

1. Identification

Material name	GASOLINE
MSDS number	10103
Version #	03
Revision date	01-10-2012
Synonym(s)	APPLICABLE TO ALL OCTANE GRADES * BLUE PLANET® * CONVENTIONAL BLENDSTOCK * CONVENTIONAL BLENDSTOCK FOR OXYGENATE BLENDING (CBOB) * CONVENTIONAL GASOLINE * FINISHED GASOLINE * GASOHOL * MOTOR FUEL * NO LEAD GASOLINE * REFORMULATED GASOLINE (RFG) * REFORMULATED GASOLINE BLENDSTOCK * REFORMULATED BLENDSTOCK FOR OXYGENATE BLENDING (RBOB) * UNLEADED GASOLINE
Manufacturer	Flint Hills Resources Corpus Christi, LLC P. O. Box 2608 Corpus Christi, TX 78403 United States
Telephone numbers - 24 hour emergency assistance	Chemtrec 800-424-9300 Flint Hills Resources Corpus Christi, LLC 361-241-4811
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2. Hazards identification

Emergency overview	DANGER! CLEAR, COLORLESS TO LIGHT COLORED LIQUID WITH AROMATIC ODOR HEALTH HAZARDS VAPORS MAY CAUSE EYE AND RESPIRATORY TRACT IRRITATION BREATHING HIGH CONCENTRATIONS CAN CAUSE IRREGULAR HEARTBEATS WHICH MAY BE FATAL MAY BE HARMFUL OR FATAL IF SWALLOWED MAY CAUSE LUNG DAMAGE OVEREXPOSURE MAY CAUSE CNS DEPRESSION DANGER-CONTAINS BENZENE-CANCER HAZARD CAN CAUSE LEUKEMIA AND OTHER BLOOD DISORDERS SEE "TOXICOLOGICAL INFORMATION" (SECTION 11) FOR MORE INFORMATION FLAMMABILITY HAZARDS EXTREMELY FLAMMABLE LIQUID AND VAPOR VAPOR MAY CAUSE FLASH FIRE OR EXPLOSION REACTIVITY HAZARDS STABLE
Potential health effects	
Routes of exposure	Inhalation, ingestion, skin and eye contact.
Eyes	Contact may cause pain and severe reddening and inflammation of the conjunctiva. Effects may become more serious with repeated or prolonged contact.
Skin	Contact may cause reddening, itching and inflammation. Skin contact may cause harmful effects in other parts of the body.

Inhalation

Breathing this material is harmful and can cause death depending on level and duration of exposure. May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Breathing high concentrations of this material, for example, in a confined space or by intentional abuse, can cause irregular heartbeats which can cause death.

Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information" (Section 11).

Ingestion

Swallowing this material may be harmful. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

3. Composition/information on ingredients

Components	CAS #	Concentration*
GASOLINE	Mixture	100 %
XYLENE	1330-20-7	1 - 15 %
TOLUENE	108-88-3	1 - 15 %
ETHYL ALCOHOL	64-17-5	0 - 10 %
CUMENE	98-82-8	0 - 10 %
N-HEXANE	110-54-3	0 - 7 %
1,2,4-TRIMETHYLBENZENE	95-63-6	0 - 3 %
BENZENE	71-43-2	0 - 2.3 %
ETHYLBENZENE	100-41-4	0 - 2 %
CYCLOHEXANE	110-82-7	0 - 1 %
NAPHTHALENE	91-20-3	0 - 1 %

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

Composition comments

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Flint Hills Resources, LP representative.

4. First aid measures**First aid procedures****Eye contact**

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. GET IMMEDIATE MEDICAL ATTENTION.

Skin contact Immediately wash skin with plenty of soap and water after removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

Inhalation Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR).

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

Ingestion Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor for breathing difficulty.

Never give anything by mouth to an unconscious person.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

Notes to physician INHALATION: This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

INGESTION: If ingested this material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

5. Fire-fighting measures

Flammable properties Material will burn in a fire.

Extremely flammable. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back.

Static accumulator (nonconductive) flammable or combustible liquid may form ignitable vapor-air mixtures in storage tanks. Bonding and grounding may be insufficient to eliminate the hazard from static accumulation.

Explosion hazard if exposed to extreme heat.

