



Condensate Sour

Material Safety Data Sheet

1. Product and Company Identification

Product Name: Condensate, Sour
Synonym: Condensate
Product use: Refinery feedstock
Manufacturer: ARC Resources Ltd.
Address: Suite 2100, 440 2nd Street SW
Calgary, AB, T2P 5E9
Emergency Contact: 403-292-0434
Canutec: (613) 996-6666 or Cellular *666

2. Hazards Identification

EMERGENCY OVERVIEW

This product is **highly flammable!** Contains hydrogen sulphide that is an extremely toxic and flammable gas at low concentrations. Exposures to hydrogen sulphide above 100 ppm are immediately dangerous to life and health (IDLH) and may be fatal. Exposures to hydrogen sulphide between 10 ppm and 100 ppm may produce irritation to the respiratory tract. May contain benzene, a proven human carcinogen. May contain toluene a reproductive hazard. Vapors are heavier than air and may travel considerable distances to a source of ignition and flash back. Vapors may spread along the ground and may enter sewers, basements and other confined spaces.

POTENTIAL HEALTH EFFECTS/ROUTES OF EXPOSURE

Eye: This product is a moderate eye irritant and chronic exposure may cause hemorrhage of the eye.

Skin: This product is a moderate irritant of the skin and repeated or prolonged contact may defat the skin and lead to dermatitis or even skin cancer.

Ingestion: If ingested, abdominal cramping, vomiting and diarrhea may occur. Aspiration of liquid into the lungs may cause chemical pneumonia, severe lung damage and respiratory failure.

Inhalation: Inhalation may cause irritation of nose, mouth and throat, headaches, loss of appetite, drowsiness, nausea and vomiting, loss of consciousness and even death. Potential effects target the Central Nervous System, liver and kidneys. The benzene component is a known human carcinogen that may result in aplastic anemia and leukemia (cancer of the bone marrow). Aspiration risk is high! Aspiration may cause chemical pneumonia, severe lung damage and/or respiratory failure.

3. Composition/Information on Ingredients

Ingredient Name	%	CAS No.
Natural gas condensates	100	68919-39-1
Methane	1-11	74-82-8
Ethane	1-13	74-84-0
Propane	1-27	74-98-6
iso-Butane	1-9	106-97-8



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n-Butane	1-19	75-28-5
iso-Pentane	2-8	78-78-4
n-Pentane	2-23	109-66-0
Cyclopentane	<1	287-92-3
Methylcyclopentane	1-6	96-37-7
n-Hexane	3-20	110-54-3
Cyclohexane	1-4	110-82-7
Methylcyclohexane	1-6	108-87-2
Heptane	1-15	142-82-5
Octane	1-17	111-65-9
Benzene	0.1-1	71-43-2
Toluene	0.1-4	108-88-3
Ethylbenzene	0.1-1	100-41-4
Xylene	1-5	1330-20-7
1, 2, 4 Trimethylbenzene	0-1	25551-13-7
Hydrogen Sulphide	1-27	7783-06-4

Condensate is a liquid hydrocarbon product associated with Natural Gas and is used as refinery feedstock for the crude or condensate units. This product is a commingled stream from multiple petroleum facilities and is a complex mixture consistent with the definition within WHMIS regulation CPR section 2. The listed components are provided as guidance based on the available knowledge of the commingled stream. Sour condensate contains dissolved hydrogen sulphide.

4. First Aid Measures

- Eyes:** In case of contact with eyes, immediately flush with clean, low-pressure water for at least 20 minutes. Hold eyelids open to ensure adequate flushing. Seek medical attention.
- Skin:** Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water (waterless hand cleanser may be used if water is not readily available). Obtain medical attention if irritation or redness develops. High-pressure injections are serious medical emergencies - seek immediate medical attention.
- Ingestion:** Do not induce vomiting because of the danger of aspiration of fluid into the lungs. Obtain immediate medical attention.
- Inhalation:** Ensure your own safety and use the appropriate respiratory protection to immediately remove the victim to an area free of contaminants. Give CPR or artificial respiration as needed and give oxygen if breathing is difficult. Keep victim at rest and get immediate medical attention.



5. Fire Fighting Measures

FLAMMABLE PROPERTIES

Flammable Liquid

HAZARDOUS COMBUSTION PRODUCTS

Upon combustion, irritating gases of incomplete combustion such as carbon monoxide, carbon dioxide and sulphur dioxide may be produced.

FIRE AND EXPLOSION HAZARDS

Product vapours are heavier than air and may travel considerable distances to sources of ignition and flash back. Vapors may spread along the ground and may enter sewers, basements and other confined spaces.

