Safety Data Sheet

1. Identification

Product Name:	Acid Gas
Synonyms:	Hydrogen sulfide, stink damp, H_2S
Chemical Family:	Toxic Gas/Flammable Gas
Manufacturers Name:	Whiting Oil and Gas Corporation
Address:	1700 Broadway, Suite 2300 Denver, Colorado 80290
Product Use:	Byproduct of petroleum processing
Phone Number for Information:	(303) 837-1661
Emergency Phone Number:	(800) 424-9300 (Chemtrec)

2. Hazard Identification

Acid gas is a colorless gas generally maintained under pressure having no odor to a strong rotten egg odor. It is extremely flammable and explosive. Keep away from heat, sparks, and open flame. Low concentrations of this gas (e.g. less than 100 parts per million (ppm)) cause respiratory irritation. Concentrations of greater than 1,000 ppm will cause immediate unconsciousness and death through respiratory paralysis. Odor is not a reliable indicator of the presence of hydrogen sulfide (H_2S) gas. Sense of smell is rapidly overwhelmed as hydrogen sulfide concentrations increase; do not rely on smell to indicate the presence of acid gas.

DANGER!
EXTREMELY FLAMMABLE AND EXTREMELY TOXIC

GAS UNDER PRESSURE.
HYDROGEN SULFIDE (H_2S) GAS CAN CAUSE RESPIRATORY
IRRITATION AND ASPHYXIATION. CAN BE CORROSIVE TO METALS AND SKIN.

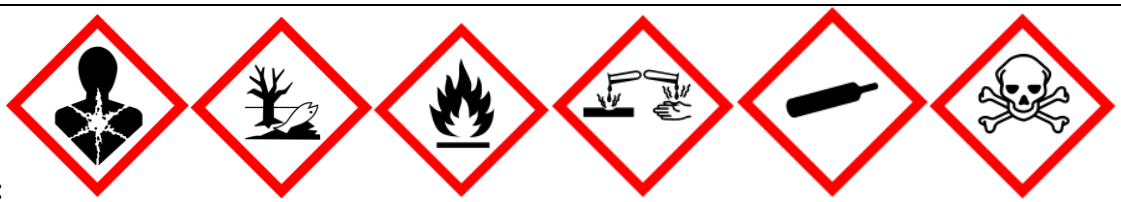
NO SMOKING!
KEEP AWAY FROM HEAT/SPARKS/OPEN FLAMES/HOT SURFACES.
DO NOT BREATHE GAS. WEAR RESPIRATORY PROTECTION, PROTECTIVE GLOVES, CLOTHING AND EYE WEAR WHEN HANDLING. AVOID RELEASE INTO THE ENVIRONMENT.

Globally Harmonized System (GHS) Information

Physical Hazards Classification
Flammable Gas, Category 1
Gas Under Pressure, Liquefied gas

Health Hazards Classification
Acute Toxicity, Category 2
Serious eye damage/eye irritation, Category 2a
Specific Target organ toxicity, Category 1 (central nervous system, cardiovascular system, respiratory system)

Environmental Hazards Classification
Acute Toxicity to the aquatic environment, Category 1
Chronic Toxicity to the aquatic environment, Category 1

<table>
<tr><th colspan="2">GHS Label Information</th></tr>
<tr><td colspan="2">Symbols:  </td></tr>
<tr><td colspan="2">Signal Word: Danger</td></tr>
<tr><td>Hazard Statements:</td><td>Precautionary Statements:</td></tr>
<tr><td>Physical Hazards
Extremely flammable gas
Contains gas under pressure, may explode if heated

Health Hazards
Fatal if inhaled
Causes serious eye irritation
Causes damage to central nervous system, cardiovascular system, respiratory system

Environmental Hazards
Very toxic to aquatic life
Very toxic to aquatic life with long lasting effects</td><td>Prevention
Keep away from heat/sparks/open flames/hot surfaces
Do not breathe gas
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
Avoid release to the environment
Wear protective gloves/protective clothing/face protection
Wear respiratory protection
Response
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call for assistance
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call for assistance.
Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate ignition sources if safe to do so
Storage
Store locked up
Protect from sunlight. Store in a well-ventilated place
Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations</td></tr>
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3. Composition/Information on Ingredients

CHEMICAL NAME	CAS NUMBER	PERCENT
Hydrogen Sulfide	7783-06-4	40-95%
Natural Gas	8006-14-2	5-60% (contains constituents below)
Methane	8002-05-9	varies
Ethane	74-84-0	varies
Nitrogen	7727-37-9	varies
Carbon Dioxide	124-38-9	varies

4. First Aid Measures

Eye Contact
Immediately flush eyes, while holding eyelids open, with large amounts of clean, low-pressure tepid water for at least 15 minutes. If symptoms, irritation or injury persists, worsen or develop, seek medical attention.