Extinguishing media

Suitable extinguishing media Use water spray, dry chemical, carbon dioxide or fire-fighting foam for Class B fires to extinguish fire.

Protection of firefighters

Specific hazards arising from the chemical Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors, and other decomposition products in the case of incomplete combustion.

Fire fighting equipment/instructions Shut off source of flow, if possible.

Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor, cool adjacent structures, and to protect personnel attempting to stop a leak.

Containers can build up pressure if exposed to heat (fire). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Be aware that a BLEVE (Boiling Liquid Expanding Vapor Explosion) may occur unless surfaces are kept cool with water.

Firefighters must wear NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

6. Accidental release measures

Environmental precautions

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If material is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released material. Notify local authorities and the National Response Center, if required.

If the material is spilled or allowed to leak from storage or containment it can contaminate soil and ground water. Ensure the storage or containment equipment is suitable for safely holding this material.

Other information

Keep unnecessary people away. Isolate area for at least 50 meters (164 feet) in all directions to preserve public safety. For large spills, if downwind consider initial evacuation for at least 300 meters (1000 feet).

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal.

Use a vapor suppressing foam to reduce vapors. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

Emergency action

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 800 meters (1/2 mile) in all directions if tank, rail car or tank truck is involved in fire. Evacuate area endangered by release as required. (See Exposure Controls/Personal Protection, Section 8.)

7. Handling and storage

Handling

Electrostatic charge may accumulate and create a hazardous condition when handling this material.

Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (such as tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate procedures to mitigate the hazard.

Static accumulator (nonconductive) flammable or combustible liquid may form ignitable vapor-air mixtures in storage tanks. Bond and ground lines and equipment (tank, transfer lines, pump, floats, etc.) used during transfer to reduce the possibility of static spark-initiated fire or explosion.

Bonding and grounding may be insufficient to eliminate the hazard from static accumulation. Additional precautions should be considered consistent with the current NFPA 77, Recommended Practice on Static Electricity, the current API Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents and OSHA Standard 29 CFR 1910.106, Flammable and Combustible Liquids.

Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

Storage

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain material residue. Do not reuse without adequate precautions.

Do not eat, drink or smoke in areas of use or storage.

8. Exposure controls / personal protection

Occupational exposure limits

ACGIH

Components

1,2,4-TRIMETHYLBENZENE (95-63-6)

BENZENE (71-43-2)

CUMENE (98-82-8)

CYCLOHEXANE (110-82-7)

ETHYL ALCOHOL (64-17-5)

Type

TWA

STEL

TWA

TWA

STEL

Value

25.0 ppm

2.5 ppm

0.5 ppm

50.0 ppm

100.0 ppm

1000.0 ppm

Form

Skin

Skin

Skin

Components	Type	Value	Form
ETHYLBENZENE (100-41-4)	STEL	125.0 ppm	
	TWA	20.0 ppm	
GASOLINE (Mixture)	STEL	500.0 ppm	
	TWA	300.0 ppm	
NAPHTHALENE (91-20-3)	STEL	15.0 ppm	Skin
	TWA	10.0 ppm	Skin
N-HEXANE (110-54-3)	TWA	50.0 ppm	Skin
TOLUENE (108-88-3)	TWA	20.0 ppm	
XYLENE (1330-20-7)	STEL	150.0 ppm	
	TWA	100.0 ppm	

U.S. - OSHA

Components	Type	Value	Form
BENZENE (71-43-2)	STEL	5.0 ppm	Skin
	TWA	1.0 ppm	Skin
CUMENE (98-82-8)	TWA	50.0 ppm	Skin
CYCLOHEXANE (110-82-7)	TWA	300.0 ppm	
ETHYL ALCOHOL (64-17-5)	TWA	1000.0 ppm	
ETHYLBENZENE (100-41-4)	TWA	100.0 ppm	
NAPHTHALENE (91-20-3)	TWA	10.0 ppm	
N-HEXANE (110-54-3)	TWA	500.0 ppm	
TOLUENE (108-88-3)	Ceiling	300.0 ppm	
	TWA	200.0 ppm	
XYLENE (1330-20-7)	TWA	100.0 ppm	

U.S. - Minnesota (MNOSHA)

