



SAFETY DATA SHEET

1. Product and Company Identification

Material name	Natural Gas - Odorized
Revision date	September 9, 2019
SDS number	SWG SDS 1
Product use	Fuel gas.
Manufacturer/Supplier	Southwest Gas Corporation P.O. Box 98510, Las Vegas, NV 89150-0002 Telephone: (702) 876-7011 Contact Person: Corporate Safety Department
Emergency	877-860-6020

2. Hazards Identification

Physical state	Gas.
Appearance	Colorless gas.
Odor	Gassy, sulfurous, rotten egg type odor.
Emergency overview	DANGER Flammable gas - may cause flash fire. Gas reduces oxygen available for breathing.
OSHA regulatory status	This product is hazardous according to OSHA 29 CFR 1910.1200.
Potential health effects	
Routes of exposure	Inhalation.
Eyes	Pressurized gas, and contaminants within piping, may cause mechanical injury.
Skin	Pressurized gas, and contaminants within piping, may cause mechanical injury.
Inhalation	Sufficient concentrations can displace oxygen in the air and can cause symptoms of oxygen deprivation (asphyxiation), including unconsciousness.
Ingestion	Not applicable.
Target organs	Not applicable.
Chronic effects	Not applicable.
Signs and symptoms	Not applicable.
Potential environmental effects	Not expected to be harmful to aquatic organisms.



3. Composition / Information on Ingredients

Components	CAS #	Percent
Natural Gas	8006-14-2	100

(Includes a blend of tertiary-Butyl Mercaptan and Tetrahydrothiophene of <0.1% mole; ≤5 grains total sulfur per standard cubic foot)

Primary constituents of natural gas	CAS #	Percent
Butane	106-97-8	Varies
Carbon dioxide	124-38-9	Varies
Ethane	74-84-0	Varies
Methane	74-82-8	Varies
Pentane	109-66-0	Varies
Propane	74-98-6	Varies

4. First Aid Measures

First aid procedures

Eye contact	Not applicable. No effects expected.
Skin contact	Not applicable. No effects expected.
Inhalation	Remove victim to fresh air. If not breathing, clear airway and start mouth-to-mouth artificial respiration or use a bag-mask respirator. Get immediate medical attention. If the victim is having trouble breathing, transport to medical care and if available, give supplemental oxygen.
Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely.
Notes to physician	Provide general supportive measures and treat symptomatically.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties	Flammable gas. Gas forms mixtures with air which can ignite and burn with explosive violence. Gas is lighter than air and explosive mixtures may occur if gas is released into enclosed or confined areas. Gas leaking from underground piping may travel through soil and into nearby structures and underground facilities, and may create explosion hazards within those structures. Gas entry into sewer, conduit, or abandoned underground pipe may create explosion hazards within those underground facilities and within structures attached to those underground facilities.
Extinguishing media	
Suitable extinguishing media	Extinguish with carbon dioxide, dry powder, or foam.
Unsuitable extinguishing media	Water may be ineffective on flames but useful for other purposes, including cooling.

Protection of firefighters

Specific hazards arising from the chemical

During fire, combustion gases may be formed that are hazardous to health.

Protective equipment and precautions for firefighters

Evacuate area and fight fire from a safe distance. Extinguish the fire by stopping the flow of gas. If leak is from Southwest Gas facilities, do not stop the flow of gas but call the appropriate Southwest Gas emergency number for gas control assistance. The gas could form an explosive mixture with air and re-ignite resulting in a sudden violent flash fire, which may cause far more damage than if the original fire had been allowed to burn.

Specific methods

In the event of fire or explosion do not breathe fumes. Do not enter a gaseous or suspected gaseous environment without first checking the gas concentration with a properly calibrated combustible gas indicator. If gas is detected, do not enter without first eliminating potential ignition sources (see Section 6); without appropriate lockout-tagout safeguards; without appropriate personal protective equipment, such as flame resistant clothing that is treated to avoid static buildup; without an emergency retrieval-system (defined in Section 16), such as a harness with a retrieval line; without self-contained or supplied breathing air; and without a fire-watch (defined in Section 16) stationed outside the gaseous environment that is equipped with an appropriate fire suppressant.