EXTINGUISHING MEDIA

Small Fires: Dry chemical, CO₂, or alcohol resistant foam.

Large Fires: Water spray, fog or alcohol resistant foam.

FIRE FIGHTING INSTRUCTIONS:

Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers. Consider initial downwind evacuation for at least 800 meters (1/2 mile). Cool containers with large quantities of water until well after the fire has been put out. Do not direct the water stream at the source of the leak or safety devices as 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. Fight fires from maximum distance and for massive fires, use unmanned hose holders or monitor nozzles. If this is not possible, withdraw from the area and let the fire burn.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

UNUSUAL FIRE & EXPLOSION HAZARDS

Product floats on water and is capable of creating a fire hazard along path of runoff. Product is extremely toxic due to the hydrogen sulphide content.

6. Accidental Release Measures

ACTIVATE EMERGENCY RESPONSE PLAN, IF AVAILABLE.

Small Spills: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Remove all ignition sources. Ventilate the area and attempt to stop the leak if possible without risk. Do not attempt to extinguish a fire unless the leak can be stopped.

Large Spills: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Isolate spill or leak area immediately for at least 50 to 100 meters (160 to 330 feet) in all directions. Keep unauthorized personnel away and stay upwind. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Keep out of low areas. Do not discharge solid water stream pattern into the liquid resulting in splashing. Do not flush down sewer or drainage systems. Protect bodies of water by diking, if possible. Place absorbent materials into closed containers or burn in approved combustion chambers. For large spills, recover liquid and remove contaminated earth.

Evacuation: Fire: If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1



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mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

Caution: Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Consideration should be given to environmental clean-up and waste material generation when deciding if the use of large volumes of water is appropriate for non-fire emergency situations. Clean-up crews must be properly trained and must utilize proper protective equipment.

7. Handling and Storage

HANDLING PRECAUTIONS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Handle as a flammable gas. Keep away from all sources of heat, sparks, open flame or any sources of ignition as well as flammable materials or oxidizers. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Use only with adequate ventilation and avoid breathing vapours. Ground and bond all lines and equipment. Use intrinsically safe electrical equipment. DO NOT siphon by mouth.

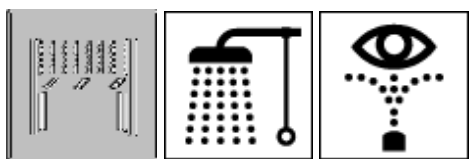
STORAGE PRECAUTIONS

Store in a cool, dry and well ventilated area out of sunlight and away from all sources of ignition. Avoid storage in low, confined locations or near incompatible materials such as other flammable materials, oxidizers or materials that support combustion.

WORK/HYGIENIC PRACTICES

An emergency eye wash station should be available in the vicinity of any potential splash exposure. Use good personal hygiene practices. Avoid skin exposure and wash hands before eating, drinking, smoking, or using toilet facilities. Do not eat, drink or smoke in areas of use or storage. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapours which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves. Work areas should be assessed for airborne benzene and hydrogen sulphide concentrations.

8. Exposure Controls / Personal Protection



ENGINEERING CONTROLS

Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece may be required. Ensure adequate ventilation to keep vapour and gas concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Ventilation system and other equipment must be intrinsically safe. Showers and/or eyewash fountains should be provided within the immediate work area for emergency use when there is any possibility of exposure to liquids.





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PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: Wear chemical goggles or a full-face shield when handling this product.

Skin Protection: Avoid skin contact. Wear fire retardant clothing and chemical resistant gloves when handling this product.

Respiratory Protection: This product is a known asphyxiant and air supplied respirators are required if there is a potential for decreased oxygen concentrations. Ensure your own safety and use the appropriate respiratory protection. An approved self-contained breathing apparatus (SCBA) with full-face piece must be worn if the concentration exceeds the OEL (Occupational Exposure Limit) of hydrogen sulphide or LELs. When assessing the proper type of respiratory protection, also consider the occupational exposure limits applicable to individual ingredients. Refer to CSA Standard "Selection, Use and Care of Respirators" (Z94.4-02) and NIOSH Respirator Decision Logic for additional guidance on respiratory protection.