Components	Type	Value
1,2,4-TRIMETHYLBENZENE (95-63-6)	TWA	25.0 ppm
BENZENE (71-43-2)	STEL	5.0 ppm
	TWA	1.0 ppm
CUMENE (98-82-8)	TWA	50.0 ppm
CYCLOHEXANE (110-82-7)	TWA	300.0 ppm
ETHYL ALCOHOL (64-17-5)	TWA	1000.0 ppm
ETHYLBENZENE (100-41-4)	STEL	125.0 ppm
	TWA	100.0 ppm
GASOLINE (Mixture)	STEL	500.0 ppm
	TWA	300.0 ppm
NAPHTHALENE (91-20-3)	STEL	15.0 ppm
	TWA	10.0 ppm
N-HEXANE (110-54-3)	TWA	50.0 ppm
TOLUENE (108-88-3)	STEL	150.0 ppm
	TWA	100.0 ppm
XYLENE (1330-20-7)	STEL	150.0 ppm
	TWA	100.0 ppm

U.S. - Alaska (AKOSH)

Components	Type	Value
1,2,4-TRIMETHYLBENZENE (95-63-6)	TWA	25.0 ppm
BENZENE (71-43-2)	STEL	5.0 ppm
	TWA	1.0 ppm
CUMENE (98-82-8)	TWA	50.0 ppm
CYCLOHEXANE (110-82-7)	TWA	300.0 ppm
ETHYL ALCOHOL (64-17-5)	TWA	1000.0 ppm
ETHYLBENZENE (100-41-4)	STEL	125.0 ppm
	TWA	100.0 ppm
GASOLINE (Mixture)	STEL	500.0 ppm
	TWA	300.0 ppm
NAPHTHALENE (91-20-3)	STEL	15.0 ppm
	TWA	10.0 ppm
N-HEXANE (110-54-3)	TWA	50.0 ppm
TOLUENE (108-88-3)	STEL	150.0 ppm

Components	Type	Value
XYLENE (1330-20-7)	TWA	100.0 ppm
	STEL	150.0 ppm
	TWA	100.0 ppm

Exposure guidelines NOTE: Only ingredients with validated exposure limits are shown in section 8.

US ACGIH Threshold Limit Values: Skin designation

BENZENE (CAS 71-43-2)	Can be absorbed through the skin.
NAPHTHALENE (CAS 91-20-3)	Can be absorbed through the skin.
N-HEXANE (CAS 110-54-3)	Can be absorbed through the skin.

Engineering controls Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

Personal protective equipment

Eye / face protection Keep away from eyes. Eye contact can be avoided by using chemical safety glasses, goggles and/or face shield. Have eye washing facilities readily available where eye contact can occur.

Skin protection Dermal exposure to this chemical may add to the overall exposure.

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Additional protective clothing may be necessary.

Good personal hygiene practices such as properly handling contaminated clothing, using wash facilities before entering public areas and restricting eating, drinking and smoking to designated areas are essential for preventing personal chemical contamination.

Respiratory protection A NIOSH approved air purifying respirator with an appropriate cartridge or canister, such as an organic vapor cartridge, may be used in circumstances where airborne organic vapor concentrations may exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. See OSHA 29 CFR 1910.134 for more information regarding respiratory protection and Assigned Protection Factors (APFs).

9. Physical and chemical properties

Color	Clear, colorless to light colored
Odor	Aromatic
Odor threshold	Not available
Physical state	Liquid
Form	Not available
pH	Essentially Neutral
Melting point	-130 °F (-90 °C)
Freezing point	Not available
Boiling point	> 100 °F (> 37.8 °C) @ 10% Evap. (D86) - Summer; >90 °F (32.22 °C) @ 10% Evap. (D86) - Winter
Flash point	-45 °F (-42.8 °C)
Evaporation rate	Moderately Fast
Flammability	Not available
Flammability limits in air, upper, % by volume	7.6 %
Flammability limits in air, lower, % by volume	1.2 %
Vapor pressure	5.2 - 15 psi at 100 °F (38 °C)
Vapor density	3 - 4 (Air=1)
Specific gravity	0.69 - 0.77 at 60/60 °F (15.6/15.6 °C)
Relative density	Not available
Solubility (water)	Negligible
Solubility (organic solvent)	Not available
Partition coefficient (n-octanol/water)	Not available