Skin Contact
Flush with large amounts of water. If symptoms or irritation occur, seek medical attention.

Inhalation
Remove victim to fresh air and provide oxygen if breathing labored, shallow, or difficult. Rescuer must wear appropriate supplied air respirator to remove worker from contaminated area to fresh air. Give artificial respiration if victim is not breathing. Seek medical attention immediately.

Ingestion
Not applicable

Aggravated Medical Conditions
Asthma, emphysema, cold or other respiratory deficiencies. Heart disease, eye infections, anemia, psychiatric problems. Consumption of alcohol may increase exposure effects.

5. Fire-Fighting Measures

Extinguishing Media
For small fires, class B fire extinguishing media such as carbon dioxide or dry chemical can be used. Water spray, fog, and/or foam is recommended for larger fires.

Special Fire Fighting Procedures and Precautions
Stop flow of gas before extinguishing fire as explosive reignition or chemical exposure can occur. Use water to cool containers and exposed area. Stay upwind and out of low areas. Approach with caution as gas may burn with nearly invisible flame.

Unusual Fire Explosion Hazards
None

NFPA Ratings
Health – 4
Flammability – 4
Reactivity – 0
Other – 0

Key: Least-0; Slight-1; Moderate-2; High-3; Extreme-4

6. Accidental Release Measures

Hold your breath and don't panic. Evacuate the area and keep people upwind and uphill. Don self contained breathing apparatus (SCBA) or escape pack if quicker than evacuation. Keep the public away. Isolate and evacuate the area. Stop leak if safe to do so and eliminate all ignition sources. Allow gas to dissipate and ventilate closed and low lying areas to reduce the danger of explosion or exposure. Wear appropriate supplied-air respirator and protective clothing.

Use personal H_2S gas monitors if in a suspected hydrogen sulfide area. Do not attempt rescue unless you are outfitted with supplied air (SCBA or air line unit). Gas collects in low spots and confined spaces. Higher concentrations of H_2S can accumulate when there is little or no wind.

7. Handling and Storage

Comply with all regulatory requirements. Store in suitable tanks or closed, labeled containers in a cool, well-ventilated area.

Keep away from heat, sparks or flame. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all gas is gone. Containers, even those that have been emptied, can contain explosive vapors. Do not puncture, cut, drill, grind, weld or perform similar operations on or near containers.

Hydrogen Sulfide is very corrosive to all electro-chemical series metals and can cause hydrogen embrittlement, blistering and pitting in steel pipe. Corrosion caused by H_2S can lead to an unexpected and unintentional release. Metal components used with H_2S service should be resistant to sulfide stress cracking (see API and/or NACE requirements). Where hydrogen sulfide is regularly present, install continuous monitoring equipment or systems with alarms. Train workers in hazards associated with hydrogen sulfide and emergency situations.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits

COMPONENT	OSHA PEL	ACGIH TLV TWA
Hydrogen Sulfide	20 ppm ceiling	1 ppm/STEL 5 ppm IDLH 100 ppm
Natural Gas	Not available	Not available
Methane	Not available	1000 ppm*
Ethane	Not available	1000 ppm*
Nitrogen	Not available	simple asphyxiant
Carbon Dioxide	5000 ppm	5000 ppm/STEL 30000 ppm

Notes:
* Aliphatic Hydrocarbon Gas (Alkane C1-C4)

Engineering Controls

Maintain air concentrations below flammable limits and occupational exposure standards for hydrogen sulfide by using ventilation and other engineering controls.

Personal Protective Equipment

Eye/Face Protection
Goggles or safety glasses should be used when handling compressed gasses.

Skin Protection
Use butyl rubber, nitrile or neoprene gloves. Flame Resistant Clothing (FRC) is required when potential for a flash fire exists.

Respiratory Protection
Do not enter storage compartments or hydrogen sulfide areas (> 10 PPM) unless equipped with a H_2S monitor and a NIOSH approved supplied air apparatus (SCBA or air line unit) with a full face-piece operated in a positive pressure mode.

