

EMERGENCY RESPONSE

FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

CAUTION: Hydrogen (UN1049), Deuterium (UN1957) and Hydrogen, refrigerated liquid (UN1966) burn with an invisible flame. Hydrogen and Methane mixture, compressed (UN2034) may burn with an invisible flame.

Small Fire

- Dry chemical or CO₂.

Large Fire

- Water spray or fog.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent spreading of vapors through sewers, ventilation systems and confined areas.
- Isolate area until gas has dispersed.

CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

FIRST AID

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
- Move victim to fresh air.
- Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- Clothing frozen to the skin should be thawed before being removed.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- Keep victim calm and warm.

Safety Data Sheet

Section 1: Identification

Product identifier

- Product Name** • **Natural Gas**
- Synonyms** • Natural gas-dry; Pipeline gas
- SDS Number/Grade** • NG 2008-01

Relevant identified uses of the substance or mixture and uses advised against

- Recommended use** • Residential, commercial and industrial heating, industrial feedstock, power generation and vehicle transportation

Details of the supplier of the safety data sheet

- Manufacturer** • NW Natural
220 NW 2nd Ave.
Portland, OR 97209
United States
www.nwnatural.com
- Telephone (General)** • 800-422-4012

Emergency telephone number

- Manufacturer** • 800-882-3377

Section 2: Hazard Identification

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

- OSHA HCS 2012** • Flammable Gases 1 - H220
Compressed Gas - H280
Simple Asphyxiant

Label elements

OSHA HCS 2012

DANGER



- Hazard statements** • Extremely flammable gas - H220
Contains gas under pressure; may explode if heated - H280
May displace oxygen and cause rapid suffocation.

Precautionary statements

- Prevention** • Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210
- Response** • Leaking gas fire: Do not extinguish, unless leak can be stopped safely. - P377
Eliminate all ignition sources if safe to do so. - P381

Description of first aid measures

Inhalation

- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

Skin

- Although exposure is unlikely, in case of contact immediately flush skin with running water. If skin irritation develops get medical advice/attention.

Eye

- First aid is not expected to be necessary if material is used under ordinary conditions and as recommended. If irritation develops and persists, get medical attention.

Ingestion

- Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Notes to Physician

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. A potential health hazard associated with this gas is anoxia.

Section 5: Fire-Fighting Measures

Extinguishing media

Suitable Extinguishing Media ● Dry Chemical, (Potassium Bicarbonate based *Purple K* most effective), Carbon dioxide, Water.

Unsuitable Extinguishing Media ● No data available

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards ● EXTREMELY FLAMMABLE
Will form explosive mixtures with air.
Vapors may travel to source of ignition and flash back.
Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
Containers may explode when heated.
Ruptured cylinders may rocket.

Hazardous Combustion Products ● No data available

Advice for firefighters

- Gas fires should not be extinguished unless flow of gas can be stopped. Only authorized personnel should turn off valves or attempt repairs. Fire crews should wear self-contained breathing apparatus (SCBA). Natural gas is lighter than air and will vent upward but special consideration should be given to areas that may trap or contain explosive concentrations including areas of potential migration underground or through structures. Water mist may be used to cool surrounding structures including compressed gas cylinders or tanks.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Personal Precautions ● Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not touch or walk through spilled material. Ventilate the area before entry.

Emergency Procedures ● ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Stop leak if you can do it without risk. Keep unauthorized personnel away. Keep out of low areas. Stay upwind. **LARGE SPILL:**

(124-38-9)	STELs	30000 ppm STEL	30000 ppm STEL; 54000 mg/m3 STEL	Not established
Propane (74-98-6)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	1000 ppm TWA; 1800 mg/m3 TWA	1000 ppm TWA; 1800 mg/m3 TWA
Ethane (74-84-0)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	Not established	Not established
Hydrogen sulfide (7783-06-4)	Ceilings	Not established	10 ppm Ceiling (10 min); 15 mg/m3 Ceiling (10 min)	20 ppm Ceiling
	STELs	5 ppm STEL	Not established	Not established
	TWAs	1 ppm TWA	Not established	Not established
Methane (74-82-8)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)	Not established	Not established

Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof - electrical, ventilating and/or lighting equipment.

Personal Protective Equipment

Respiratory

- In case of insufficient ventilation, wear suitable respiratory equipment. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear safety glasses.

Skin/Body

- Wear leather gloves when handling cylinders.

Environmental Exposure Controls

- Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene
 NIOSH = National Institute of Occupational Safety and Health
 OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limits are based on 15-minute exposures
 TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description			
Physical Form	Gas	Appearance/Description	Colorless, tasteless gas that has no odor or if trace amounts of sulfur compounds are added as an odorant the gas has a garlic/rotten-egg/skunk odor.
Color	Colorless	Odor	Odorless or with trace amounts of sulfur compounds added as an odorant resulting in a garlic/rotten-egg/skunk odor.
Odor Threshold	No data available		
General Properties			

