SECTION 1 – MATERIAL IDENTIFICATION AND USE

Material Name: NATURAL GAS LIQUIDS
Use: Feedstock, fuel
WHMIS Classification: Class A; Class B, Div. 1 and Div. 2; Class D, Div. 2, Sub-div. A
Fire: 4 **Reactivity**: 0 **Health**: 2 **Inventory No**.:
TDG: **UN**: 1075 **Class:** 2.1 **Packing Group:** N.Av.
Shipping Name: LIQUEFIED PETROLEUM GASES
Manufacturer/Supplier: CENOVUS ENERGY INC.
500 Centre Street SE, PO Box 766
Calgary, AB T2P 0M5
Emergency Telephone: 1-877-458-8080, CANUTEC 1-613-996-6666 (Canada)
Chemical Family: Liquified aliphatic paraffinic hydrocarbons

SECTION 2 – HAZARDOUS INGREDIENTS OF MATERIAL

Hazardous Ingredients	Approximate Concentrations %	C.A.S. Nos.	LD50/LC50 Specify Species & Route	Exposure Limits
Butane	10 - 60	106-97-8	N.Av./inh rat 4hrs 658 g/m3	1000 ppm (OEL, TLV[1])
Butane +	80-100	N.Av.	N.Av.	N.Av.
Ethane	<5	74-84-0	N.Av.	1000 ppm (OEL, TLV[1])
Propane	<10	74-98-6	N.Av.	1000 ppm
Benzene	0.1-2	71-43-2	LD50,rat,oral,930 mg/kg LC50,rat,4 hr,13200 ppm	0.5 ppm (OEL, TLV)

[1] As Aliphatic hydrocarbon gases OEL = 8 hr. Alberta Occupational Exposure Limit

SECTION 3 – PHYSICAL DATA FOR MATERIAL

Physical State: Gas
Vapour Pressure (mmHg): >1335 @ 37.8 C
Specific Gravity: 0.62-.069
Odour Threshold (ppm): N.Av.
Vapour Density (air=1): >2
Evaporation Rate: N.Av.
Percent Volatiles, by volume: 100
Boiling Pt. (deg.C): -26
Odour & Appearance: colorless, odourless (or may have mercaptan odour)
Freezing Pt. **(deg.C**): -164
pH: N.App.
Coefficient of Water/Oil Distribution: <0.1
(N.AV. = not available N.App. = not applicable)

SECTION 4 – FIRE AND EXPLOSION

Flammability: Yes **Conditions**: Material may ignite at normal temperatures.
Means of Extinction: Foam, CO2, dry chemical. Explosive accumulations can build up in areas of poor ventilation.
Special Procedures: Use water spray to cool fire-exposed containers, and to disperse gas if leak has not ignited. If safe to do so, cut off fuel and allow flame to burn out.
Flash Point (deg.C) & Method: -50 to -135
Hazardous Combustion Products: Carbon monoxide
Upper Explosive Limit (% by vol.): 13
Sensitivity to Impact: No
Lower Explosive Limit (% by vol.): 2
Sensitivity to Static Discharge: Yes, may ignite
Auto-Ignition Temp. (deg.C): >400
TDG Flammability Classification: 2.1

SECTION 5 – REACTIVITY DATA

Chemical Stability: Yes **Conditions**: N.App.
Incompatibility: Yes **Substances**: Chlorine and other strong oxidizing agents.
Reactivity: Yes **Conditions**: Heat, strong sunlight
Hazardous Decomposition Products: Carbon dioxide, carbon monoxide

SECTION 6 – TOXICOLOGICAL PROPERTIES OF PRODUCT

Routes of Entry:
Skin Absorption: Yes **Skin Contact**: Yes (liquid) **Eye Contact**: Yes
Inhalation: **Acute**: Yes **Chronic**: Yes **Ingestion**: No
Effects of Acute Exposure: Inhalation can cause headache, disorientation, dizziness, drowsiness and possibly unconsciousness. Evidence exists that butane and propane can cause these effects at concentrations far below those required for oxygen deficiency, for example 10% LEL and above. As concentration increases, oxygen deficiency and asphyxiation may occur. Rapidly expanding gas or vaporized liquid may cause frostbite to skin and eyes.
Effects of Chronic Exposure: contains benzene and may contain n-hexane, exposure to which may increase the risk of anaemia, leukaemia and nervous system damage.
Occupational Exposure Limit: 1000 ppm (OEL for aliphatic hydrocarbons), 0.5 ppm (OEL for benzene)
Sensitization to Product: No.
Exposure Limits of Product: N.Av.
Irritancy: Yes
Synergistic Materials: None reported
Carcinogenicity: Yes **Reproductive Effects**: Possibly **Teratogenicity**: Possibly **Mutagenicity**: Possibly

SECTION 7 – PREVENTIVE MEASURES

Personal Protective Equipment: Use positive pressure self-contained breathing apparatus or supplied air breathing apparatus when entering areas where high concentrations may be present.
Gloves: Insulated gloves **Respiratory Protection**: SCBA or SABA **Eye**: Splash goggles and face shield if SCBA or SABA not worn.
Footwear: As per safety policy **Clothing**: As per fire protection policy
Engineering Controls: Use only in well ventilated areas. Mechanical ventilation recommended in confined areas. Equipment must be explosion proof.
Leaks & Spills: If safe to do so, stop gas flow. Remove all ignition sources. Provide explosion-proof clearing ventilation if possible. Prevent from entering confined spaces. Use personal protective equipment.
Waste Disposal: Controlled burning or venting in accordance with regulatory requirements.
Handling Procedures & Equipment: Avoid contact with liquid or liquid cooled equipment. Avoid inhalation. Bond and ground all transfers. Avoid sparking conditions.
Storage Requirements: Store in a cool, dry, well ventilated area away from heat, strong sunlight, and ignition sources.
Special Shipping Information: N.Av.

SECTION 8 – FIRST AID MEASURES

Skin: If freeze burn occurs, gently bathe affected area in warm water (38 – 43 deg. C). Do not rub. Get medical attention.

Eye: Immediately flush with large amounts of luke warm water for 15 minutes, lifting upper and lower lids at intervals. Seek medical attention if irritation persists.

Inhalation: Remove to fresh air. Give oxygen, artificial respiration, or CPR if needed. Seek medical attention.

Ingestion: Ingestion of liquid causes freeze burns to mouth, throat, oesophagus and lungs. Get immediate medical attention.

SECTION 9 – PREPARATION DATE OF MSDS

Prepared By: Cenovus Energy Inc. Health and Safety
Phone Number: 1-403-766-2000
Preparation Date: April 08, 2016