Exposure Limits

Ingredient Name	CAS No.	Exposure Limits
Natural gas condensates	68919-39-1	Not applicable
Methane	74-82-8	ACGIH TLV-TWA =1000 ppm
Ethane	74-84-0	ACGIH TLV-TWA =1000 ppm
Propane	74-98-6	ACGIH TLV-TWA =1000 ppm
iso-Butane	106-97-8	ACGIH TLV-TWA =1000 ppm
n-Butane	75-28-5	ACGIH TLV-TWA =1000 ppm
iso-Pentane	78-78-4	ACGIH TLV-TWA =600 ppm
n-Pentane	109-66-0	ACGIH TLV-TWA =600 ppm
Cyclopentane	287-92-3	ACGIH TLV-TWA =600 ppm
Methylcyclopentane	96-37-7	Not applicable
n-Hexane	110-54-3	ACGIH TLV-TWA =50 ppm (skin)
Cyclohexane	110-82-7	ACGIH TLV-TWA =100 ppm
Methylcyclohexane	108-87-2	ACGIH TLV-TWA =400 ppm
Heptane	142-82-5	ACGIH TLV-TWA =400 ppm ACGIH TLV-STEL =500 ppm
Octane	111-65-9	ACGIH TLV-TWA =300 ppm
Benzene	71-43-2	ACGIH TLV-TWA =0.5ppm (skin) ACGIH TLV-STEL =2.5ppm
Toluene	108-88-3	ACGIH TLV-TWA =20 ppm
Ethylbenzene	100-41-4	ACGIH TLV-TWA =20 ppm
Xylene	1330-20-7	ACGIH TLV-TWA =100 ppm ACGIH TLV-STEL=150 ppm
1, 2, 4 Trimethylbenzene	25551-13-7	ACGIH TLV-TWA =25 ppm
Hydrogen Sulphide	7783-06-4	ACGIH TLV-TWA= 1 ppm ACGIH TLV-STEL= 5 ppm Alberta OEL 10 ppm 8 hour TWA, 15 ppm Ceiling BC EL 10 ppm Ceiling Saskatchewan 10 ppm 8 hour TWA, 15 ppm STEL



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9. Physical and Chemical Properties

Appearance and state:	Pale yellow to brown liquid
Odour:	Characteristic rotten egg odour.
Odour Threshold:	0.05 ppm (Hydrogen Sulphide)
Flash Point:	-20°C to 93.3 °C (Flash point are in the flammable range but are highly dependent condensates. This is a commingled stream of condensates from various locations.
Auto Ignition:	Not Available
Lower Explosive Limit (%):	Not Available
Upper Explosive Limit (%):	Not Available
Boiling Point:	Varies with source but >28°C
Melting Point:	Not available
Vapour Pressure:	Not available
Vapour Density (Air = 1):	>1
Viscosity:	Not available
Specific Gravity:	480 - 750 kg/m ³
Solubility (H ₂ O):	Slight
Percent Volatiles:	Not Applicable
Evaporation Rate:	Not Applicable

10. Stability and Reactivity

STABILITY

Stable

CONDITIONS TO AVOID (STABILITY)

Material is stable under normal conditions but will rapidly volatilize. Avoid high temperatures, open flames, sparks, welding, smoking and other ignitions sources.

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers, ignition sources and heat.

HAZARDOUS DECOMPOSITION PRODUCTS

Irritating or toxic substances may be emitted upon thermal decomposition. Decomposition products include carbon dioxide, carbon monoxide and sulphur dioxide.

HAZARDOUS POLYMERIZATION

Will not occur

11. Toxicological Information

Chemical Name	CAS No.	LD50	LC50
Methane	74-82-8	Not applicable	Not available
Ethane	74-84-0	Not applicable	Not available
Propane	74-98-6	Not applicable	Not available
Isobutane	106-97-8	Not available	Mouse inhalation 52 mg/kg/1 hr
n-Butane	75-28-5	Not available	Rat: 658 mg/l/4Hrs
iso-Pentane	78-78-4	Not available	Mouse: 14000 ppm
n-Pentane	109-66-0	Mouse (ivn): 446	Rat: 364 gm/m ³ (4Hr)



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		mg/kg	
Cyclopentane	287-92-3	Not available	Not available
Methylcyclopentane	96-37-7	Not available	Not available
n-Hexane	110-54-3	Rat (oral): 43.5 mg/kg BW	Mouse inhalation 48000 ppm/4 hr
Cyclohexane	110-82-7	Rat oral 8.0 mL/kg	Not available
Methylcyclohexane	108-87-2	Not available	Not available
Heptane	142-82-5	Mouse, iv 222 mg/kg	Not available
Octane	111-65-9	Not available	Rat inhalation 118 g/cu m/4 hr
Benzene	71-43-2	Rat (oral): 3306mg.kg	Rat ihl: 10,000 ppm 7hr
Toluene	108-88-3	Rat oral 5000 mg/kg	rats 8000 ppm for 4 hr.
Ethylbenzene	100-41-4	Rat oral 3500 mg/kg	Not available
Xylene	1330-20-7	LD50 Rat oral 4.3 g/kg	Not available
1, 2, 4 Trimethylbenzene	25551-13-7	Rat, oral 8970 mg/kg	Not available
Hydrogen Sulfide	7783-06-4	Not applicable	Rat inhalation 380 mg/ cu m > 960 min