6. Accidental Release Measures

General

Any suspected natural gas leak requires immediate emergency action.

Hazard recognition

Natural gas is likely to be present if a sulfurous or unusual odor, like rotten eggs is detected. A dangerous concentration of natural gas may be present if the odor is constant or momentary, or if the odor is strong or slight. **Extreme caution is called for since the potential for death or serious injury from a flash fire or explosion is very great if a leak, a suspected leak, or odor is ignored.**

As explained in Section 7, persons should not rely solely on their sense of smell to determine if a gas leak exists or if natural gas is present. Other indications that a natural gas leak may be present and that call for extreme caution include: damaged or worn hoses, fittings, or other connections to a gas appliance or piping; discolored or dead vegetation over or near pipelines; dirt or water being thrown in the air; hissing, whistling, or roaring sound near a gas pipe; bubbling water (including water in a toilet bowl); burning soil; a fire or explosion near a pipeline; an exposed pipe after an earthquake, flood, or other natural disaster; or physical symptoms from exposure that may include dizziness, light-headedness, headache, nausea, loss of coordination, or eye irritation.

Emergency action

Immediately stop all hot-work (defined in Section 16). Immediately evacuate all personnel from all suspected leak areas and areas that may be impacted by the ignition of natural gas. Activate the evacuation procedures of the facility's Emergency Action Plan, but do not activate any electric alarm or communication systems. Secure all such areas to prevent entry or reentry. From a safe location, call 911 and Southwest Gas at (877) 860-6020 and follow the instructions given.

Prevention of ignition

All existing **ignition sources**, including but not limited to open **flames** or **embers** (such as water heaters, fire in boilers, pilot lights, blow torches, matches, candles, lighters, cigarettes, cigars or pipes), should be extinguished if it is possible to do so without entering the suspected leak area.

Static electricity discharges and **electrical arcing** can be potential ignition sources and should be avoided. If it can be done safely, turn off the gas supply to the affected equipment or piping system and disconnect any electrical supply at a circuit breaker or elsewhere outside the affected structure or area. However, do not do so without first verifying the absence of gas in the switch with a properly calibrated combustible gas indicator. Sources of static electricity and electrical arcing include, but are not limited to, torch igniters, cutting or welding, friction of certain clothing; charges within natural gas and gas piping; the use of tools that are

not spark-proof, the use of equipment that is not explosion-proof (or is not within explosion-proof enclosures), and the use of non-intrinsically safe electrical switches, illumination, thermostats, fans, motors (including motor operated doors), battery operated equipment, and electronic equipment.

Hot surfaces that are at or above the auto-ignition temperature can be potential ignition sources and should be cooled if it is possible to do so without entering the suspected leak area.

Precautions for entering a gaseous environment

Do not enter a gaseous or suspected gaseous environment without first checking the gas concentration with a properly calibrated combustible gas indicator. If gas is detected, do not enter without first eliminating potential ignition sources; without appropriate lockout-tagout safeguards; without appropriate personal protective equipment, such as flame resistant clothing that is treated to avoid static buildup; without an emergency retrieval-system (defined in Section 16), such as a harness with a retrieval line; without self-contained breathing air; and without a fire-watch (defined in Section 16) stationed outside the gaseous environment that is equipped with an appropriate fire suppressant.

Precautions if the release is from Southwest Gas operated pipelines or facilities

If the release is from Southwest Gas operated pipelines or facilities:

- Move to a safe location and call 911 and Southwest Gas at (877) 860-6020
- Communicate requested information to Southwest Gas emergency dispatch
- Secure the area and keep persons and traffic from entering
- Wait for the Fire Department and Southwest Gas emergency crews to arrive
- Don't enter the area where natural gas is escaping
- Don't smoke or use lighters or matches
- Eliminate sources of ignition, such as sparks or flames
- Don't move equipment, or turn it on or off, near the release
- Don't attempt to repair any damage or control the flow of natural gas
- Don't attempt to extinguish a fire should ignition occur

Additional reference information

NFPA 329, *Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases* (2020).