Auto-ignition temperature	536 - 853 °F (280 - 456.1 °C)
Decomposition temperature	Not available
VOC	Not available
Pour point	Not available
Viscosity	Not available
Bulk density	Not available
Conductivity	< 50 pS/m (Gasoline without Ethanol) > 2000 pS/m (Gasoline with Ethanol)
Surface tension	Not available
Dissociation constant	Not available
Percent volatile	100 %
Explosivity	Not available
Hydrolysis	Not available
Granulometry	Not available
Molecular weight	Not available
Molecular formula	Mixture
Chemical family	Hydrocarbon and Hydrocarbon/Alcohol Mixtures

10. Stability and reactivity

Chemical stability	Material is stable under normal conditions.
Conditions to avoid	Avoid unventilated areas, heat, open flames, sparks and ungrounded electrical equipment.
Incompatible materials	Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).
Hazardous decomposition products	Not anticipated under normal conditions.
Possibility of hazardous reactions	Not anticipated under normal conditions.

11. Toxicological information

Carcinogenicity

ACGIH Carcinogens

BENZENE (CAS 71-43-2)	A1 Confirmed human carcinogen.
ETHYL ALCOHOL (CAS 64-17-5)	A3 Confirmed animal carcinogen with unknown relevance to humans.
ETHYLBENZENE (CAS 100-41-4)	A3 Confirmed animal carcinogen with unknown relevance to humans.
NAPHTHALENE (CAS 91-20-3)	A4 Not classifiable as a human carcinogen.
TOLUENE (CAS 108-88-3)	A4 Not classifiable as a human carcinogen.
XYLENE (CAS 1330-20-7)	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

BENZENE (CAS 71-43-2)	1 Carcinogenic to humans.
CUMENE (CAS 98-82-8)	2B Possibly carcinogenic to humans.
ETHYL ALCOHOL (CAS 64-17-5)	1 Carcinogenic to humans.
ETHYLBENZENE (CAS 100-41-4)	2B Possibly carcinogenic to humans.
NAPHTHALENE (CAS 91-20-3)	2B Possibly carcinogenic to humans.
TOLUENE (CAS 108-88-3)	3 Not classifiable as to carcinogenicity to humans.
XYLENE (CAS 1330-20-7)	3 Not classifiable as to carcinogenicity to humans.

US NTP Report on Carcinogens: Anticipated carcinogen

NAPHTHALENE (CAS 91-20-3)	Anticipated carcinogen.
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US NTP Report on Carcinogens: Known carcinogen

BENZENE (CAS 71-43-2)	Known carcinogen.
ETHYL ALCOHOL (CAS 64-17-5)	Known carcinogen.

US OSHA Specifically Regulated Substances: Cancer hazard

BENZENE (CAS 71-43-2)	Cancer hazard.
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Pre-existing conditions aggravated by exposure	Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, blood, bone marrow, blood forming organs, respiratory tract, liver, and peripheral nervous system.
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Toxicological data

1,2,4-TRIMETHYLBENZENE: The following information pertains to a mixture of C9 aromatic hydrocarbons, over 40% of which was composed of 1,2,4-trimethylbenzene. A developmental inhalation study was conducted in laboratory mice. Increased implantation losses, reduced fetal weights, delayed ossification and an increased incidence of cleft palate were observed at the highest exposure level (1,500 ppm). This exposure level was extremely toxic to pregnant female mice (44% mortality). Reduced fetal body weights were also observed at 500 ppm. A multi-generation reproduction inhalation study was conducted in laboratory rats. Reductions in pup weights, pup weight gain, litter size, and pup survival were observed at 1,500 ppm, an exposure level at which significant maternal toxicity was observed. Reduced pup weight gain was also observed at 500 ppm. Embryotoxicity has been reported in studies of laboratory animals. Adverse effects included increased implantation losses, reduced fetal weights, delayed ossification and an increased incidence of cleft palate.