9. Physical and Chemical Properties

Appearance and Odor: Colorless gas with rotten egg odor at low concentrations. Note: that hydrogen sulfide causes olfactory fatigue or loss of smell at concentrations of around 30 parts per million or higher).

pH:	not applicable
Melting Point/freezing point:	- 85° C; - 121° F (hydrogen sulfide)
Boiling Point:	-60° C; -76° F (hydrogen sulfide)
Flash Point and Method:	Flashpoint (°C): -82.4
Evaporation Rate:	not applicable
Flammable Limits:	(approximate % Volume in air) LEL = 4%, UEL = 45%
Vapor Pressure:	13,127 mmHg (252 psi) @ 70° F (hydrogen sulfide)
Specific Gravity:	not available
Vapor Density	1.19 (Air=1)
Solubility:	Forms sulfuric acid when dissolved in water

Partition coefficient (n-octanol/water): not applicable

Auto ignition temperature	500° F
Decomposition temperature	not available
Viscosity	not applicable

10. Stability and Reactivity

Stability: Stable
Hazardous polymerization: Will not occur

Conditions and Materials to Avoid: Avoid contact with strong oxidizers, diazonium compounds and metal oxides including rusty iron.
Hazardous Decomposition Products: Thermal decomposition products are highly dependent on the combustion conditions. Carbon monoxide (CO), sulfur dioxide (SO_2) and other unidentified organic compounds may be formed upon combustion.

11. Toxicological Information

Acute toxicity - Hydrogen sulfide is a highly toxic gas. Hydrogen sulfide is a chemical asphyxiant. It may be quickly fatal if inhaled – exposure may results in bronchial spasm, inflammation, and edema. Exposure also may result in chemical pneumonitis and pulmonary edema - fluid in lungs. Concentrations approximating 1,000 ppm will cause unconsciousness and death in a short period of time.

Symptoms of exposure include: burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. At high concentration can cause rapid loss of consciousness.

Skin corrosion/irritation - Generally not a skin irritant except in high concentrations; however, hydrogen sulfide can be absorbed through the skin and produce toxic effects.

Eye damage/irritation – Hydrogen sulfide gas can cause eye irritation leading to light sensitivity. Hydrogen sulfide may cause burning or tearing and visual disturbances at repeated exposures above the TLV. Pressurized gas can cause mechanical injury to the eye.

Sensitization - Not known to cause respiratory or skin sensitization

Germ cell mutagenicity – Information not available

Carcinogenicity – Not a known or suspected carcinogen

Reproductive toxicity – Not a known reproductive toxin

Specific Target Organs/Systemic Toxicity – Lungs, eyes, nervous system

Aspiration hazard – Not applicable

12. Ecological Information

None identified – Acid gas will dissipate in air.

13. Disposal Considerations

This product as produced is not specifically listed as an EPA RCRA hazardous waste according to 40 CFR 261. However, when disposed of, it may meet the criteria of a "characteristic" hazardous waste. It is the responsibility of the user to determine if the material is considered hazardous for disposal under federal, state and local regulations.

14. Transportation Information

Department of Transportation Classification: Toxic Gas
D.O.T. proper shipping name: Hydrogen Sulfide, Compressed
Other Requirements: UN 1053
Hazard Class: 2.3
Packing Group not applicable

15. Regulatory Information

TSCA Hydrogen sulfide (H_2S) is listed on the TSCA chemical inventory.

SARA Section 302 This product contains hydrogen sulfide (H_2S) which has been listed on the EPA's extremely hazardous substance list.

SARA Section 304 This product contains the following component(s) which in the event of a spill may be subject to SARA reporting requirements: hydrogen sulfide (H_2S).

SARA Section 311/312 The following hazard categories apply to this product:
Acute health hazard
Fire hazard
Sudden release of pressure

SARA Section 313 This product contains hydrogen sulfide (H_2S) which may be subject to reporting on a toxic release inventory.

16. Other Information

Date Prepared: August 29, 2008
Revised: October 30, 2013
Last Reviewed: October 30, 2013

Disclaimer:

The information and recommendations contained in this SDS are believed to be accurate at the date of its preparation. Whiting Oil and Gas Corporation makes no representations or warranties, express or implied, with respect to the accuracy or completeness of the information contained herein. Whiting Oil and Gas Corporation assumes no responsibility for incorrect handling or use of the product or the inherent hazards in the product itself.