7. Handling and Storage

General

Southwest Gas adheres to United States Department of Transportation (DOT) and all applicable state rules and regulations regarding the odorizing of natural gas. **Decades of experience has established that the addition of chemical odorants to natural gas has proven to be a safe, reliable and effective means to warn of the presence of leaks.** However, this odorization is only one phase of protection and so one should not rely on their sense of smell alone to determine if there is a gas leak or other dangerous concentrations of natural gas; other practices for minimizing and locating gas leaks should be employed. Specifically, odorization provides added protection by allowing persons to detect the presence of natural gas, but is not a substitute for proper installation, use, protection, and upkeep of gas systems and appliances. All gas pipe should be designed, installed and inspected as required by the applicable fire code, plumbing code, mechanical code, fuel gas code and administrative code prior to operation. After installation, all gas pipe should be properly maintained and protected from damage because the primary cause of leakage from underground gas pipes is damage by third parties. Please see the back of the bill to obtain information about the need to inspect, maintain and repair customer-owned service lines that are not maintained by Southwest Gas. Appliance and equipment manufacturers' instruction manuals should be followed for their recommended installation, operation, maintenance, and inspection practices, even if those practices conflict with the practices contained in this safety data sheet.

Other Precautions

Impaired sense of smell and environmental conditions that reduce odorant effectiveness

As noted above, persons should not rely solely on their sense of smell to determine if a gas leak exists or if natural gas is present. Some persons may not be able to detect the added odorant because they have a diminished or impaired sense of smell or olfactory fatigue. It has been reported that exposure to extreme cold may temporarily impair the ability to smell. Some people suffer from temporary or permanent anosmia. That is, they have no sense of smell. When a person's ability to smell natural gas odorant is in doubt, the person may undergo an evaluation by a physician or other licensed health care professional.

Certain environmental conditions including competing odors may cover up or mask the smell of odorized gas.

Special precautions, including but not limited to the use of gas detection equipment, should be taken by persons using odorized gas or persons who may be exposed to planned or accidental releases of odorized gas, where those persons have a diminished or impaired sense of smell or work in environments that may mask or reduce the effectiveness of the odorant.

Odor fade

Certain conditions cause **odor fade**, a phenomenon that causes the odorant to diminish so that it is not as detectable and, in some cases, is not detectable at all. Persons should not rely on their sense of smell alone to detect the presence of natural gas without first considering the presence or absence of conditions that may cause odor fade and without advance consideration of the potential for the creation or presence of a flammable concentration of odor-faded gas. **Odor fade (loss of odorant)** occurs when the level of odorant in the gas is reduced due to physical and/or chemical processes including adsorption, absorption and oxidation. This causes the effectiveness of odorant as a warning agent to be reduced. In piping systems conveying dry natural gas, like that delivered by Southwest Gas, odor fade occurs predominantly in installations of new pipe rather than in pipe that has been in continuous use. It is generally more pronounced in new steel pipe of larger diameters and longer lengths with intermittent, little or no gas flow through the piping system over an extended period of time. Other factors that may cause odor fade in a gas piping system include: the construction and configuration of the gas piping system; the presence of rust, moisture, liquids or other substances in the pipe; and gas composition, pressure and/or flow.

In industrial, commercial, and public applications and in large residential applications such as housing tracts and residential towers, new pipeline installations may require periodic purging, the conditioning of the pipe, or fuel gas system modifications (including pressure reduction) during start-up operations to prevent occurrences of odor fade. If Southwest Gas conditioned the customer's pipe before it was placed into service, contact Southwest Gas for instruction on work controls and personal protective equipment recommendations before cutting the pipe with an oxyacetylene torch or welding pipe that is near to, and downstream of, the odorant injection point(s).

If a natural gas leak occurs underground, the surrounding soil may cause odor fade. Inspections for underground gas leaks should include looking for discolored or dead vegetation over or near pipe areas.

