions to Avoid: | Avoid Halogens, strong acids, alkalies, and oxidizers. Also keep away from heat, sparks, flame and static electricity. |
| Incompatibilities with Other Materials: | MATERIALS TO AVOID: Avoid Halogens, strong acids, alkalies, and oxidizers. Also keep away from heat, sparks, flame and static electricity. |
| Hazardous Decomposition Products: | Incomplete burning can produce carbon monoxide |

**SECTION 11 : TOXICOLOGICAL INFORMATION**

F1

Applies to All Ingredients :

| | |
|---|---|
| Eye Effect: | ACUTE: Eye irritation to atomized gasoline has been noted at 200, 500 and 1000 mg/m for 30 minutes and after an 8-hour exposure to 140 ppm. Atomized gasoline has the same composition as liquefied gasoline while gasoline vapors are different. Conjunctivitis has been reported after 1 hour of exposure to 900 ppm. |
| Skin Effects: | ACUTE: Mild erythema to full thickness chemical burns have occurred after prolonged exposure to various hydrocarbon fuels and oils. |
| Ingestion Effects: | ACUTE: Central nervous system, cardiovascular, and respiratory effects have been reported with acute exposures to various hydrocarbon fuels and oils similar to those reported with inhalation. Nausea, vomiting, cramping and diarrhea may occur. |
| Inhalation Effects: | ACUTE: Headaches, confusion, disorientation, blurred vision occur with inhalation. Higher exposures may cause hallucinations, CNS excitation, drowsiness, CNS depression. Seizure and coma occur from very high exposures and death may result from respiratory depression. ECG changes, cardiac arrhythmias, tachycardia, shock and cardiovascular collapse can occur. Pneumonia, pulmonary edema and hemorrhages can occur. |
| Chronic Effects: | Chronic exposure results in kidney damage in male rats. However, this damage appears to be related to a protein produced in large amounts in male rats, but not in humans or female rats. Occupational exposures in petroleum refining are considered Group 2A (probably carcinogenic) by IARC. Liver and kidney tumors have been noted in animals. Data is less clear in humans because of confounding factors in epidemiological studies. Some components (e.g. benzene) are known carcinogens. Contains benzene, a known human carcinogen, which can be toxic to the blood and blood-forming organs. |
| Other Toxicological Information: | SYSTEMIC: Petroleum-derived fuels and fuel oils are complex and variable mixtures of hydrocarbons. In general, the more viscous the mixture, the less toxic it will be. At high-level exposures, humans experience multiple organ failures, some of which may be due to hypoxia and secondary to the failure of other organ systems. In humans, kidney failure has been noted only at high, acute levels of exposures and appears reversible. Liver enzymes may be transiently elevated. At lower level exposures, most acute health effects are reversible. People can be exposed by inhalation, ingestion and dermal contact. Frequently, people are exposed by combined and inhalation exposure. |

**SECTION 12 : ECOLOGICAL INFORMATION**

F1

**SECTION 13 : DISPOSAL CONSIDERATIONS**

F1

| | |
|---------------------------|--|
| Waste Disposal: | Dispose of in accordance with Federal, State, and Local regulations. |
| RCRA Hazard Class: | Disposal of this product or material contaminated with this product may be regulated by RCRA due to the characteristic of ignitability or due to the toxicity characteristic of benzene (D018). EPA Hazard Class: Acute Hazard/Chronic Hazard/Fire Hazard |

**SECTION 14 : TRANSPORT INFORMATION**

F1

| | |
|-----------------------------------|--------------------|
| DOT Shipping Name: | Gasoline |
| DOT Hazard Class: | 3 Flammable Liquid |
| DOT Identification Number: | UN 1203 |
| DOT Packing Group: | II |
| NAERG Number: | 128 |

**SECTION 15 : REGULATORY INFORMATION**

F1

Applies to all ingredients:

Section 304: CERCLA (Comprehensive Environmental Response Compensation and Liability Act): The following components are hazardous substances in CERCLA and therefore are subject to emergency notification requirements:
Benzene
Cyclohexane
Naphthalene
Toluene
Xylene

Section 312 Hazard Category: SARA TITLE III (Superfund Amendments and Reauthorization Act): The following components are subject to SARA Title III, Sections 311 and 312, which require MSDS reporting and hazardous chemical inventory reporting:
Benzene
Cyclohexane
Ethyl Alcohol
Naphthalene
Toluene
Trimethyl Benzene
Xylene

Section 313 Toxic Release Form: The following components are subject to SARA Title III, Section 313, which requires chemical release reporting:
Benzene
Cyclohexane
Methy-tert-butyl ether
Naphthalene
Toluene
Trimethyl Benzene
Xylene

OSHA 29 CFR 1200: The following components are subject to OSHA 29CFR1910.1200 Hazard Communication Standard:
Benzene* 1
Cyclohexane 2
Ethyl Alcohol 2
Naphthalene 2
Toluene 2
Trimethyl Benzene 2
Xylene 2

(1)* Benzene has been identified by NIOSH, IARC, NTP as a human carcinogen. Refer to 29CFR1910.1000 Table Z-2 and 29CFR1910.1028 for information.

(2) Consult MSDS or NIOSH Occupational Guidelines for more information.

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SECTION 16 : ADDITIONAL INFORMATION

F1

HMIS:

Health Hazard: 1 = Slight
Fire Hazard: 3 = High
Reactivity: 0 = Insignificant

NFPA:

Health: 1 = Slight
Fire Hazard: 3 = High
Reactivity: 0 = Insignificant

MSDS Revision Date: December 2005
Supersedes: December 2002

REVISION SUMMARY:
Complete review of MSDS, December 2002.

Disclaimer:

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NFPA 704/HMIS:
(0 = insignificant, 1 = slight, 2 = moderate, 3 = high, 4 = extreme)

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