BENZENE: Studies of Workers Overexposed to Benzene: Studies of workers exposed to benzene show clear evidence that overexposure can cause cancer of the blood forming organs (acute myelogenous leukemia) and aplastic anemia, an often fatal disease. Some studies suggest overexposure to benzene may also be associated with other blood disorders including myelodysplastic syndrome. Some studies of workers exposed to benzene have shown an association with increased rates of chromosome aberrations in circulating lymphocytes. One study of women workers exposed to benzene suggested a weak association with irregular menstruation. However, other studies of workers exposed to benzene have not demonstrated clear evidence of an effect on fertility or reproductive outcome in humans. Benzene can cross the placenta and affect the developing fetus. Cases of aplastic anemia have been reported in the offspring of persons severely overexposed to benzene. Studies in Laboratory Animals: Studies in laboratory animals indicate that prolonged, repeated exposure to high levels of benzene vapor can cause bone marrow suppression and cancer in multiple organ systems. Studies in laboratory animals show evidence of adverse effects on male reproductive organs following high levels of exposure but no significant effects on reproduction have been observed. Embryotoxicity has been reported in studies of laboratory animals but effects were limited to reduced fetal weight and skeletal variations. Benzene has been classified as a proven human carcinogen by OSHA and a Group 1 (Carcinogenic to Humans) material by IARC.

CUMENE: Overexposure to cumene may cause upper respiratory tract irritation and CNS depression. Studies in laboratory animals indicate evidence of respiratory tract hyperplasia, and adverse effects on the liver, kidney and adrenal glands following high level exposure. The relevance of these findings to humans is not clear at this time. Findings from lifetime inhalation studies in laboratory rodents were as follows: In F344/N rats: an increased incidence of renal carcinomas and adenomas, respiratory epithelial adenomas, and interstitial cell adenomas of the testes. In B6C3F1 mice: an increased incidence of carcinomas and adenomas of the bronchi and lung, liver neoplasms, hemangiosarcomas of the spleen, and adenomas of the thyroid. IARC has classified cumene as "possibly carcinogenic to humans" (Group 2B).

CYCLOHEXANE: Cyclohexane has been the focus of substantial testing in laboratory animals. Cyclohexane tested negative in various genotoxicity 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 but a careful re-evaluation 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 ALCOHOL: Repeated ingestion of ethanol can result in alcohol abuse, causing behavioral changes, memory loss, impaired judgement, decreased appetite, irregular heartbeats, and decreased fertility. Prolonged and repeated ingestion of ethanol has also been associated with cancers of the mouth, pharynx, esophagus and liver. Ethanol ingestion by pregnant women can cause miscarriage, low birth weight, premature birth and fetal alcohol syndrome. In males, acute and chronic alcohol ingestion may affect gonadal hormone levels. It may also affect the liver, kidney, brain, blood and cardiovascular system.

ETHYLBENZENE: Findings from a 2-year inhalation study in rodents conducted by NTP were as follows: Effects were observed only at the highest exposure level (750 ppm). At this level the incidence of renal tumors was elevated in male rats (tubular carcinomas) and female rats (tubular adenomas). The incidence of tumors was also elevated in male mice (alveolar and bronchiolar carcinomas) and female mice (hepatocellular carcinomas). IARC has classified ethyl benzene as "possibly carcinogenic to humans" (Group 2B). Studies in laboratory animals indicate some evidence of post-implantation deaths following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals indicate limited evidence of renal malformations, resorptions, and developmental delays following high levels of maternal exposure. The relevance of these findings to humans is not clear at this time. Studies in laboratory animals have demonstrated evidence of ototoxicity (hearing loss) following exposure levels as low as 300 ppm for 5 days. Studies in laboratory animals indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland.

NAPHTHALENE: Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with Glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as a Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

N-HEXANE: Long-term or repeated exposure to n-hexane can cause peripheral nerve damage. Initial symptoms are numbness of the fingers and toes. Also, motor weakness can occur in the digits, 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.