Immediately call the appropriate Southwest Gas emergency number (Section 1) if odor-faded gas is detected or suspected and follow the instructions given by the emergency dispatch.

Purging gas piping

Gas piping should only be purged by a licensed professional that is fully trained and knowledgeable about safe gas purging practices, the proper use of gas detectors, and the danger of relying on the sense of smell alone to detect the presence of gas during purging operations. An improperly performed purge may cause serious bodily injury or death to the person(s) performing the purge and to all other persons in the affected area.

Piping purges shall be performed in accordance with Section 8.3 of NFPA 54, *National Fuel Gas Code* or with NFPA 56, *Standard for Fire Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems*, as applicable.

Immediately call the Southwest Gas emergency number if odor-faded gas is detected or suspected and follow the instructions given by the emergency dispatch.

Do not purge the contents of a gas pipe into a confined space. (See 29 CFR 1910.146).

Consider stopping hot-work (defined in Section 16) in the area receiving the product of the purge.

Special additional precautions should be taken when purging piping systems that contain extensive branch piping, that cannot maintain appropriate purge velocities, or that are exceptionally large. For example, Southwest Gas employs special precautions when purging its pipelines that cannot maintain a purge velocity greater than 200 feet per minute or are 6 inches or larger with a volume of 200 cubic feet or more. Special precautions may include but are not limited to

- Preparing and following a written purge plan that minimizes gas mixing due to turbulence, minimizes the stratification of gases within the piping, and addresses the diffusion due to the contact duration of the gases;
- Evacuating nonessential personnel;
- Providing supplemental ventilation with appropriate equipment that discharges the air away from the enclosed space, such as a grounded air-ejector (defined in Section 16);
- Wearing flame-resistant clothing that is appropriately treated to avoid static buildup;
- Eliminating open flames and other ignition sources;
- Employing appropriate lockout-tagout safeguards to control access to piping and valves and to control access to ignition sources including electrical switches, circuit breakers, appliances, equipment, and motors;
- Purging at a controlled rate that takes into account the volume of gas or air displaced from the gas piping, the amount of ventilation present, and the volume of the enclosed premises or structure receiving the product of the purge; and

Using gas detection equipment at appropriate locations within an enclosed space where the purged gases are released and stopping the purge upon the detection of a concentration of gas.

Additional reference information

(1) National Fire Protection Association's NFPA 54, *National Fuel Gas Code* (2018); NFPA 56, *Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems* (2017); National Fire Protection Association's NFPA 70, *National Electrical Code*, Chapter 5, Special Occupancies (2017); NFPA 72, *National Fire Alarm and Signaling Code* (2010); and NFPA 77, *Recommended Practice on Static Electricity* (2019).

(2) American Gas Association's *Purging Manual* (2018) and *Gas Engineers Handbook* (1965).

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH Components	Type	Value
Butane (106-97-8)	TWA	1000 ppm
Carbon dioxide (124-38-9)	STEL	30000 ppm
	TWA	5000 ppm
Ethane (74-84-0)	TWA	1000 ppm
Methane (74-82-8)	TWA	1000 ppm
Natural Gas (8006-14-2)	TWA	1000 ppm
Pentane (109-66-0)	TWA	600 ppm
Propane (74-98-6)	TWA	1000 ppm

U.S. – OSHA Components	Type	Value	
Butane (106-97-8)	TWA	800 ppm	
		1900 mg/m3	
Carbon dioxide (124-38-9)	PEL	9000 mg/m3	
		5000 ppm	
	STEL	30000 ppm	
		54000 mg/m3	
Pentane (109-66-0)	TWA	18000 mg/m3	
		10000 ppm	
	PEL	1000 ppm	
		2950 mg/m3	
Propane (74-98-6)	STEL	2250 mg/m3	
		750 ppm	
	TWA	600 ppm	
		1800 mg/m3	
Exposure guidelines	OSHA: The acceptable max. peak above the ceiling concentration for an 8-hour shift is: 50 ppm. The acceptable duration of the peak above the ceiling concentration is: 10 minutes once, only if no other measurable exposure occurs	1800 mg/m3	
		1000 ppm	
		1000 ppm	
Engineering controls	See Section 7.	1800 mg/m3	
		1000 ppm	
Personal protective equipment	See Section 7.	1800 mg/m3	
		Eye / face protection	Wear safety glasses, goggles, or face shields around pressurized systems.
		Skin protection	Wear gloves.
		Clothing	Wear flame resistant outer garments. Wear long sleeves and long pants.
		Respiratory protection	In case of inadequate ventilation or in the case of pressurized gas displacing the air, use a supplied-air respirator.

