Ovintiv Safety Data Sheet (U.S.)

Natural Gas, Sour

1.0 Identification

GHS product identifier: natural gas, sour	**Version #:** 03
Synonyms: sour gas	**Issue date:** 01/01/20
CAS #: mixture	
Recommended use: Product produced at Ovintiv well sites for sale.	
Recommended restrictions: Use in accordance with this SDS.	
Manufacturer: Ovintiv USA Inc., 370 17th Street, Suite 1700, Denver, CO 80202	
Emergency phone #: 800-262-8200 or 911	**Email:** myEHS@ovintiv.com

2.0 Hazard Identification

2.1 GHS Classification and Label Elements

Signal Word: Danger			
Type of Hazard		**Category**	**Hazard Symbol**
Physical hazards	Flammable gases Compressed gas	1 N/A	
Health hazards	Acute toxicity, inhalation Simple asphyxiant	2 1	
Environmental hazards	None	None	None

2.2 Hazard Statement

- Extremely flammable gas.
- Contains gas under pressure; may explode if heated.
- Poisonous by inhalation.
- May displace oxygen and cause rapid suffocation.

2.3 Precautionary Statement

- Prevention
  - Keep away from heat/sparks/open flames/hot surfaces.
  - No smoking.
- Response

- Leaking gas fire: Do not extinguish unless leak can be stopped safely.
- Eliminate all ignition sources if safe to do so.

- Storage
  - Protect from sunlight.
  - Store in a well-ventilated place.
- Disposal
  - Dispose of waste and residues in accordance with local authority requirements.
- Hazards not otherwise classified
  - None

3.0 Composition/Information on Ingredients

Components	CAS #	Percent (Weight)
Methane	74-82-8	55-95
Ethane	74-84-0	<20
Propane	74-98-6	<10
Butane	106-97-8	<3.5
Isobutane	75-28-5	<2
2-Methylbutane	78-78-4	<1.5
Ethyl mercaptan	75-08-1	<0.01
Hydrogen sulfide (H_2S)	7783-06-4	<0.01

4.0 First Aid Measures

4.1 First Aid Procedures

- Inhalation:
  - Move 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.
  - If there is any suspicion of inhalation of H_2S:
    - Rescuers must wear breathing apparatus and follow rescue procedures.

        - Move victim to fresh air as quickly as possible.
        - Immediately begin artificial respiration if breathing has ceased.
        - Provision of oxygen may help.
- Skin contact:
    - Frostbite
        - Do not remove clothes, but flush with copious amounts of lukewarm water.
        - Call an ambulance and continue to flush during transportation to hospital.
- Eye contact:
    - Frostbite
        - Immediately and briefly flush with lukewarm, gently flowing water.
        - Cover both eyes with a sterile dressing.
        - Immediately obtain medical attention.
- Ingestion:
    - This material is a gas at normal atmosphere conditions; ingestion is unlikely.

4.2 Most Important Symptoms (Effects Acute and Delayed)

- Narcosis
- Respiratory arrest
- Behavioral changes
- Decrease in motor function

4.3 Indication of Immediate Medical Attention and Special Treatment

- Inhalation overexposure can produce toxic effects.
- Monitor for respiratory distress.
- If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis.
- Administer supplemental oxygen with assisted ventilation, as required.

4.4 Notes to Physician

- This material (or a component) may sensitize 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.

4.5 General Information

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5.0 Fire-Fighting Measures

5.1 Flammable Properties

- Extremely flammable gas.
- Contains gas under pressure; may explode if heated or under fire.
- See Sections 9.0 Physical and Chemical Properties and 10.0 Stability and Reactivity for physical/chemical and stability/reactive properties.
- NFPA: health 4, flammability 4, instability: 0.