TOLUENE: Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects. Abuse of toluene at high concentrations (e.g., glue sniffing and solvent abuse) has been associated with adverse effects on the liver, kidney and nervous system, and can cause CNS depression, cardiac arrhythmias, and death. Studies of workers indicate longterm exposure may be related to impaired color vision and hearing. Some studies of workers suggest longterm exposure may be related to neurobehavioral and cognitive changes. Some of these effects have been observed in laboratory animals following repeated exposure to high levels of toluene. Several studies of workers suggest longterm exposure may be related to small increases in spontaneous abortions and changes in some gonadotropic hormones. However, the weight of evidence does not indicate toluene is a reproductive hazard to humans. Studies in laboratory animals indicate some changes in reproductive organs following high levels of exposure, but no significant effects on mating performance or reproduction were observed. Case studies of persons abusing toluene suggest isolated incidences of adverse effects on the fetus including birth defects. Findings in laboratory animals have been largely negative. Positive findings include small increases in minor skeletal and visceral malformations and developmental delays following very high levels of maternal exposure. Studies of workers indicate long-term exposure may be related to effects on the liver, kidney and blood, but these appear to be limited to changes in serum enzymes and decreased leukocyte counts. Adverse effects on the liver, kidney, thymus and nervous system were observed in animal studies following very high levels of exposure. The relevance of these findings to humans is not clear at this time.

XYLENES, ALL ISOMERS: Overexposure to xylene may cause upper respiratory tract irritation, headache, cyanosis, blood serum changes, CNS damage and narcosis. Effects may be increased by the use of alcoholic beverages. Evidence of liver and kidney impairment were reported in workers recovering from a gross overexposure. Effects from Prolonged or Repeated Exposure: Impaired neurological function was reported in workers exposed to solvents including xylene. Studies in laboratory animals have shown evidence of impaired hearing following high levels of exposure. Studies in laboratory animals suggest some changes in reproductive organs following high levels of exposure but no significant effects on reproduction were observed. Studies in laboratory animals indicate skeletal and visceral malformations, developmental delays, and increased fetal resorptions following extremely high levels of maternal exposure. The relevance of these observations to humans is not clear at this time. Adverse effects on the liver, kidney, bone marrow (changes in blood cell parameters) were observed in laboratory animals following high levels of exposure. The relevance of these observations to humans is not clear at this time.

GASOLINE: Wholly vaporized unleaded gasoline produced an increased incidence of liver cancers in female mice and kidney cancers in male rats following a two-year inhalation period. Subsequent investigations indicate that kidney damage, linked to kidney cancer, may be specific to the male rat. Neither result is considered by the U.S. EPA to be useful for assessing human health risk. Gasoline was negative in both in vitro and in vivo mutagenicity assays, and was negative in inhalation developmental and reproductive toxicity studies. IARC has determined that there is limited evidence for the carcinogenicity of unleaded gasoline in experimental animals and inadequate evidence in humans. (IARC Class-2B) Solvent extracts of gasoline exhaust particles produced skin cancer in laboratory animals leading IARC to categorize gasoline engine exhaust as a possible human cancer hazard. (IARC Class 2B).

NAPHTHAS: In a large epidemiological study on over 15,000 employees at several petroleum refineries and amongst residents located near these refineries, no increased risk of kidney cancer was observed in association with gasoline exposures (a similar material). In a similar study, no increased risk of kidney cancer was observed among petroleum refinery workers, but there was a slight trend in the incidence of kidney cancers among service station employees, especially after a 30-year latency period.

ISOPARAFFINS: Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, indepth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.

Altered mental state, drowsiness, peripheral motor neuropathy, irreversible brain damage (so-called Petrol Sniffers Encephalopathy), delirium, seizures, and sudden death have been reported from repeated overexposure to some hydrocarbon solvents, naphthas, and gasoline.

Exposure to this material may cause adverse effects or damage to the following organs or organ systems: central nervous system, blood, bone marrow, heart, immune system, kidneys, liver, lungs, thymus, lymphatic system, pituitary gland, thyroid, mucous membranes, respiratory tract, reproductive organs, testes, skin, eyes, and peripheral nervous system.

12. Ecological information

Ecotoxicity	Toxic to aquatic organisms.
Persistence and degradability	Readily biodegradable in the environment. The presence of ethanol in this product may impede the biodegradation of benzene, toluene, ethylbenzene and xylene in groundwater, resulting in elongated plumes of these constituents.
Bioaccumulation / Accumulation	Not likely to bioaccumulate in aquatic organisms.
Mobility in environmental media	May move through soil and reach groundwater. May partition into air, soil and water. This material evaporates readily.

13. Disposal considerations

Disposal instructions

This material, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability and benzene content. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the material to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with federal regulations. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

For additional handling information and protection of employees, see Section 7 (Handling and Storage) and Section 8 (Exposure Controls/Personal Protection).