9. Physical & Chemical Properties

Appearance	Colorless gas.
Color	Not relevant.
Odor	Sulfurous, rotten egg type odor.
Odor threshold	Readily detectable by a person with a normal sense of smell at a concentration in air of one-fifth of the lower flammability limit.
Physical state	Gas.
Form	Gas.
pH	Not relevant.
Melting point	Not available.
Freezing point	Not available.
Boiling point	-258.7 °F (-161.5 °C)
Flash point	-297.8 °F (-183.2 °C) (Methane) Cleveland Closed Cup
Evaporation rate	Not available.
Flammability	Not available.
Flammability limits in air, upper, % by volume	14 - 15
Flammability limits in air, lower, % by volume	4 - 5

Vapor pressure	Not available.
Vapor density	Not relevant.
Specific gravity	0.56 - 0.625 at 60°F (15°C)
Solubility (water)	Insoluble.
Partition coefficient (n-octanol/water)	No data available.
Auto-ignition temperature	900 - 1170 °F (482.2 - 632.2 °C)
Decomposition temperature	Not available.
Viscosity	Not relevant.

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Carbon dioxide. Carbon monoxide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Components

Test Results

Butane (106-97-8)	Acute Inhalation LC50 Rat: 658 mg/l 4 Hours
Pentane (109-66-0)	Acute Inhalation LC50 Rat: 364 mg/l 4 Hours
Propane (74-98-6)	Acute Inhalation LC50 Rat: > 1442.847 mg/l 15 Minutes
Methane (74-82-8)	Not available

Acute effects

Asphyxiants displace oxygen in the air and can cause symptoms of oxygen deprivation (asphyxiation): breathing of high vapor concentrations may cause dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness. .

Local effects

Contact with compressed gas can cause damage (frostbite) due to rapid evaporative cooling.

Sensitization

Not a skin sensitizer.

Chronic effects

No data available.

Carcinogenicity

No data available.

Mutagenicity

No data available.

Reproductive effects

No data available.

Teratogenicity

No data available.

Further information

No other specific acute or chronic health impact noted.

12. Ecological Information

Ecotoxicity	The product is a volatile organic compound which has a photochemical ozone creation potential.
Aquatic toxicity	Not expected to be harmful to aquatic organisms.
Persistence and degradability	The product is easily biodegradable.
Bioaccumulation / Accumulation	The product is not bioaccumulating.
Mobility in environmental media	The product is a volatile substance, which may spread in the atmosphere.
Partition coefficient (n-octanol/water)	No data available.

13. Disposal Considerations

Waste codes D001:	Waste Flammable material with a flash point <140 °F
Disposal instructions	<p>This safety data sheet concerns non-containerized natural gas that is delivered by pipeline from a Southwest Gas meter. See Section 16 for more information.</p> <p>Do not dispose of waste into sewer. This product, in its unaltered state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4(b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.</p>

14. Transport Information

DOT	This safety data sheet concerns non-containerized natural gas that is delivered by pipeline from a Southwest Gas meter. Re-transportation of natural gas by pipeline may be governed by 49 CFR Part 192 and applicable pipeline safety codes.
Basic shipping requirements	If this product is placed into a pressurized container and offered for shipment, refer to 49 CFR, Parts 171 to 185, for appropriate regulatory information. See Section 16.