Extinguishing Media

Suitable	Do Not Use
• Carbon dioxide (CO_2) • Dry powder • Water fog	• None

Protection of Fire-Fighters

Specific Hazards Arising from Product	Protective Equipment and Precautions
• During fire, gases hazardous to health may be formed.	• Fire-fighters should wear appropriate protective equipment and a self-contained breathing apparatus (SCBA) with full-face piece operated in positive pressure mode if fighting fire in poorly ventilated area. • Use approved gas detectors. • Gas cylinders and pressure vessels can burst violently when heated, due to excess pressure build-up.

5.2 Fire-Fighting Equipment/Instructions

- In the event of a fire or explosion, do not breathe fumes, evacuate area, and check oxygen content before entering area.
- 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.
- Remove pressurized gas cylinders from the immediate vicinity.
- Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.

- Stop leak if you can do so without risk.
- Fight fire from a safe distance.
- Water spray should be used to cool gas cylinders and pressure vessels.

6.0 Accidental Release Measures

- Personal precautions:
  - Stay upwind.
  - Ventilate closed spaces before entering them.
  - Eliminate all ignition sources (smoking, flares, sparks, or flames) in area.
  - Wear suitable protective clothing, gloves, and eye/face protection (See Section 8.0 Exposure Controls/Personal Protection of this SDS).
  - Vaporization upon release–rapid expansion possible.
- Environmental precautions:
  - Stop leak if possible without any risk.
  - Basements and cellars must be evacuated.
  - Contact local authorities in case of spillage to drain/aquatic environment.
- Methods of containment:
  - Stop leak if possible without risk.
  - Prevent entry of natural gas into waterway, sewers, or confined areas.
- Methods for cleaning up:
  - Ventilate well, stop flow of gas if possible.
  - Remove ignition sources.
  - Do not enter confined spaces, such as sewers, due to explosion risk.

7.0 Handling and Storage

7.1 Handling

- Avoid contact with eyes, skin, and clothing.
- Avoid breathing gas.
- This material is a poisonous gas that can cause respiratory arrest and can displace oxygen necessary for breathing.

- Wear appropriate personal protective equipment.
- The product is extremely flammable.
- Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content, hydrogen sulfide (H_2S), and flammability.
- HMIS: health: 4, flammability: 4, physical hazards: 0.

7.2 Storage and incompatibilities

- May form explosive mixtures in presence of oxidizing substances (e.g., gas and dust).
- Keep in cool, well-ventilated area.
- Avoid heat, sparks, open flames, and other ignition sources.
- Ground container and transfer equipment to eliminate static electric sparks.
- Store away from incompatible materials: oxidizing agents (Section 10.0 Stability and Reactivity).
- Store cylinders of product in accordance with regulatory requirements and recognized best practices.

8.0 Exposure Controls/Personal Protection

Occupational Exposure Limits

Component	Limit Type	OSHA PEL	ACGIH TLV	NIOSH REL
Methane	TWA	None	None	None
Ethane	TWA	None	None	None
Propane	TWA	1000 ppm	None	1000 ppm
Butane	STEL TWA	None None	1000 ppm None	None 800 ppm
Isobutane	STEL TWA	None None	1000 ppm None	None 800 ppm
2-Methylbutane	TWA	None	600 ppm	None
Ethyl mercaptan	Ceiling TWA	10 ppm None	None 0.5 ppm	0.5 ppm None
Hydrogen sulfide	STEL TWA	20 ppm (C) 50 ppm (10 min max)	5 ppm 1 ppm	10 ppm (C) None

TABLE NOTES:

STEL=short-term exposure limit, PEL=permissible exposure limit, REL=recommended exposure limit, TLV=threshold limit value, TWA=time-weighted average, C=ceiling, ppm=parts per million.

8.1 Engineering Controls

- Explosion proof exhaust ventilation should be used.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended occupational exposure limits.
- Provide adequate ventilation and minimize the risk of inhalation of gas.

8.2 Personal Protective Equipment

- Eye face protection:
  - Risk of contact: Wear goggles/face shield.
- Skin protection:
  - Risk of contact: Wear cold insulating gloves. Suitable gloves can be recommended by the glove supplier.
  - Anti-static and flame-retardant protective clothing is recommended.
- Respiratory protection:
  - Use appropriate respiratory protection if ventilation is inadequate.
  - Industrial hygienists should monitor personal exposure to determine the need for a respirator.