14. Transport information

DOT

Basic shipping requirements:

UN number	UN1203
Proper shipping name	Gasoline
Hazard class	3
Packing group	II
Labels required	Flammable Liquid
Placards required	Flammable Liquid, UN1203

Additional information:

ERG number	128
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DOT

General

The above description may not cover shipping in all cases, please consult 49 CFR 100-185 for specific shipping information.

15. Regulatory information

US federal regulations

All ingredients are on the TSCA inventory, or are not required to be listed on the TSCA inventory.

Consult OSHA's Benzene standard 29 CFR 1910.1028 for provisions on air monitoring, employee training, medical monitoring, etc.

A release of this material, as supplied, may be exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA - 40 CFR 302) by the petroleum exclusion. Releases may be reportable to the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5).

This material contains toxic chemical(s) in excess of the applicable de minimis concentration that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372). This information must be included in all MSDSs that are copied and distributed for this material.

This material contains one or more substances listed as hazardous air pollutants under Section 112 of the Clean Air Act. This material contains up to 53% hazardous air pollutants (HAPs) per Section 112 Clean Air Act Amendments of 1990.

Check local, regional or state/provincial regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

1,2,4-TRIMETHYLBENZENE (CAS 95-63-6)	1.0 %
BENZENE (CAS 71-43-2)	0.1 %
CUMENE (CAS 98-82-8)	1.0 %
CYCLOHEXANE (CAS 110-82-7)	1.0 %
ETHYLBENZENE (CAS 100-41-4)	0.1 %
NAPHTHALENE (CAS 91-20-3)	0.1 %
N-HEXANE (CAS 110-54-3)	1.0 %
TOLUENE (CAS 108-88-3)	1.0 %
XYLENE (CAS 1330-20-7)	1.0 %

CERCLA (Superfund) reportable quantity

XYLENE: 100.0 pounds
TOLUENE: 1000.0 pounds
N-HEXANE: 5000.0 pounds
BENZENE: 10.0 pounds
ETHYLBENZENE: 1000.0 pounds
CYCLOHEXANE: 1000.0 pounds
NAPHTHALENE: 100.0 pounds
CUMENE: 5000.0 pounds

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - Yes
 Pressure Hazard - No
 Reactivity Hazard - No

State regulations WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

16. Other information

NFPA ratings Health: 1
 Flammability: 3
 Instability: 0

HMIS® ratings Health: 2*
 Flammability: 3
 Physical hazard: 0
 * Indicates chronic health hazard

Disclaimer NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. Adequate training and instruction should be given by you to your employees and affected personnel. Appropriate warnings and safe handling procedures should be provided by you to handlers and users. Additionally, the user should review this information, satisfy itself as to its suitability and completeness, and pass on the information to its employees or customers in accordance with the applicable federal, state, provincial or local hazard communication requirements. This MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, vendor neither assumes nor retains any responsibility for any damage or injury resulting from abnormal use, from any failure to adhere to appropriate practices, or from any hazards inherent in the nature of the material. Moreover, unless an employee or a customer accesses or receives a MSDS directly from the company, there is no assurance that a document obtained from alternate sources is the most currently available MSDS.

Further information WARNING -- WARNING: THIS PRODUCT, AS INDICATED, CONTAINS ETHANOL. ETHANOL, OR FUELS BLENDED WITH ETHANOL, MAY DAMAGE OR HARM FUEL STORAGE TANKS, PIPING, METERS, ENGINES AND/OR RELATED FUEL SYSTEMS (INCLUDING, BUT NOT LIMITED TO MARINE EQUIPMENT). IT IS IMPERATIVE THAT BEFORE YOU USE OR STORE THIS PRODUCT YOU CONDUCT AN ASSESSMENT TO DETERMINE WHETHER THIS FUEL IS COMPATIBLE WITH YOUR PARTICULAR EQUIPMENT/MACHINERY IN WHICH THIS FUEL MIGHT BE STORED, TRANSPORTED OR COMBUSTED.

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**This data sheet contains
changes from the previous
version in section(s):**

Hazards Identification
Physical & Chemical Properties
Toxicological Information
Transport Information
Regulatory Information
Material Attributes & Uses; Experimental Data
Flint Hills Resources, LP - Operations EH&S

Completed by