POTENTIAL HEALTH EFFECTS

Acute effects: Effects vary with concentration of hydrogen sulphide and may include mild eye, nose and throat irritation at 100 ppm to sudden unconsciousness and even death at approximately 500 ppm. Memory loss, nausea and vomiting, paralysis of facial muscles or nerve tissue damage may occur after exposures up to 500 ppm. At a concentration of 150 ppm Hydrogen Sulfide, the olfactory nerve is paralyzed. At relatively low concentrations, this product is a simple asphyxiant and may displace oxygen primarily when present in enclosed spaces resulting in chronic hypoxia including effects such as decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision and headache. Low concentrations may also irritate eyes, skin, respiratory system, central nervous system, and peripheral nervous system. May cause irritation of nose, mouth and throat, CNS depression, cardiac sensitization, drowsiness, narcosis and asphyxia.

Chronic effects: Chronic exposure to hydrogen sulphide of 50 ppm or greater may include bronchitis and inflammation of the mucous membranes of the respiratory system. At 250 ppm hydrogen sulphide, chronic effects may include bronchial pneumonia and pulmonary edema. At relatively low concentrations, this product is a simple asphyxiant and may displace oxygen primarily when present in enclosed spaces resulting in chronic hypoxia including effects such as decreased night vision, increased respiration, decreased alertness, fatigue, tunnel vision and headache. Potential chronic effects to this product include peripheric neuropathy and blurred vision. Chronic exposure has resulted in aplastic anemia, acute myoblastic leukemia, bone marrow depression, corneal vacuolization erythroleukemia and even death.

Sensitization: Propane and butane are linked with cardiac sensitization.

Mutagenicity: Benzene is a weak mutagen.



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Reproductive effects: Spontaneous abortion is possible for women exposed to pentane during pregnancy. Benzene exposure has been linked to menstrual changes, spontaneous abortion and stillbirth. Xylene and toluene are developmental toxins.

Carcinogenicity: Benzene carcinogenic listings are as follows: Known Carcinogen NTP, Known human carcinogen IARC Group 1 proven and Confirmed human carcinogen ACGIH A1. Ethylbenzene is classified as a possible carcinogen IARC 2B.

Target organs: Central nervous system (CNS), heart, blood forming systems, liver and kidneys, gastrointestinal tract and respiratory system.

12. Ecological Information

If released into soil, this product will absorb and may biodegrade in anaerobic conditions. In water, it may volatilize. Photo-oxidation products include phenol, nitrophenols, nitrobenzene, formic acid and peroxyacetyl nitrate.

13. Disposal Considerations

Maximize product recovery for reuse or recycling. Contaminated materials may be classified as a hazardous waste due to the low flash point and benzene. Empty containers can have residues that are subject to hazardous waste disposal requirements. Dispose of waste in accordance with all applicable federal, provincial, and/or local regulations.

14. Transport Information

PROPER SHIPPING NAME:	Petroleum distillate, N.O.S.
PRIMARY TDG CLASS:	3
SECONDARY TDG CLASS:	Not Applicable
TDG IDENTIFICATION NUMBER:	UN1268
PACKING GROUP:	I, II or III
ERG NUMBER	128

15. Regulatory Information

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Product Regulations), and the MSDS contains all of the information required by the CPR.



Class B2 – Flammable Liquid

Class D1A - Very Toxic Material Causing Immediate and Serious Toxic Effects

Class D2A – Materials Causing Serious and Other Toxic Effects

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

All components of this product are listed on the Canadian DSL Inventory.



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Risk Phrases: 12-23/24-26-36/37/38-51-53-45-61

Extremely flammable. Toxic by inhalation and in contact with skin. Irritating to eyes, respiratory system and skin. Very toxic by inhalation. May cause cancer. Possible risk of harm to the unborn child. Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Safety Phrases: 9-16-20/21-29-33-36/37/39-45-60

Keep away from sources of ignition - No smoking. When using do not eat, drink or smoke. Do not empty into drains. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste.

16. Other Information

Prepared for:	ARC Resources Safety Department
Preparation information:	403.503.8600
Prepared by:	Deerfoot Consulting Inc.

Disclaimer of Expressed and Implied Warranties

The information presented in the Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. However, neither Arc Resources, Deerfoot Consulting Inc nor any of their subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use.