8.3 General Hygiene

- Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, or smoking.
- Routinely wash work clothing and protective equipment to remove contaminants.
- Observe any medical surveillance requirements.

9.0 Physical and Chemical Properties

Physical state	Gas
Form	Not available
Color	Clear, colorless
Odor	Rotten egg.
Odor threshold	Not available
pH	Not available
Melting point/freezing point	-296.7°C (-182.6°F)
Initial boiling point	Not available
Flash point	<114.4°C (<238°F)
Lower explosive limit (by volume)	2%
Upper explosive limit (by volume)	15%

Vapor pressure	300-600 psi in pipeline
Vapor density	0.5-0.94
Relative density	Not available
Solubility	Not available
Partition coefficient (n-octanol/water)	1.09
Auto-ignition temperature	450°C (842°F)
Decomposition temperature	Not available
Viscosity	Not available
Dynamic viscosity temperature	499°C (930.2 °F)

10.0 Stability and Reactivity

- Reactivity: This product is stable and non-reactive under normal conditions of use, storage, and transport.
- Chemical stability: Stable at normal conditions. Heat may cause the containers to explode.
- Possibility of hazardous reactions: Hazardous polymerization does not occur.
- Conditions to avoid: Heat, sparks, and flames.
- Incompatible materials: Strong oxidizing agents.
- Hazardous decomposition products: Carbon dioxide. Carbon monoxide. May produce oxides of sulfur.

11.0 Toxicological Information

11.1 Routes of Exposure

- Ingestion: This material is a gas under normal atmospheric conditions and ingestion is unlikely.
- Inhalation: Hydrogen sulfide exceeding the exposure limit can cause acute health effects ranging from headache to respiratory arrest.
- Skin contact: Contact with compressed gas can cause damage (frostbite) due to rapid evaporative cooling.
- Eye contact: Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. Permanent eye damage or blindness could result.

11.2 Toxicological Effects

- Narcosis.
- Behavioral changes.
- Decrease in motor or central nervous system functions.

- Acute toxicity:
  - Hydrogen sulfide (H_2S), a highly toxic gas, may be present.
  - Signs and symptoms of overexposure to hydrogen sulfide include:
    - Respiratory and eye irritation.
    - Dizziness.
    - Nausea.
    - Coughing.
    - A sensation of dryness and pain in the nose.
    - Loss of consciousness.
  - Odor does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.
- Chronic effects: Prolonged or repeated exposure to high concentrations may affect the central nervous system.

11.3 Skin Corrosion/Irritation

- Contact with compressed gas may cause frostbite and tissue damage.

11.4 Serious Eye Damage/Eye Irritation

- Not classified.

11.5 Respiratory Sensitization

- Not classified.

11.6 Skin Sensitization

- Not a skin sensitizer.

11.7 Mutagenicity

- Not classified

11.8 Carcinogenicity

- Not classified.

11.9 Reproductive Toxicity

- Not classified.

11.10 Specific Target Organ Toxicity – Single Exposure

- Not classified.

11.11 Specific Target Organ Toxicity – Repeated Exposure

- Not classified.

11.12 Aspiration Hazard

- Suffocation (asphyxiant) hazard if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.

11.13 Other Effects

- Effects to components of natural gas:
    - Propane: Studies in laboratory animals indicate exposure to extremely high levels of propane (1-10 vol-% in air) may cause cardiac arrhythmias (irregular heartbeats), which can be serious or fatal.
    - Butanes: Studies in laboratory animals indicate exposure to extremely high levels of propane (1-10 vol-% in air) may cause cardiac arrhythmias (irregular heartbeats), which can be serious or fatal.
    - Pentanes: Studies in laboratory animals indicate exposure to extremely high levels of propane (1-10 vol-% in air) may cause cardiac arrhythmias (irregular heartbeats), which can be serious or fatal.
- Exposure to this material may cause adverse effects or damage to the following organ systems:
    - Central nervous system
    - Heart
    - Eyes
    - Skin

