HALLIBURTON

SAFETY DATA SHEET

Product Trade Name: **BE-3S BACTERICIDE**

Revision Date: 05-Jun-2015 **Revision Number:** 26

1. Identification

1.1. Product Identifier

Product Trade Name: BE-3S BACTERICIDE
Synonyms: None
Chemical Family: Blend
Internal ID Code HM000119

1.2 Recommended use and restrictions on use

Application: Biocide
Uses Advised Against No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier Halliburton Energy Services Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (281) 575-5000

Prepared By Chemical Stewardship
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number

Emergency Telephone Number (281) 575-5000

2. Hazard(s) Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

Acute Oral Toxicity	Category 3 - H301
Acute Inhalation Toxicity - Vapors	Category 2 - H330
Skin Corrosion / Irritation	Category 2 - H315
Serious Eye Damage / Eye Irritation	Category 1 - H318
Skin Sensitization	Category 1 - H317
Specific Target Organ Toxicity - (Single Exposure)	Category 3 - H335
Acute Aquatic Toxicity	Category 1 - H400
Chronic Aquatic Toxicity	Category 3 - H412
Combustible dust	Combustible dust

2.2. Label Elements

Hazard Pictograms

Signal Word Danger

Hazard Statements

H301 - Toxic if swallowed
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H330 - Fatal if inhaled
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life
H412 - Harmful to aquatic life with long lasting effects

May form combustible dust concentrations in air.

Precautionary Statements

Prevention

P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves/eye protection/face protection
P285 - In case of inadequate ventilation wear respiratory protection

Response

P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P330 - Rinse mouth
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P310 - Immediately call a POISON CENTER or doctor/physician
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P362 - Take off contaminated clothing and wash before reuse
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTRE or doctor/physician
P391 - Collect spillage

Storage

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up

Disposal

P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

Contains

Substances	**CAS Number**
2,2 Dibromo-3-nitrilopropionamide	10222-01-2
2-Monobromo-3-nitrilopropionamide	1113-55-9

2.3 Hazards not otherwise classified

None known

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	60 - 100%	Acute Tox. 3 (H301) Acute Tox. 2 (H330) Skin Irrit. 2 (H315) Eye Corr. 1 (H318) Skin Sens. 1 (H317) STOT SE 3 (H335) Aquatic Acute 1 (H400)
2-Monobromo-3-nitrilopropionamide	1113-55-9	1 - 5%	Acute Tox. 3 (H301) Acute Tox. 2 (H330) Skin Irrit. 2 (H315) Eye Corr. 1 (H318) Skin Sens. 1 (H317) STOT SE 3 (H335) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First-Aid Measures

4.1. Description of first aid measures

Inhalation If inhaled, move victim to fresh air and seek medical attention.

Eyes Immediately flush eyes with large amounts of water for at least 30 minutes. Seek prompt medical attention.

Skin In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Get medical attention if irritation persists. Remove contaminated clothing and launder before reuse.

Ingestion If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person. Rinse mouth with water many times. Get immediate medical attention.

4.2 Most important symptoms/effects, acute and delayed

Causes severe eye irritation which may damage tissue. Causes skin irritation. May cause allergic skin reaction. May cause respiratory irritation. Toxic if swallowed. May be fatal if inhaled.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

5.2 Specific hazards arising from the substance or mixture

Special Exposure Hazards
Decomposition in fire may produce toxic gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

5.3 Special protective equipment and precautions for fire-fighters

Special Protective Equipment for Fire-Fighters
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid creating and breathing dust. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Evacuate all persons from the area.
See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas. Consult local authorities.

6.3. Methods and material for containment and cleaning up

Scoop up and remove.

7. Handling and storage

7.1. Precautions for Safe Handling

Handling Precautions
Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Wear appropriate respirator when opening containers. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.
Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information
Keep container closed when not in use. Store in a cool, dry location. Store in a well ventilated area. Store away from oxidizers. Store away from reducing agents. Store away from direct sunlight. Product has a shelf life of 6 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	Not applicable	Not applicable
2-Monobromo-3-nitrilopropionamide	1113-55-9	Not applicable	Not applicable