2-Methylbutane (In Liquid form) (< 0.1%)	78-78-4	Acute Toxicity: Inhalation-Rat LC50 • 280000 mg/m ³ 4 Hour(s)
Pentane (< 0.1%)	109-66-0	Acute Toxicity: Ingestion/Oral-Rat LD50 • >2000 mg/kg
Hexane (< 0.1%)	110-54-3	Acute Toxicity: Ingestion/Oral-Rat LD50 • 25 g/kg; Inhalation-Rat LC50 • 48000 ppm 4 Hour(s); Irritation: Eye-Rabbit • 10 mg • Mild irritation
Carbon dioxide (0.3%)	124-38-9	Acute Toxicity: Inhalation-Rat LC50 • 470000 ppm 30 Minute(s); Reproductive: Inhalation-Rat TCLo • 6 pph 24 Hour(s)(10D preg); <i>Reproductive Effects:Specific Developmental Abnormalities:Musculoskeletal system; Reproductive Effects:Specific Developmental Abnormalities:Cardiovascular (circulatory) system; Reproductive Effects:Specific Developmental Abnormalities:Respiratory system</i>

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012 • No data available
Aspiration Hazard	OSHA HCS 2012 • No data available
Carcinogenicity	OSHA HCS 2012 • No data available
Germ Cell Mutagenicity	OSHA HCS 2012 • No data available
Skin corrosion/Irritation	OSHA HCS 2012 • No data available
Skin sensitization	OSHA HCS 2012 • No data available
STOT-RE	OSHA HCS 2012 • No data available
STOT-SE	OSHA HCS 2012 • No data available
Toxicity for Reproduction	OSHA HCS 2012 • No data available
Respiratory sensitization	OSHA HCS 2012 • No data available
Serious eye damage/Irritation	OSHA HCS 2012 • No data available

Route(s) of entry/exposure • Inhalation, Skin, Eye, Ingestion

Potential Health Effects

Inhalation

Acute (Immediate)

- If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

Chronic (Delayed)

- No data available

Skin

Acute (Immediate)

- Under normal conditions of use, no health effects are expected.

Chronic (Delayed)

- Under normal conditions of use, no health effects are expected.

Eye

Acute (Immediate)

- Under normal conditions of use, no health effects are expected.

Chronic (Delayed)

- Under normal conditions of use, no health effects are expected.

Ingestion

Acute (Immediate)

- Ingestion is not anticipated to be a likely route of exposure to this product.

Chronic (Delayed)

- Ingestion is not anticipated to be a likely route of exposure to this product.

Safety, health and environmental regulations/legislation specific for the substance or mixture**SARA Hazard Classifications** • Acute, Fire, Pressure(Sudden Release of)

Inventory		
Component	CAS	TSCA
2-Methylbutane (In Liquid form)	78-78-4	Yes
2-Propanethiol, 2-methyl-	75-66-1	Yes
Butane	106-97-8	Yes
Carbon dioxide	124-38-9	Yes
Ethane	74-84-0	Yes
Hexane	110-54-3	Yes
Hydrogen sulfide	7783-06-4	Yes
Isobutane	75-28-5	Yes
Methane	74-82-8	Yes
Methyl ethyl sulfide	624-89-5	Yes
Nitrogen	7727-37-9	Yes
Pentane	109-66-0	Yes
Propane	74-98-6	Yes

United States**Labor****U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals**

• Hydrogen sulfide	7783-06-4	1500 lb TQ
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Methane	74-82-8	Not Listed
• 2-Propanethiol, 2-methyl-	75-66-1	Not Listed
• Methyl ethyl sulfide	624-89-5	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Nitrogen	7727-37-9	Not Listed

• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Methane	74-82-8	Not Listed
• 2-Propanethiol, 2-methyl-	75-66-1	Not Listed
• Methyl ethyl sulfide	624-89-5	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Hydrogen sulfide	7783-06-4	500 lb TPQ
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Methane	74-82-8	Not Listed
• 2-Propanethiol, 2-methyl-	75-66-1	Not Listed
• Methyl ethyl sulfide	624-89-5	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Hydrogen sulfide	7783-06-4	1.0 % de minimis concentration
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	1.0 % de minimis concentration
• Nitrogen	7727-37-9	Not Listed
• Methane	74-82-8	Not Listed
• 2-Propanethiol, 2-methyl-	75-66-1	Not Listed
• Methyl ethyl sulfide	624-89-5	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Methane	74-82-8	Not Listed
• 2-Propanethiol, 2-methyl-	75-66-1	Not Listed
• Methyl ethyl sulfide	624-89-5	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Methane	74-82-8	Not Listed
• 2-Propanethiol, 2-methyl-	75-66-1	Not Listed
• Methyl ethyl sulfide	624-89-5	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Hydrogen sulfide	7783-06-4	Not Listed
• Pentane	109-66-0	Not Listed
• Ethane	74-84-0	Not Listed
• 2-Methylbutane (In Liquid form)	78-78-4	Not Listed
• Isobutane	75-28-5	Not Listed
• Carbon dioxide	124-38-9	Not Listed
• Propane	74-98-6	Not Listed
• Butane	106-97-8	Not Listed
• Hexane	110-54-3	Not Listed
• Nitrogen	7727-37-9	Not Listed
• Methane	74-82-8	Not Listed
• 2-Propanethiol, 2-methyl-	75-66-1	Not Listed
• Methyl ethyl sulfide	624-89-5	Not Listed

Section 16 - Other Information

- Last Revision Date** ● 17/June/2014
- Preparation Date** ● 26/February/2006
- Disclaimer/Statement of Liability** ● The data contained in this SDS are believed to be accurate, but are not so warranted whether or not they originated at NW Natural. Recipients of this SDS are advised to confirm ahead of time that the data are current and suitable to their needs.