Component Toxicity

Component	LD_{50} Oral	LD_{50} Dermal	LC_{50}
Methane (74-82-8)	Not available	Not available	326,000 mg/m^3 (2-hour, inhalation, mouse)
Ethane (74-84-0)	Not available	Not available	658,000 mg/m^3 (4-hour, inhalation, rat)
Propane (74-98-6)	Not available	Not available	658,000 mg/m^3 (4-hour, inhalation, rat)
Butane (106-97-8)	Not available	Not available	658,000 mg/mg^3 (4-hour, inhalation, rat)
Isobutane (75-28-5)	Not available	Not available	570,000 ppm (15-minute, inhalation, rat)
Hydrogen sulfide (7783-06-4)	Not available	Not available	444 ppm (4-hour, inhalation, rat)
Methane (74-82-8)	Not available	Not available	326,000 mg/m^3 (2-hour, inhalation, mouse)

12.0 Ecological Information

- Ecotoxicity: Not expected to be harmful to aquatic organisms.

- Environmental effects: Not available.
- Persistence and degradability: This product is readily biodegradable.
- Bioaccumulative potential: This product is not expected to bioaccumulate.
- Mobility in soil: This product is a gas that, if spilled, preferentially volatilizes into air instead of absorbing into soil. However, the hydrogen sulfide component, albeit small, may collect in low-lying areas and sink into soil. Most of the components of sour natural gas have low mobility in soil. Isobutane and methane have a high mobility in soil.
- Water solubility: This product is a gas that, if spilled, preferentially volatilizes into air instead of dissolving in water. Most of the components of the product are alkanes and are considered insoluble in water.
- Other adverse effects: This product contains volatile organic compounds, which have the potential to create photochemical ozone.

13.0 Disposal Considerations

It is the responsibility of the user to determine if the material is considered hazardous for disposal under federal, state, and local regulations.

14.0 Transportation Information

US DOT

UN number	1971
UN proper shipping name	Natural gas, compressed with high methane content
Transport hazardous class	2.1
Packing group	Not available
Subsidiary class(es)	Not available
Labels required	2.1
Packaging exceptions	306
Packaging non-bulk	302
Packaging bulk	302
Special precautions for the user	Read safety instructions, SDS, and emergency procedures before handling.

IATA

UN number	1971
UN proper shipping name	Natural gas, compressed with high methane content
Transport hazardous class(es)	2.1
Packing group	Not available
Subsidiary class(es)	Not available
Label required	Not available
ERG code	10L
Special precautions for the user	Read safety instructions, SDS, and emergency procedures before handling.

IMDG

UN number	1971
UN proper shipping name	Natural gas, compressed with high methane content
Transport hazardous class(es)	2.1
Packing group	Not available
Subsidiary class(es)	Not available
Label required	2.1
EmS	F-D, S-U
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available.
Special precautions for the user	Read safety instructions, SDS, and emergency procedures before handling.

15.0 Regulatory Information

U.S.

OSHA	This product is a hazardous chemical, as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
TSCA	All components are on the US EPA TSCA Inventory List.
SARA Section 302	Yes.
SARA Section 304	Not listed.
SARA Section 311/312	This product contains propane and ethane, which may be subject to SARA reporting requirements.
SARA Section 313	Not regulated.
Clean Air Act	2-Methylbutane, Butane, Ethane, Isobutane, Hydrogen Sulfide, Methane, and Propane
Safe Drinking Water Act	Not regulated

International Inventories

Country or Region	Inventory Name	On Inventory (Yes/No)
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes

16.0 Other Information, Including Date of Preparation of Last Version

Issue date: 01/01/2020

Version #: 03

References: IARC Monographs. Overall Evaluation of Carcinogenicity (Volumes 1-102) IUCLID. Hazardous Substances Data Bank.

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.