8.2 Appropriate engineering controls

Engineering Controls Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection	If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Organic vapor respirator with a dust/mist filter. (A2P2/P3)
Hand Protection	Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Nitrile gloves. (>= 0.35 mm thickness) This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.
Skin Protection	Rubber apron. Long-sleeve shirt, long pants, and shoes plus socks.
Eye Protection	Dust proof goggles.
Other Precautions	Eyewash fountains and safety showers must be easily accessible. Rubber boots

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State:	Powder	**Color:**	White to yellow
Odor:	Slight Pungent	**Odor Threshold:**	No information available

Property Remarks/ - Method	Values
pH:	4.7-4.9
Freezing Point/Range	No data available
Melting Point/Range	No data available
Boiling Point/Range	No data available
Flash Point	> 100 °C / > 212 °F Closed cup
Flammability (solid, gas)	No data available
upper flammability limit	No data available
lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	0.934 (air = 1)
Specific Gravity	2.2
Water Solubility	Partly soluble
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%)	No data available

10. Stability and Reactivity

10.1. Reactivity
Not expected to be reactive.

10.2. Chemical Stability
Stable

10.3. Possibility of Hazardous Reactions
Will Not Occur

10.4. Conditions to Avoid
Keep away from heat, sparks and flame.

10.5. Incompatible Materials
Strong oxidizers. Reducing agents.

10.6. Hazardous Decomposition Products
Oxides of nitrogen. Bromine. Hydrogen bromide. Methyl and ethyl bromide. Cyanogen bromide. Carbon monoxide and carbon dioxide.

11. Toxicological Information

11.1 Information on likely routes of exposure
Principle Route of Exposure Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics
Acute Toxicity

Inhalation Fatal if inhaled. Causes severe respiratory irritation.
Eye Contact Causes severe eye irritation which may damage tissue.
Skin Contact Causes skin irritation. May cause an allergic skin reaction.
Ingestion Toxic if swallowed.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	235 mg/kg 206.5 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	0.32 mg/L (Rat) 4h
2-Monobromo-3-nitrilopropionamide	1113-55-9	206.5 mg/kg (Rat) (similar substance)	>2000 mg/kg (Rabbit) (similar substance)	0.32 mg/L (Rat) 4h (similar substance)

Substances	CAS Number	Skin corrosion/irritation
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	Skin, rabbit: Causes moderate skin irritation.
2-Monobromo-3-nitrilopropionamide	1113-55-9	Skin, rabbit: Causes moderate skin irritation. (similar substances)

Substances	CAS Number	Eye damage/irritation
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	Eye, rabbit: Causes moderate eye irritation.
2-Monobromo-3-nitrilopropionamide	1113-55-9	Eye, rabbit: Causes severe eye irritation. (similar substances)

Substances	CAS Number	Skin Sensitization
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	Skin sensitizer in guinea pig.
2-Monobromo-3-nitrilopropionamide	1113-55-9	Skin sensitizer in guinea pig. (similar substances)

Substances	CAS Number	Respiratory Sensitization
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	No information available
2-Monobromo-3-nitrilopropionamide	1113-55-9	No information available

Substances	CAS Number	Mutagenic Effects
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	Not regarded as mutagenic.
2-Monobromo-3-nitrilopropionamide	1113-55-9	Not regarded as mutagenic. (similar substances)

Substances	CAS Number	Carcinogenic Effects
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	No information available.
2-Monobromo-3-nitrilopropionamide	1113-55-9	No information available.

Substances	CAS Number	Reproductive toxicity
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	No data of sufficient quality are available.
2-Monobromo-3-nitrilopropionamide	1113-55-9	No data of sufficient quality are available.

Substances	CAS Number	STOT - single exposure
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	May cause respiratory irritation.
2-Monobromo-3-nitrilopropionamide	1113-55-9	May cause respiratory irritation. (similar substances)

Substances	CAS Number	STOT - repeated exposure
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	No significant toxicity observed in animal studies at concentration requiring classification.
2-Monobromo-3-nitrilopropionamide	1113-55-9	No significant toxicity observed in animal studies at concentration requiring classification. (similar substances)

Substances	CAS Number	Aspiration hazard
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	Not applicable
2-Monobromo-3-nitrilopropionamide	1113-55-9	Not applicable