15. Regulatory Information

US federal regulations	<p>This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.</p> <p>Some components are on the U.S. EPA TSCA Inventory List.</p>
-------------------------------	---

US TSCA Section 12(b) Export Notification: Export Notification requirement / De minimis concentration

Pentane (CAS 109-66-0)

1.0 % One-Time Export Notification only.

Natural gas reporting requirements are contained in 40 CFR Part 311, 40 CFR Part 370, and 40 CFR Part 372 for industrial users of natural gas and for government employees of hazardous waste operations. Southwest Gas has not attempted to assess the applicability of these regulations to the unique operating characteristics of the applicable employers

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	Yes
State regulations	California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) Warning: By-products of the incomplete combustion of natural gas are known to the State of California to cause cancer, birth defects or other reproductive harm.
US - California Hazardous Substances (Director's): Listed substance	
Carbon Monoxide (CAS 630-08-0)	Listed.
Formaldehyde (CAS 50-00-0)	Listed.
Soot	Listed.

16. Other Information

Containerized natural gas and LNG	This safety data sheet concerns non-containerized natural gas that is delivered by pipeline from a Southwest Gas meter. Containerized natural gas and liquefied natural gas have their own unique hazards that are not provided for in this material safety data sheet. For example, those products require substantially different and specialized engineering controls, safe handling precautions, personal protective equipment, accidental release measures, fire fighting measures, transportation requirements, and product labeling requirements.
Odorant added by Southwest Gas	This safety data sheet is for natural gas that is odorized by Southwest Gas. Some natural gas transported by Southwest Gas is already odorized from upstream distributors and may contain different odorant blends than those used by Southwest Gas. Please contact Southwest Gas for more information about the source of the natural gas for any particular location. Some downstream users may remove the odorant from the natural gas supplied by Southwest Gas, or may add similar or different odorant blends.
HMIS® ratings	Health: 1* Flammability: 4 Physical hazard: 0 (HMIS® is a registered trade and service mark of the NPCA.)
NFPA ratings	Health: 1 Flammability: 4 Instability: 0
Definitions	
Air-ejector	A device that uses the Venturi principle to siphon air or other gases. Compressed air or pressurized inert gas is introduced to allow the pressure at the throat to drop below atmospheric pressure, allowing air or other gases at atmospheric pressure to flow into the throat.
Fire-watch	The assignment of a person or persons to an area for the express purpose of notifying the fire department, the building occupants, or both of an emergency; preventing a fire from occurring; extinguishing small fires; or protecting the public from fire or life safety dangers.
Hot-work	Work or operations capable of providing a source of ignition. Includes, but is not limited to: burning, heating, thermal spraying, thawing pipe, torch-applied roofing, or other work involving open flames; sparking of electrical equipment; and cutting, welding, grinding, riveting, buffing, drilling, blasting, chipping, scraping, sawing, brazing, soldering, or other similar operations that create hot metal, sparks, or hot surfaces from friction or impact.
Retrieval-system	Combinations of rescue equipment used for nonentry (external) rescue of persons from hazardous environments or confined spaces.

Disclaimer

This product has not been tested by Southwest Gas to determine its specific health hazards. Therefore, the information in this safety data sheet may be incomplete. The information includes health hazard information on the product components that was drawn from external sources. All information is provided without warranty, express or implied. The information is believed to be correct: if errors are discovered, please promptly report them to Southwest Gas. All information contained in this safety data sheet is provided to allow the user to make an independent determination of the methods required to safeguard workers, the public and the environment. This document is not intended to convey legal advice: users should consult all applicable building and construction codes, occupational and process safety codes, environmental regulations, and all other applicable ordinances, rules, codes, regulations, statutes or other law that may include different or more stringent provisions. No effort is made to identify any transportation, environmental, or other regulatory requirements beyond the states of Arizona, California, and Nevada.

Notice of future revisions

Notices of revision to this safety data sheet will be provided in customer bill inserts and in messages on the front of the customer bill. Request a current version of this safety data sheet by contacting Southwest Gas (Section 1) or by visiting www.swgas.com.

Original issue date

02-26-2010

History of revisions

The prior version was dated 03-17-2010.