12. Ecological Information

12.1. Toxicity

Ecotoxicity Effects

Product Ecotoxicity Data
No data available

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	EC50 (96h) 0.3 mg/L (Selenastrum capricornutum)	LC50 2.3 mg/l (Oncorhynchus mykiss) EC50 0.72 mg/L (Mysidopsis bahia) LC50 1 mg/L (Oncorhynchus mykiss) MATC 0.47-0.98 (Oncorhynchus mykiss)	No information available	EC50 0.72 mg/L (Daphnia magna) EC50 < 0.07 mg/L (Crassostrea virginica) NOEL < 0.02 mg/L (Daphnia magna)
2-Monobromo-3-nitrilo propionamide	1113-55-9	EC50 (96h) 0.3 mg/L (Selenastrum capricornutum) (similar substance)	LC50: 2.3 mg/l (Oncorhynchus mykiss) LC50: 1 mg/L (Oncorhynchus mykiss) (similar substance) MATC: 0.47-0.98 mg/L (Oncorhynchus mykiss) (similar substance)	No information available	EC50: 0.9 mg/L (Daphnia magna) (similar substance) EC50: <0.07 mg/L (Crassostrea virginica) (similar substance) EC50: 0.72 mg/L (Mysidopsis bahia) (similar substance) NOEL: <0.02 mg/L (Daphnia magna) (similar substance)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	No information available
2-Monobromo-3-nitrilopropionamide	1113-55-9	Product is not biodegradable

12.3. Bioaccumulative potential

Substances	CAS Number	Log Pow
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	No information available
2-Monobromo-3-nitrilopropionamide	1113-55-9	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
2,2 Dibromo-3-nitrilopropionamide	10222-01-2	KOC = 65 (estimated)
2-Monobromo-3-nitrilopropionamide	1113-55-9	KOC = 65 (similar substances)

12.5 Other adverse effects
No information available

13. Disposal Considerations

13.1. Waste treatment methods
Disposal Method Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. Transport Information

US DOT
UN Number: UN2811

UN Proper Shipping Name: Toxic Solid, Organic, N.O.S. (2, 2-Dibromo-3-Nitrilopropionamide)
Transport Hazard Class(es): 6.1
Packing Group: II
Environmental Hazards: Marine Pollutant
NAERG: NAERG 154

US DOT Bulk
DOT (Bulk) Not applicable

Canadian TDG
UN Number: UN2811
UN Proper Shipping Name: Toxic Solid, Organic, N.O.S. (2, 2-Dibromo-3-Nitrilopropionamide)
Transport Hazard Class(es): 6.1
Packing Group: II
Environmental Hazards: Marine Pollutant

IMDG/IMO
UN Number: UN2811
UN Proper Shipping Name: Toxic Solid, Organic, N.O.S. (2, 2-Dibromo-3-Nitrilopropionamide)
Transport Hazard Class(es): 6.1
Packing Group: II
Environmental Hazards: Marine Pollutant
EMS: EmS F-A, S-A

IATA/ICAO
UN Number: UN2811
UN Proper Shipping Name: Toxic Solid, Organic, N.O.S. (2, 2-Dibromo-3-Nitrilopropionamide)
Transport Hazard Class(es): 6.1
Packing Group: II
Environmental Hazards: Marine Pollutant

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable
Special Precautions for User: None

15. Regulatory Information

US Regulations

US TSCA Inventory Product contains one or more components not listed on the inventory.

EPA SARA Title III Extremely Hazardous Substances Not applicable

EPA SARA (311,312) Hazard Class Acute Health Hazard

EPA SARA (313) Chemicals 2,2-Dibromo-3-nitrilopropionamide//10222-01-2

EPA CERCLA/Superfund Reportable Spill Quantity Not applicable.

EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

Federal Insecticide, Fungicide and Rodenticide Act:	Label in accordance with Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	Does not apply.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	Does not apply.

FIFRA Information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

Signal Word	DANGER CORROSIVE
Hazard Statements	Causes irreversible eye damage. May be fatal if swallowed or inhaled. Harmful if absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. This pesticide is toxic to fish.

Canadian Regulations

Canadian DSL Inventory	Product contains one or more components not listed on the inventory.

16. Other information

Preparation Information

Prepared By	Chemical Stewardship Telephone: 1-580-251-4335 e-mail: fdunexchem@halliburton.com
Revision Date:	05-Jun-2015
Reason for Revision	SDS sections updated: 2

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms
bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
h - hour
mg/m^3 - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

Key literature references and sources for data
www.ChemADVISOR.com/

Disclaimer Statement
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet