

WASTE DISPOSAL METHOD

Dispose in accordance with federal, provincial and local regulations. It is the responsibility of the end-user to determine at the time of disposal whether the product meets criteria for hazardous waste. Empty containers, which have not been cleaned and purged, contain residual hazardous material and must be disposed of, or recycled, according to local regulations.

SECTION IX: PREPARATION

THE INFORMATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH,
BUT NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

DATE ISSUED:	December 23, 2008	BY:	Product safety committee
SUPERSEDES:	January 18, 2006	PHONE:	780-440-4923

**Diversity Technologies Corp. is the parent company of
Canamara-United Supply, Hollimex Products, The Drilling Depot and
Westcoast Drilling Supplies.**

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00486

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: COD TNTPlus™, LR (3-150 MG/L)
Catalog Number: TNT821

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00486
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
PIN: 1830
Intended Use: Determination of Chemical Oxygen Demand
Date of MSDS Preparation:
Day: 22
Month: February
Year: 2010
MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Mercuric Sulfate

Percent Range: 0.1 - 1.0
Percent Range Units: weight / weight
CAS No.: 7783-35-9 Contains Mercury. Dispose Per Local, State or Federal Laws.
LD50: Oral rat LD₅₀ = 57 mg/kg; Oral mouse LD₅₀ = 25 mg/kg.
LC50: None reported
TLV: 0.05 mg/m³ (Hg)
PEL: 0.1 mg/m³ (Hg)
Ingredient WHMIS Symbol: Acute Poison

Demineralized Water

Percent Range: 15.0 - 25.0
Percent Range Units: weight / weight
CAS No.: 7732-18-5
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

Chromic Acid

Percent Range: 0.01 - 0.1
Percent Range Units: weight / weight
CAS No.: 13530-68-2
LD50: None reported
LC50: Inhalation human TCLo = 110 µg/m³

TLV: 0,05 mg/m³ (0.0235 ppm) as Cr⁺⁶
PEL: 5 µg/m³ (0.00235 ppm Cr⁺⁶), 8 Hr TWA; Action Level is 2.5 µg/m³ (0.00117 ppm), 8 Hr TWA
Ingredient WHMIS Symbol: Not applicable

Silver Sulfate

Percent Range: 0.5 - 3.0
Percent Range Units: weight / weight
CAS No.: 10294-26-5
LD50: None reported
LC50: None reported
TLV: 0.01 mg/m³ (Ag)
PEL: 0.01 mg/m³ (Ag)
Ingredient WHMIS Symbol: Not applicable

Sulfuric Acid

Percent Range: 80.0 - 90.0
Percent Range Units: weight / weight
CAS No.: 7664-93-9
LD50: Oral rat LD50 = 2140 mg/kg.
LC50: Inhalation rat LC50 = 87 ppm/4 hr
TLV: 1 mg/m³ (TWA); 3 mg/m³ (STEL)
PEL: 1 mg/m³
Ingredient WHMIS Symbol: Acute Poison Corrosive

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Turbid, light orange liquid
Physical State: Liquid
Odor: Not determined
MAY BE FATAL IF SWALLOWED CAUSES SEVERE BURNS HARMFUL IF INHALED OR ABSORBED THROUGH SKIN
CANCER HAZARD CONTAINS MATERIAL WHICH CAN CAUSE CANCER CAN CAUSE KIDNEY AND CENTRAL NERVOUS SYSTEM EFFECTS

HMIS:

Health: 3*
Flammability: 0
Reactivity: 2
Protective Equipment: X - See protective equipment, Section 8.

Potential Health Effects:

Eye Contact: Causes severe burns
Skin Contact: Causes severe burns
Skin Absorption: Will be absorbed through the skin. Effects similar to those of ingestion
Target Organs: Central nervous system Kidneys
Ingestion: Causes: severe burns May cause: abdominal pain circulatory disturbances diarrhea loosening of the teeth nausea vomiting rapid pulse and respirations toxic nephritis (inflammation of the kidneys) shock collapse kidney damage death
Target Organs: Central nervous system Kidneys
Inhalation: Toxic. Causes: severe burns May cause: difficult breathing mouth soreness teeth erosion Effects similar to those of ingestion. Inhalation of mists / sprays: Causes asthma Causes damage to the nasal epithelia Causes lung cancer
Target Organs: Central nervous system Kidneys Lungs Teeth Nasal cavity
Medical Conditions Aggravated: Pre-existing: Eye conditions Skin conditions Respiratory conditions Allergies or sensitivity to chromates or chromic acid. Allergies or sensitivity to mercury.
Chronic Effects: Chronic overexposure may cause destruction of any tissue contacted erosion of the teeth mouth soreness chronic irritation or inflammation of the lungs accumulation of silver in body tissues which causes a slate-gray

to bluish discoloration. Chromate and dichromate salts may cause ulceration and perforation of the nasal septum, severe liver damage, central nervous system effects, and lung cancer. Mercury is a general protoplasmic poison; it circulates in the blood and is stored in the liver, kidneys, spleen and bones. Main symptoms are sore mouth, tremors and psychic disturbances.

Cancer / Reproductive Toxicity Information:

An ingredient of this mixture is: IARC Group 1: Recognized Carcinogen

Hexavalent Chromium Compounds Sulfuric Acid - The IARC evaluation was based on exposure to the mist or vapor of concentrated sulfuric acid generated during chemical processes.

An ingredient of this mixture is: NTP Listed Group 1: Recognized Carcinogen

Hexavalent Chromium Compounds

Additional Cancer / Reproductive Toxicity Information: Contains: an experimental teratogen.

Toxicologically Synergistic Products: None reported

WHMIS Hazard Classification: Class D, Division 1, Subdivision A - Very toxic materials (immediate effects) Class D, Division 2, Subdivision A - Very toxic materials (other toxic effects) Class E - Corrosive material

WHMIS Symbols: Acute Poison Corrosive

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.

Ingestion (First Aid): Do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call physician immediately.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Not Flammable, but reacts with most metals to form flammable hydrogen gas. During a fire, corrosive and toxic gases may be generated by thermal decomposition.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: This material will not burn.

Fire / Explosion Hazards: Contact with metals gives off hydrogen gas which is flammable. May react violently with: strong bases water

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance. Water runoff can cause environmental damage. Dike and collect water used to fight fire.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Releases of this material may contaminate the environment. Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment. Dike the spill to contain material for later disposal.

Clean-up Technique: Mercury and its compounds are extremely toxic! Be extremely careful not to contact the spill or breathe any vapors. Absorb spilled liquid with non-reactive sorbent material. Dispose of all mercury contaminated material at an E.P.A. hazardous waste facility. Dispose of material in an E.P.A. approved hazardous waste facility. Decontaminate area with commercially available mercury absorbing compounds.

Evacuation Procedure: Evacuate general area (50 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. Deny access to unnecessary and unprotected personnel. Remain up-wind from spilled material. If conditions warrant, increase the size of the evacuation.

D.O.T. Emergency Response Guide Number: 137

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe mist or vapors. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: light contamination by organic materials (will affect product stability) heat

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product. Refer to the OSHA Standard at 29CFR1910.1026 for Cr (VI) (See Federal Register 28 February 2006 Page 10100.)

Personal Protective Equipment:

Eye Protection: chemical splash goggles

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: laboratory fume hood

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Wash thoroughly after handling. Use with adequate ventilation. Protect from: light organic materials heat Keep away from: alkalies metals other combustible materials oxidizers reducers

TLV: Not established. 0.05 mg/m³ (0.0235 ppm as Cr⁺⁶).

PEL: Not established. 5 µg/m³ (0,00235 ppm Cr⁺⁶), 8 Hr TWA; Action Level is 2,5 µg/m³ (0,00117 ppm), 8 Hr TWA

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Turbid, light orange liquid

Physical State: Liquid

Molecular Weight: Not applicable

Odor: Not determined

pH: < 0.5

Vapor Pressure: Not determined

Vapor Density (air = 1): Not determined

Boiling Point: ~ 105°C (~ 221°F)

Melting Point: Not applicable

Specific Gravity (water = 1): ~ 1.78

Evaporation Rate (water = 1): Not determined

Volatile Organic Compounds Content: Not applicable

Coefficient of Water / Oil: Not applicable

Solubility:

Water: Miscible

Acid: Not determined

Other: Not determined

Metal Corrosivity:

Steel: Corrosive

Aluminum: Corrosive

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Exposure to light or contamination by organic materials will affect this product's stability.

Reactivity / Incompatibility: May react violently in contact with: caustics

Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: mercury compounds sulfur oxides

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: Oral rat (male) LD₅₀ = 428 mg/kg; Oral rat (female) LD₅₀ = 360 mg/kg.

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: None reported

Reproductive Effects Data: None reported

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Ingredient Toxicological Data: Sulfuric Acid: Oral rat LD₅₀ = 2140 mg/kg; Mercuric Sulfate: Oral rat LD₅₀ = 57 mg/kg, Oral mouse LD₅₀ = 25 mg/kg.

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Dispose of all mercury contaminated material at an E.P.A. hazardous waste facility. Dispose of material in an E.P.A. approved hazardous waste facility.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:

Proper Shipping Name: Sulphuric Acid Solution

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Hazard Class: 8

PIN: 1830

Group: II

Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:

Canadian Inventory Status: All ingredients of this product are DSL Listed.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. Cassaret and Doull's Toxicology, 3rd Ed. New York: Macmillan Publishing Co., Inc., 1986. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Outside Testing. Sixth Annual Report on Carcinogens, 1991. U.S. Department of Health and Human Services. Rockville, MD: Technical Resources, Inc. 1991. Technical Judgment. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Verschueren, Karel. Handbook of Environmental Data on Organic Chemicals. New York: Van Nostrand Reinhold Co., 1977.

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE.
HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

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MSDS No: M00035

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: PhosVer ® 3 Phosphate Reagent
Catalog Number: 2106046

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00035

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

PIN: NA

Intended Use: Phosphate determination

Date of MSDS Preparation:

Day: 15

Month: October

Year: 2009

MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Potassium Pyrosulfate

Percent Range: 75.0 - 85.0

Percent Range Units: weight / weight

CAS No.: 7790-62-7

LD50: Oral rat LD50 = 2340 mg/kg

LC50: None reported

TLV: Not established

PEL: Not established

Ingredient WHMIS Symbol: Other Toxic Effects

Ascorbic Acid

Percent Range: 15.0 - 25.0

Percent Range Units: weight / weight

CAS No.: 50-81-7

LD50: Oral rat LD50 = 11900 mg/kg

LC50: None reported

TLV: Not established

PEL: Not established

Ingredient WHMIS Symbol: Not applicable

Sodium Molybdate

Percent Range: 1.0 - 10.0

Percent Range Units: weight / weight

CAS No.: 10102-40-6

LD50: Oral rat LD₅₀ = 4000 mg/kg.

LC50: Inhalation rat LC50 = > 2080 mg/m³/4 hrs
TLV: 5 mg/m³ (as Mo)
PEL: 5 mg/m³ (as Mo)
Ingredient WHMIS Symbol: Not applicable

Other components, each

Percent Range: 0.1 - 1.0
Percent Range Units: weight / weight
CAS No.: Not applicable
LD50: Not applicable
LC50: Not applicable
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White to off-white powder

Physical State: Solid

Odor: None

CAUSES EYE BURNS MAY CAUSE RESPIRATORY TRACT IRRITATION

HMIS:

Health: 3

Flammability: 1

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

Potential Health Effects:

Eye Contact: Causes eye burns.

Skin Contact: No effects are anticipated

Skin Absorption: None Reported

Target Organs: None Reported

Ingestion: May cause: copper deficiency anemia gout loss of appetite loss of coordination listlessness diarrhea liver damage May effect enzyme activity.

Target Organs: Blood Liver

Inhalation: May cause: respiratory tract irritation Effects similar to those of ingestion.

Target Organs: Blood Liver

Medical Conditions Aggravated: Pre-existing: Eye conditions Respiratory conditions Gout

Chronic Effects: Chronic overexposure may cause copper deficiency enzyme activity effects liver damage Molybdenum poisoning signs include loss of appetite, listlessness and reduced growth rate. Excessive exposure to molybdenum compounds may cause gout and anemia.

Cancer / Reproductive Toxicity Information:

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: Contains: an experimental mutagen.

Toxicologically Synergistic Products: None reported

WHMIS Hazard Classification: Class D, Division 2, Subdivision B - Toxic material (other toxic effects)

WHMIS Symbols: Other Toxic Effects

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Can burn in fire, releasing toxic vapors.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: Toxic fumes of: sulfur oxides. carbon monoxide, carbon dioxide. sodium monoxide

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled.

D.O.T. Emergency Response Guide Number: NONE

7. HANDLING / STORAGE

Handling: Avoid contact with eyes. Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Store between 10° and 25°C.

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes. Do not breathe: dust. Wash thoroughly after handling.

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White to off-white powder

Physical State: Solid

Molecular Weight: Not applicable

Odor: None

pH: of a 5% solution = 1.5

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: 105 °C (221 °F)
Specific Gravity (water = 1): 2.22
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: Not applicable
Coefficient of Water / Oil: Not applicable
Solubility:
 Water: Soluble
 Acid: Soluble
 Other: Not determined
Metal Corrosivity:
 Steel: Not Applicable
 Aluminum: Not Applicable

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Extreme temperatures
Reactivity / Incompatibility: Incompatible with: oxidizers dyes alkalies iron copper
Hazardous Decomposition: Heating to decomposition releases: carbon dioxide carbon monoxide sulfur oxides
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: Not corrosive to skin, no erythema

Mutation Data: None reported

Reproductive Effects Data: None reported

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Ingredient Toxicological Data: Potassium Pyrosulfate Oral rat LD50 = 2340 mg/kg; Sodium Molybdate Oral rat LD50 = 4000 mg/kg, Inhalation rat LC50 > 2080mg/m³/4 hr; Ascorbic Acid Oral rat LD50 = 11.9 g/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Work in an approved fume hood. Dilute material with excess water making a weaker than 5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:

Proper Shipping Name: Not Currently Regulated

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Hazard Class: NA

PIN: NA

Group: NA

Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:

Canadian Inventory Status: All ingredients of this product are DSL Listed.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. In-house information. Technical Judgment. Outside Testing. NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards. Cincinnati: Department of Health and Human Services, 1981. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984. Vendor Information. Patty, Frank A. Industrial Hygiene and Toxicology, 3rd Revised Edition. Volume 2. New York: A Wiley-Interscience Publication, 1981.

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NV - Not Available	v/v - volume/volume

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MSDS No: M00039

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Potassium Persulfate
Catalog Number: 2084766

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00039
Chemical Name: Peroxydisulfuric Acid, Dipotassium Salt
CAS No.: 7727-21-1
Chemical Formula: K₂S₂O₈
Chemical Family: Oxidizing Agents
PIN: 1492
Intended Use: Laboratory Reagent
Date of MSDS Preparation:
Day: 15
Month: October
Year: 2009
MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Potassium Persulfate
Percent Range: 100.0
Percent Range Units: weight / weight
CAS No.: 7727-21-1
LD50: Oral Rat LD50 = 802 mg/kg
LC50: None reported
TLV: 5 mg/m³
PEL: Not established
Ingredient WHMIS Symbol: Oxidizing Other Toxic Effects

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: White to light yellow crystals
Physical State: Solid
Odor: None
CAUSES EYE AND RESPIRATORY TRACT IRRITATION
MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTIONS
STRONG OXIDIZER: CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE

HMIS:
Health: 2
Flammability: 0
Reactivity: 0
Protective Equipment: X - See protective equipment, Section 8.

Potential Health Effects:

Eye Contact: Causes severe irritation

Skin Contact: May cause irritation May cause allergic reaction

Skin Absorption: None Reported

Target Organs: None Reported

Ingestion: May cause: gastrointestinal irritation

Target Organs: None reported

Inhalation: Causes: irritation of nose and throat May cause: allergic respiratory reaction

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Allergies or sensitivity to potassium persulfate.

Chronic Effects: Chronic overexposure may cause allergic skin reactions allergic respiratory reactions

Cancer / Reproductive Toxicity Information:

IARC Listed: No

NTP Listed: No

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

WHMIS Hazard Classification: Class D, Division 2, Subdivision B - Toxic material (other toxic effects) Class C - Oxidizing materials

WHMIS Symbols: Oxidizing Other Toxic Effects

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Strong oxidizer. Contact with combustible materials may cause a fire. During a fire, this product decomposes to form toxic gases.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: Toxic fumes of: sulfur oxides.

Fire / Explosion Hazards: May react violently with: strong reducers combustible materials

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Water.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment. Cover spilled solid material with sand or other inert material.

Clean-up Technique: Remove all combustible materials from the spill area. Cover with an inert material, such as sand. Sweep up material. Incinerate material at an E.P.A. approved hazardous waste facility. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.

D.O.T. Emergency Response Guide Number: 140

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep away from: reducers oxidizable materials Protect from: moisture heat

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Use a fume hood to avoid exposure to dust, mist or vapor.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: lab coat disposable latex gloves

Inhalation Protection: laboratory fume hood

Precautionary Measures: Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling. Keep away from: oxidizable materials reducers

TLV: 5 mg/m³

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White to light yellow crystals

Physical State: Solid

Molecular Weight: 270.32

Odor: None

pH: of 5% solution = 4.1

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not applicable

Melting Point: Decomposes at >100°C or 212°F

Specific Gravity (water = 1): 2.477

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: 0.0%

Coefficient of Water / Oil: Not determined

Solubility:

Water: Soluble

Acid: Not determined

Other: Not determined

Metal Corrosivity:

Steel: 0.704 in/yr

Aluminum: 0.137 in/yr

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Excess moisture Exposure to air. Heating to decomposition.

Reactivity / Incompatibility: May react violently in contact with: oxidizable material reducers

Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: sulfur oxides

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: Oral Rat LD50 = 802 mg/kg

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: Testing showed only slight erythema to rabbit skin.

Mutation Data: None reported

Reproductive Effects Data: None reported

--

Ingredient Toxicological Data: --
Not applicable

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
Not applicable

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Incinerate material at an E.P.A. approved hazardous waste facility.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste.
NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:
Proper Shipping Name: Potassium Persulphate
--
Hazard Class: 5.1
PIN: 1492
Group: III
Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:
Canadian Inventory Status: DSL Listed: Yes
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Technical Judgment. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. In-house information. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. CCINFO MSDS/FTSS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor).

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE.
HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

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(970) 669-3050

MSDS No: M01622

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sodium Hydroxide Solution, 1.54N
Catalog Number: 2743042

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M01622
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
PIN: 1824
Intended Use: Standard solution
Date of MSDS Preparation:
Day: 22
Month: February
Year: 2010
MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Sodium Hydroxide

Percent Range: 5.0 - 15.0
Percent Range Units: weight / volume
CAS No.: 1310-73-2
LD50: Oral rat LDLo = 500 mg/kg.
LC50: None reported
TLV: 2 mg/m³ Ceiling/STEL
PEL: 2 mg/m³
Ingredient WHMIS Symbol: Corrosive

Demineralized Water

Percent Range: > 90.0
Percent Range Units: volume / volume
CAS No.: 7732-18-5
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: Clear, colorless liquid

Physical State: Liquid
Odor: None
CAUSES SEVERE BURNS

HMIS:

Health: 3
Flammability: 0
Reactivity: 0
Protective Equipment: X - See protective equipment, Section 8.

Potential Health Effects:

Eye Contact: Causes severe burns
Skin Contact: Causes severe burns
Skin Absorption: None Reported
Target Organs: None Reported
Ingestion: Causes: severe burns vomiting rapid pulse and respirations shock collapse death
Target Organs: None reported
Inhalation: Causes: severe burns
Target Organs: None reported
Medical Conditions Aggravated: Pre-existing: Eye conditions Skin conditions Respiratory conditions
Chronic Effects: None reported
Cancer / Reproductive Toxicity Information:
This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported
Toxicologically Synergistic Products: None reported
WHMIS Hazard Classification: Class E - Corrosive material
WHMIS Symbols: Corrosive

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.
Skin Contact (First Aid): Wash skin with plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.
Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.
Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn.
Flash Point: Not applicable
Method: Not applicable
Flammability Limits:
Lower Explosion Limits: Not applicable
Upper Explosion Limits: Not applicable
Autoignition Temperature: Not applicable
Hazardous Combustion Products: This material will not burn.
Fire / Explosion Hazards: None reported
Static Discharge: None reported.
Mechanical Impact: None reported
Extinguishing Media: Use media appropriate to surrounding fire conditions
Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment.

Clean-up Technique: Cover spilled material with a dry acid, such as citric or boric. Scoop up slurry into a large beaker. Dilute with a large excess of water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a weak acid solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe mist or vapors. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: heat Keep away from: acids

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have a safety shower nearby. Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: chemical splash goggles

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Wash thoroughly after handling. Protect from: heat Keep away from: acids/acid fumes

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid

Physical State: Liquid

Molecular Weight: Not applicable

Odor: None

pH: >13

Vapor Pressure: Not determined

Vapor Density (air = 1): Not determined

Boiling Point: Not determined

Melting Point: Not applicable

Specific Gravity (water = 1): Not determined

Evaporation Rate (water = 1): Not determined

Volatile Organic Compounds Content: Not applicable

Coefficient of Water / Oil: Not applicable

Solubility:

Water: Miscible

Acid: Reacts with acid

Other: Not determined

Metal Corrosivity:

Steel: Not determined

Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Heat Evaporation Exposure to air.

Reactivity / Incompatibility: May react violently in contact with: strong acids Incompatible with: halogenated organic compounds tin aluminum zinc nitro compounds

Hazardous Decomposition: No hazardous decomposition products known.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: None reported

Reproductive Effects Data: None reported

--

Ingredient Toxicological Data: Sodium hydroxide: oral rat LDLo = 500 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:

Proper Shipping Name: Sodium Hydroxide Solution

--

Hazard Class: 8

PIN: 1824

Group: II

Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:

Canadian Inventory Status: All ingredients of this product are DSL Listed.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Technical Judgment. In-house information. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire

Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992.

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

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MSDS No: M01616

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Phosphate Acid Reagent Vials
Catalog Number: 2742900

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M01616
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
PIN: 3264
Intended Use: Standard solution
Date of MSDS Preparation:
Day: 18
Month: February
Year: 2010
MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Demineralized Water

Percent Range: 90.0 - 100.0
Percent Range Units: volume / volume
CAS No.: 7732-18-5
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

Sulfuric Acid

Percent Range: 1 - 9
Percent Range Units: weight / weight
CAS No.: 7664-93-9
LD50: Oral rat LD50 = 2140 mg/kg.
LC50: Inhalation rat LC50 = 87 ppm/4 hr
TLV: 1 mg/m³ (TWA); 3 mg/m³ (STEL)
PEL: 1 mg/m³
Ingredient WHMIS Symbol: Corrosive Other Toxic Effects

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: Clear, colorless liquid

Physical State: Liquid

Odor: None

CAUSES EYE BURNS MAY CAUSE RESPIRATORY TRACT IRRITATION

CANCER HAZARD CONTAINS SULFURIC ACID WHICH CAN CAUSE CANCER

HMIS:

Health: 4

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

Potential Health Effects:

Eye Contact: Causes eye burns.

Skin Contact: No effects are anticipated

Skin Absorption: None Reported

Target Organs: None Reported

Ingestion: Causes: irritation of the mouth and esophagus May cause: vomiting diarrhea

Target Organs: None reported

Inhalation: May cause: respiratory tract irritation teeth erosion mouth soreness difficult breathing

Target Organs: Lungs

Medical Conditions Aggravated: Pre-existing: Eye conditions Respiratory conditions

Chronic Effects: Chronic overexposure may cause erosion of the teeth chronic irritation or inflammation of the lungs cancer

Cancer / Reproductive Toxicity Information:

An ingredient of this mixture is: IARC Group 1: Recognized Carcinogen

Sulfuric Acid - The IARC evaluation was based on exposure to the mist or vapor of concentrated sulfuric acid generated during chemical processes.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

WHMIS Hazard Classification: Class E - Corrosive material Class D, Division 2, Subdivision A - Very toxic materials (other toxic effects)

WHMIS Symbols: Corrosive Other Toxic Effects

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn. During a fire, irritating and highly toxic gases may be generated by thermal decomposition.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: This material will not burn.

Fire / Explosion Hazards: This product will not burn or explode.

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment.

Clean-up Technique: Cover spilled material with an alkali, such as soda ash or sodium bicarbonate. Scoop up slurry into a large beaker. Dilute with a large excess of water. Adjust to a pH between 6 and 9. Use sulfuric or citric acid to lower pH. Use soda ash or sodium bicarbonate to increase pH. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE

Handling: Avoid contact with eyes. Do not breathe mist or vapors. Use with adequate ventilation. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Store between 10° and 25°C.

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Use general ventilation to minimize exposure to mist, vapor or dust. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: chemical splash goggles

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin. Do not breathe: mist/vapor. Use with adequate ventilation. Protect from: heat

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid

Physical State: Liquid

Molecular Weight: Not applicable

Odor: None

pH: Not determined

Vapor Pressure: Not determined

Vapor Density (air = 1): Not determined

Boiling Point: Not determined

Melting Point: Not applicable

Specific Gravity (water = 1): Not determined

Evaporation Rate (water = 1): Not determined

Volatile Organic Compounds Content: Not applicable

Coefficient of Water / Oil: Not applicable

Solubility:

Water: Soluble

Acid: Not determined

Other: Not determined

Metal Corrosivity:

Steel: Not determined

Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Extreme temperatures Heating to decomposition.
Reactivity / Incompatibility: Incompatible with: alkalies oxidizers reducers
Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: sulfur oxides
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: Skin irritation testing performed on 10% sulfuric acid showed SLIGHT to NO IRRITATION effects

Mutation Data: None reported

Reproductive Effects Data: None reported

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Ingredient Toxicological Data: Sulfuric acid: oral rat LD50 = 2140 mg/kg; inhalation rat LC50 = 87 ppm/4h

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Work in an approved fume hood. Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:

Proper Shipping Name: Corrosive Liquid, Acidic, Inorganic, N.O.S.

(< 10 % Sulphuric Acid Solution)

Hazard Class: 8

PIN: 3264

Group: III

Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:

Canadian Inventory Status: All ingredients of this product are DSL Listed.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. In-house information. Technical Judgment. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. Vendor Information. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987.

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

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(970) 669-3050

MSDS No: M00127

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Ammonia Salicylate Reagent
Catalog Number: 2395266

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00127

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

PIN: NA

Intended Use: Reagent for ammonia test

Date of MSDS Preparation:

Day: 15

Month: October

Year: 2009

MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Sodium Salicylate

Percent Range: 40.0 - 50.0

Percent Range Units: weight / weight

CAS No.: 54-21-7

LD50: Oral rat LD₅₀ = 1200 mg/kg; Oral mouse LD₅₀ = 540 mg/kg; Oral rabbit LD₅₀ = 1700 mg/kg.

LC50: None reported.

TLV: Respirable particles: 3 mg/m³; Inhalable particles: 10 mg/m³

PEL: Total dust: 15 mg/m³; Respirable fraction: 5 mg/m³

Ingredient WHMIS Symbol: Other Toxic Effects

Sodium Nitroferriocyanide

Percent Range: < 1.0

Percent Range Units: weight / weight

CAS No.: 14402-89-2

LD50: Oral rat LD₅₀ = 99 mg/kg (anhydrous).

LC50: None reported.

TLV: 5 mg/m³ as CN⁻

PEL: 5 mg/m³ as CN⁻

Ingredient WHMIS Symbol: Other Toxic Effects

Other components, each

Percent Range: 0.1 - 1.0

Percent Range Units: weight / weight

CAS No.: Not applicable

LD50: Not applicable

LC50: Not applicable
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

Sodium Citrate

Percent Range: 40.0 - 50.0
Percent Range Units: weight / weight
CAS No.: 68-04-2
LD50: Oral rat LD50 >8 g/Kg
LC50: None Reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

Sodium Tartrate

Percent Range: 10.0 - 20.0
Percent Range Units: weight / weight
CAS No.: 6106-24-7
LD50: Oral rabbit LD50 = 5290 mg/kg
LC50: None Reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Tan powder

Physical State: Solid

Odor: None

HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

CONTACT WITH ACIDS FORMS TOXIC FUMES

HMIS:

Health: 3

Flammability: 1

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: Harmful if absorbed through the skin Effects similar to those of ingestion Sodium nitroferrocyanide produces a delayed cyanide poisoning reaction.

Target Organs: Central nervous system Blood

Ingestion: Sodium nitroferrocyanide produces a delayed cyanide poisoning reaction. May cause: headache nausea vomiting central nervous system effects

Target Organs: Central nervous system Blood

Inhalation: Sodium nitroferrocyanide produces a delayed cyanide poisoning reaction. May cause: headache nausea, vomiting central nervous system effects

Target Organs: Central nervous system Blood

Medical Conditions Aggravated: Allergies or sensitivity to aspirin or salicylates.

Chronic Effects: Chronic overexposure may cause confusion diarrhea fatigue weakness death Salicylates may cause ringing in the ears (tinnitus), abnormal bleeding, gastric ulceration, mental deterioration, skin eruption, temporary vision loss, and other optical effects.

Cancer / Reproductive Toxicity Information:

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: Contains: an experimental mutagen. an experimental teratogen.

Toxicologically Synergistic Products: None reported

WHMIS Hazard Classification: Class D, Division 2, Subdivision A - Very toxic materials (other toxic effects)

WHMIS Symbols: Other Toxic Effects

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with soap and plenty of water. Remove contaminated clothing. Call physician immediately.

Ingestion (First Aid): Never give anything by mouth to an unconscious person. Call physician immediately.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, this product decomposes to form toxic gases.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined.

Hazardous Combustion Products: May emit acrid smoke and fumes.

Fire / Explosion Hazards: This product will not burn or explode.

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Dry chemical. Carbon dioxide. Alcohol foam.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Releases of this material may contaminate the environment. Stop spilled material from being released to the environment.

Clean-up Technique: Avoid contact with spilled material. Sweep up material. Dilute with a large excess of water. Flush the spilled material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Store between 10° and 25°C. Keep away from: acids / acid fumes. oxidizers

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Use a fume hood to avoid exposure to dust, mist or vapor.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: lab coat disposable latex gloves

Inhalation Protection: laboratory fume hood
Precautionary Measures: eyes skin clothing Do not breathe: dust Wash thoroughly after handling. Use with adequate ventilation. Keep away from: acids/acid fumes oxidizers
TLV: Not established.
PEL: Not established.

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Tan powder
Physical State: Solid
Molecular Weight: Not applicable
Odor: None
pH: 7.84 (5% solution)
Vapor Pressure: Not applicable
Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: 97°C (206.6°F)
Specific Gravity (water = 1): 1.689
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: None.
Coefficient of Water / Oil: Not applicable
Solubility:
 Water: Soluble.
 Acid: Soluble.
 Other: Not determined.
Metal Corrosivity:
 Steel: Not applicable
 Aluminum: Not applicable

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Heating to decomposition. Extreme temperatures
Reactivity / Incompatibility: Incompatible with: acids iodine iron salts lead acetate organic materials oxidizers silver nitrate sodium phosphate
Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: cyanide nitrogen oxides sodium oxides
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported.
 LC50: None reported.
 Dermal Toxicity Data: None reported.
 Skin and Eye Irritation Data: None reported.
 Mutation Data: None reported.
 Reproductive Effects Data: None reported.
 --
Ingredient Toxicological Data: Sodium Salicylate: Oral rat LD₅₀ = 1200 mg/kg; Sodium Citrate: Oral rat LD₅₀ > 8 g/kg; Sodium Tartrate: Oral rabbit LD₅₀ = 5290 mg/kg; Sodium Nitroferrocyanide: Oral rat LD₅₀ = 99 mg/kg.

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Flush system with plenty of water.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:

Proper Shipping Name: Not Currently Regulated

--

Hazard Class: NA

PIN: NA

Group: NA

Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:

Canadian Inventory Status: All ingredients of this product are DSL/NDSL Listed.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Technical Judgment. Sixth Annual Report on Carcinogens, 1991. U.S. Department of Health and Human Services. Rockville, MD: Technical Resources, Inc. 1991. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. In-house information. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984. Cassaret and Doull's Toxicology, 3rd Ed. New York: Macmillan Publishing Co., Inc., 1986. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor).

Legend:

NA - Not Applicable

ND - Not Determined

NV - Not Available

w/w - weight/weight

w/v - weight/volume

v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00128

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Ammonia Cyanurate Reagent
Catalog Number: 2395466

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00128
Chemical Name: Not Applicable
CAS No.: Not Applicable
Chemical Formula: Not Applicable
Chemical Family: Not applicable
PIN: 1759
Intended Use: Reagent for ammonia test
Date of MSDS Preparation:
Day: 15
Month: October
Year: 2009
MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Sodium Dichloroisocyanurate

Percent Range: 1.0 - 5.0
Percent Range Units: weight / weight
CAS No.: 2893-78-9
LD50: Oral rat LD50 = 1400 mg/kg; Oral human LDLo = 3570 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

Lithium Hydroxide, Anhydrous

Percent Range: 1.0 - 5.0
Percent Range Units: weight / weight
CAS No.: 1310-65-2
LD50: Oral rat LD50 = 225 mg/kg
LC50: Inhalation rat LC50 = 980 mg/m³/4H
TLV: 3mg/m³ Respirable Particles; 10 mg/m³ Inhalable particles
PEL: 5 mg/m³ Respirable Fraction; 15 mg/m³ Total Dust
Ingredient WHMIS Symbol: Corrosive

Sodium Citrate

Percent Range: 80.0 - 90.0
Percent Range Units: weight / weight
CAS No.: 68-04-2
LD50: Oral rat LD50 >8 g/Kg

LC50: None Reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

Sodium Tartrate

Percent Range: 5.0 - 15.0
Percent Range Units: weight / weight
CAS No.: 6106-24-7
LD50: Oral rabbit LD50 = 5290 mg/kg
LC50: None Reported
TLV: Not established
PEL: Not established
Ingredient WHMIS Symbol: Not applicable

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White powder
Physical State: Solid
Odor: Chlorine
CAUSES BURNS HARMFUL IF SWALLOWED
MAY CAUSE KIDNEY OR LIVER DAMAGE BASED ON ANIMAL DATA

HMIS:

Health: 3
Flammability: 1
Reactivity: 1
Protective Equipment: X - See protective equipment, Section 8.

Potential Health Effects:

Eye Contact: Causes eye burns.
Skin Contact: Causes burns.
Skin Absorption: None Reported
Target Organs: None Reported
Ingestion: Causes: burns May cause: dizziness nausea kidney damage liver damage
Target Organs: Liver Kidneys Central nervous system Bone marrow
Inhalation: Causes: burns May cause: shortness of breath coughing
Target Organs: None reported
Medical Conditions Aggravated: Pre-existing: Eye conditions Skin conditions Respiratory conditions
Chronic Effects: Lithium compounds have been implicated in development of aplastic anemia. Signs of lithium poisoning include dehydration, extreme weight loss, fine tremor of hands, nausea, vomiting and diarrhea, Chronic overexposure may cause central nervous system effects kidney damage liver damage
Cancer / Reproductive Toxicity Information:
This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

WHMIS Hazard Classification: Class E - Corrosive material Class D, Division 2, Subdivision B - Toxic material (other toxic effects)

WHMIS Symbols: Corrosive Other Toxic Effects

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with soap and plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, irritating and highly toxic gases may be generated by thermal decomposition.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: May emit toxic and corrosive fumes.

Fire / Explosion Hazards: Not combustible.

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Dry chemical. Carbon dioxide. Water.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Cover spilled solid material with sand or other inert material. Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: heat moisture Store away from: acids / acid fumes.

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: dust Wash thoroughly after handling. Keep away from: acids/acid fumes metals

TLV: 3mg/m³ Respirable Particles; 10 mg/m³ Inhalable particles

PEL: 5 mg/m³ Respirable Fraction; 15 mg/m³ Total Dust

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White powder

Physical State: Solid

Molecular Weight: Not applicable
Odor: Chlorine
pH: of a 5% solution = 12.33
Vapor Pressure: Not applicable
Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: >240 °C, >464 °F
Specific Gravity (water = 1): 1.783
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: None reported
Coefficient of Water / Oil: Not applicable
Solubility:
 Water: Soluble
 Acid: Soluble
 Other: Not determined
Metal Corrosivity:
 Steel: 0.00 in/yr
 Aluminum: 0.803 in/yr

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Heating to decomposition. Extreme temperatures Excess moisture
Reactivity / Incompatibility: Incompatible with: acids
Hazardous Decomposition: Contact with acids releases toxic and/or corrosive fumes of: chlorides nitrogen oxides
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None Reported
 LC50: None Reported
 Dermal Toxicity Data: None Reported
 Skin and Eye Irritation Data: None Reported
 Mutation Data: None Reported
 Reproductive Effects Data: None Reported

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Ingredient Toxicological Data: Sodium Citrate Oral rat LD50 > 8 g/kg; Sodium Tartrate Oral rabbit LD50 = 5290 mg/kg;
Lithium Hydroxide Oral rat LD50 = 225 mg/kg; Sodium Dichloroisocyanurate Oral rat LD50 = 1400 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Flush system with plenty of water.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.
NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:

Proper Shipping Name: Corrosive Solid, N.O.S.
(Lithium Hydroxide Mixture)

Hazard Class: 8

PIN: 1759

Group: II

Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:

Canadian Inventory Status: All ingredients of this product are DSL Listed.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: NIOSH Registry of Toxic Effects of Chemical Substances, 1985-86. Cincinnati: U.S. Department of Health and Human Services, April, 1987. Patty, Frank A. Industrial Hygiene and Toxicology, 3rd Revised Edition. Volume 2. New York: A Wiley-Interscience Publication, 1981. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984. Technical Judgment. In-house information. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992.

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

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(970) 669-3050

MSDS No: M01553

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: AmVer™ High Range Ammonia Test 'N Tube™ Reagent
Catalog Number: 2607000

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M01553

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

PIN: NA

Intended Use: Determination of ammonium nitrogen

Date of MSDS Preparation:

Day: 10

Month: March

Year: 2010

MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

2. COMPOSITION / INFORMATION ON INGREDIENTS

Demineralized Water

Percent Range: > 99.0

Percent Range Units: volume / volume

CAS No.: 7732-18-5

LD50: None reported

LC50: None reported

TLV: Not established

PEL: Not established

Ingredient WHMIS Symbol: Not applicable

Other components, each

Percent Range: < 1.0

Percent Range Units: weight / volume

CAS No.: Not applicable

LD50: Not applicable

LC50: Not applicable

TLV: Not established

PEL: Not established

Ingredient WHMIS Symbol: Not applicable

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Colorless liquid

Physical State: Liquid
Odor: None

HMIS:

Health: 0

Flammability: 0

Reactivity: 0

Protective Equipment: Not applicable

Potential Health Effects:

Eye Contact: No effects are anticipated

Skin Contact: No effects are anticipated

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: No Effects Anticipated

Target Organs: Not applicable

Inhalation: No effects anticipated

Target Organs: Not applicable

Medical Conditions Aggravated: None reported

Chronic Effects: No effects anticipated

Cancer / Reproductive Toxicity Information:

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

WHMIS Hazard Classification: Not applicable

WHMIS Symbols: Not applicable

4. FIRST AID

Eye Contact: Flush eyes with water. Call physician if irritation develops.

Skin Contact (First Aid): Wash skin with plenty of water.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: None required.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: This material will not burn.

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Cover spilled material with a dry acid, such as citric or boric. Scoop up slurry into a large beaker. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Flush reacted material to the drain with a large excess of water.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Maintain general industrial hygiene practices when using this product.

Storage: Keep container tightly closed when not in use.

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Colorless liquid

Physical State: Liquid

Molecular Weight: Not applicable

Odor: None

pH: 11

Vapor Pressure: Not determined

Vapor Density (air = 1): Not determined

Boiling Point: ~ 100° C (~212° F)

Melting Point: Not determined

Specific Gravity (water = 1): ~1.00

Evaporation Rate (water = 1): Not determined

Volatile Organic Compounds Content: Not applicable

Coefficient of Water / Oil: Not applicable

Solubility:

Water: Miscible

Acid: Miscible

Other: Not determined

Metal Corrosivity:

Steel: Not determined

Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Extreme temperatures

Reactivity / Incompatibility: None reported

Hazardous Decomposition: None reported

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported
Skin and Eye Irritation Data: None reported
Mutation Data: None reported
Reproductive Effects Data: None reported

--
Ingredient Toxicological Data: --
No toxicological data available for the ingredients of this product.

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system.

Empty Containers: Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

T.D.G.:

Proper Shipping Name: Not Currently Regulated

--

Hazard Class: NA

PIN: NA

Group: NA

Subsidiary Risk: NA

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories:

Canadian Inventory Status: All ingredients of this product are DSL Listed.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. Technical Judgment.

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE.
HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

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Appendix B

2013 Work Plan and Site Layout Drawings

2013 WORK PLAN

1.0 Introduction

The following document presents the activities Baffinland intends to undertake as part of its 2013 Work Plan. In the event the Project does not advance, all work items described and constructed as per the 2013 Work Plan will be subject to reclamation, as per relevant regulatory and permit obligations.

2.0 Overview of Site Activities for March 2013 to December 2013

This 2013 Work Plan provides for:

- 1) The development and construction of infrastructure required for site capture at Milne Port and the Mine Site for the launching of the 18 MT Mary River Project.
- 2) Ongoing environmental baseline data collection and geotechnical drilling in order to sustain the development of the 18 MT Project. These activities will resume at the Milne Port site, along the Tote Road, at the Mine Site, at numerous quarry sites and at other Project development areas.

The specific scope of activities to be undertaken at each Project site is presented in Section 3 of this Work Plan. The Work Plan is presented within the context of the applicable regulatory authorizations and schedule.

Baffinland holds, or will soon hold, all the permits and authorizations required to carry out the 2013 Work Plan. The main regulatory instruments that allow for the 2013 Work Plan activities include:

- **Project Certificate**
 - All works and activities proposed have been screened by the NIRB and have been considered in the Project Certificate issued by the NIRB on December 28, 2012.
- **Type B Water Licence**
 - The current Type B Water Licence (2BB-MRY1114) authorizes Baffinland to operate the existing sewage treatment plants, incinerators, landfill, wastewater treatment and other facilities regulated by the Nunavut Water Board. A request for a modification to this licence will be submitted shortly, for the construction of an additional 5ML fuel tank construction within the existing secondary containment as well as for the construction of a second PWSP pond at Milne Port (these work items are discussed in section 3.1.2 of this letter). The Type B Water Licence also authorizes Baffinland to undertake mineral exploration and geotechnical drilling programs. Prior to March 31st 2013, Baffinland will submit to the NWB an update of all the environmental management plans associated with the Type B water Licence.
- **Type A Water Licence**
 - The final hearings for the Type A Water Licence associated with the Project Certificate are scheduled for April 23 to 25, 2013, in Pond Inlet. Baffinland expects that the Type A Water Licence will be granted by mid June 2013. The scope of the Type A Water Licence exceeds the requirement of the 2013 Work Plan for all

activities considered in this 2013 Work Plan. Following the issuance of the Type A Water Licence, Baffinland will submit to the NWB updates for the environmental management plans associated with this Water Licence.

- Use and Storage of Explosives
 - Baffinland's Explosives Contractor will obtain the necessary permits and authorizations from NRCan for the use and storage of explosive at the Project sites. It is anticipated that these permits will be obtained prior to commencement of the 2013 Work Plan (expected in mid April 2013).
- Quarry Permits
 - Schedule 'B' Quarry Concession Agreement under IOL Commercial Lease Q10C3001.
 - It is anticipated that quarrying of rock and gravel from permitted quarry locations (as shown on Schedule "A1") of this Lease will continue. In addition, Baffinland will be applying for access and quarry permits to extract rock and gravel material adjacent and near the existing Milne Inlet Tote Road by means of an Amendment to the existing Schedule 'B' to the Lease.
 - The Project Certificate included the detailed assessment of 5 quarries. Two of these quarries will be developed at the onset of the 2013 Work Plan:
 - Quarry Q1 located at Milne Inlet – a site specific Quarry Management Plan was provided in the FEIS (Volume 3, Appendix 3B, Attachment 6: Operation and Management Plan Milne Inlet Quarry). The surface area of the quarry is 200,000 m² and the volume of material to be extracted is approximately 300,000 m³.
 - Quarry QMR2 located at the Mary River Mine Site - a site specific Quarry Management Plan was provided in the FEIS (Volume 3, Appendix 3B, Attachment 6: Operation and Management Plan Mary River Mine Site Quarry). The surface area of the quarry is 252,700 m² and the volume of material to be extracted is approximately 538,000 m³.
 - AANDC Land Use Permit and Quarry Permit to access existing and possibly new borrow and rock quarries adjacent and near the Tote Road.

3.0 Scope of 2013 Construction Activities

3.1 Pre-Sealift Activities – mid April to June 30, 2013

Construction activities will commence in April 2013. Equipment already on site will be used to begin earthworks and site preparation. Beginning in April 2013, key activities will include:

3.1.1 Mary River Mine Site

- Operate the Mary River Exploration Camp and increase occupancy as of mid April 2013. The camp with its associated sewage treatment plant and incinerator will operate in accordance to the terms and conditions of Baffinland's Type B Water Licence.

- Fly in pre-packaged explosives to the Mary River airstrip and transport to explosives magazines at Milne Port for storage and use in quarry operations.
- Construct camp pad and begin installation of construction camp.

3.1.2 Tote Road

Routine maintenance of the Tote Road will continue in 2013. The following activities will be undertaken prior to the sealift:

- Open the Tote Road (snow clearing) in early April;
- Relocate crusher train from the Mary River mine site to Milne quarry site (the crusher will be transported across river ice at four locations where box culverts are now in place);
- Follow up on the requirements pursuant to the Fisheries Authorization for the Tote Road Not Net Loss and Monitoring Program, QIA lease, and AANDC land permit and quarry permit requirements;
- Implementation of a freshet management plan for the Milne Inlet Tote Road to minimize associated environmental risks;
- Develop laydown areas for storage of explosive magazines (3 areas) in proximity of Q1 quarry at Milne Inlet. Position explosive magazines.

Milne Port

- Open the Milne Port camp site (mid April) and operate at full capacity (60 beds). Restart and operate the existing sewage treatment plant at Milne Port and the camp incinerator. The camp will operate in accordance with the terms and conditions of Baffinland's Type B Water Licence.
- Construct a second polishing waste stabilization pond (PWSP) at Milne in preparation for larger off-specification sewage treatment capacity during construction ramp up.
- Begin development of quarry Q1 1+100 (submitted with FEIS) to generate crushed and screened aggregate for the development of the Milne Port site. An estimated aggregate volume of 100,000 m³ will be required for Milne Port site development.
- Earthworks at Milne Port prior to the sealifts will focus on the following areas:
 - Develop laydown area B (used for Owner/Contractor laydown);
 - Develop laydown area A for storage of material and equipment to be received during the 2013 sealift;
 - Develop pad for the expanded camp facilities;
 - Upgrade (extend) the airstrip runway;
 - Construct fuel tank farm secondary containment area;
 - Construct one 5ML diesel fuel storage tank within the secondary containment constructed in 2011 (same construction as existing 5 ML tank);
 - Construct laydown area for waste storage/transfer;
 - Development of parking areas for heavy equipment and rolling stock fleet to be delivered during the sealifts.

3.2 2013 Sealift – July 1st to October 1st, 2013

For Milne Port, it is expected that sealifts will occur between July 1st and October 1st, 2013. An estimated 14 barges/ships (dimension of barges approximately 35 m x 140 m) will be necessary to transport the equipment and material required for the execution of the 2013 Work Plan and execution of the work planned for January to June of 2014.

Material, equipment, fuel and supplies required for construction activities at the Mine Site and the operation of the Mary River facilities will be transported to the Mine Site via the Tote Road during the fall of 2013 and the winter of 2014.

The material, equipment, supplies, buildings and machinery received at Milne Inlet during the sealifts will consist of the following:

3.2.1 Prefabricated Buildings and Fold-away Structures

- Camps complete with dormitories, kitchen facilities, washrooms, laundry facilities;
- Pre-assembled sewage treatment facilities;
- Camp incinerators;
- Emergency services building;
- Power generation equipment with electrical distribution system (several generators ranging from 50 kW to 500 kW);
- Two concrete batch plants;
- Boiler modules;
- Temporary emulsion plant;
- All modular buildings and fold-away structures to be used for offices during the 2013-2014 period. A preliminary list is presented in the table below:

Facility	Quantity
Maintenance shops	3
Trade shops (electrical, carpentry, piping, mechanical)	3
Warehouses	3
Parking garages	3
Tire shops	3
Office complexes	3
Lunchrooms	3
Wash cars	13
Field offices and lunch rooms	10
Fold-away structures	5

3.2.2 Heavy Equipment and Rolling Stock

- All heavy equipment and rolling stock required for the construction activities scheduled from July 2013 to July 2014 (next sealift). An overview of the rolling stock is presented in the table below:

Preliminary list of Rolling Stock and Heavy Equipment			
Description	Quantity	Description	Quantity
Loader	26	Emulsion Delivery Trucks	3
Grader	7	Loader Snow Blower Attachments	5
Track Dozer	13	Development Rock Drills	2
Excavator	11	Production Rock Drill	2
Haul Trucks	23	Crusher 6000 Ton/Day 6" (Cone Crusher)	2
Service trucks (pick-ups)	27	45ft Van Trailer Generator	2
Skidsteer	5	Hot Box	4
Highway Tractor Truck	4	Frost Fighters	12
Low Boy Trailers	8	Drive on Compactor	8
Boom Truck	3	Walk Behind Compactor	4
80 Ton Mobile RT Crane	2	Plate Compactors	4
200 Ton Track Mount	2	Trash Pumps	8
Crane RT	1	Development Drills	4
Crawler Crane	1	Roll Off Truck	2
Vac Truck - Roll Off	2	Potable Water Tank	1
Potable Water Tanks	2	Water Truck	2
Raw Water Tanks	2	Snow Cat	2
Sewage Vac Tanks	4	Fuel and Lube Truck	4
Garbage Bins	25	Tractor Truck	2
Container Handler	2	Low Boy Float	2
Telehandler	4	Low Boy Drop Deck	2
Ambulance	2	Portable Concrete Batch Truck	2
Fire Truck	2	10 cu.yd Mixer Truck	6
Dewatering Pump	4	100ft Pump Trucks	2
Plow/Sand Truck	4	320000BTU Frost Fighter	20
Buses	8	8kW Light Towers	10
Manlift	6	20kW Whisper Watt Gen Set	7
Scissor Lifts	4	185cfm Air Compressor	2
Maintenance Truck c/w Pick	2	400 Amp Welding Machines	
Fuel Delivery Truck - B-Train	2	Portable Grout Plant (3 off Sea Cans)	
Camp Power-Genset(1250)	10	Ice Profiler	
Boiler Modules	1	4" Ice Auger	
Solution Modules	1	4 ton Propane Bullet c/w Refill Station	
Bob Cat	1	10,000 L Gasoline ISO Container	
Air Compressors	2	Rock Breaker	
Magazines	15	Spray Equipment	

3.2.3 Fuel Delivery

At least two bulk fuel deliveries will occur during the 2013 sealift. At the onset of the shipping season, arctic diesel will be delivered to fill the existing 5 ML storage tank and the newly constructed 5 ML steel tank located at the Milne tank farm. In addition, 1.5 ML of jet A fuel will also be included in the initial fuel delivery.

Throughout the summer months, construction will continue on two additional 10 ML steel tanks (within the confine of the tank farm secondary confinement) for the storage of diesel fuel.

Towards the end of the open water season, a second fuel delivery will occur to fill all tankage available at Milne Port. It is expected that this second fuel delivery will consist of 25 ML of arctic diesel and 1.5 ML of jet A fuel.

In addition to bulk fuel delivery, an estimated twelve 100,000L double wall isocontainer fuel storage tanks will be delivered to Milne Port. These isocontainers will provide the fuel storage at various quarry sites and construction sites for the execution of the 2013 Work Plan and the work scheduled for the Tote Road upgrade and bridge construction during the winter of 2014.

3.2.4 Material and Supplies

To the extent practicable, all materials and supplies required to execute the 2013 Work Plan and the work scheduled for January to June 2014 will be received during the 2013 sealifts. This includes:

- Delivery of ammonium nitrate (1.5 million kg);
- Delivery of pre-package explosives;
- Delivery of cement (12,000 tonnes);
- Delivery of construction material (generators, cabling, control centres, etc.);
- Delivery of consumables (lubricants, grease, detergents, dry goods, food, household supplies, etc.);
- Delivery of twelve 100,000L double wall isocontainers for fuel.

3.3 Construction Activities from July 1 to December 31, 2013

As mentioned in Section 2.1, Baffinland expects to be granted its Type A Water Licence by mid June 2013. As equipment and material is delivered by sealifts, additional construction activities will begin. These include:

3.3.1 Milne Port

During the sealift, most of the activities at Milne Port will focus on unloading the barges and positioning received equipment and material in designated laydown areas. In addition, the following construction activities will continue:

- Install emergency response building;
- Construct and commission two 10 ML diesel fuel steel tanks at the tank farm (construction completion before the end of sealift season);
- Construct and commission two additional 10 ML diesel fuel steel tanks at the tank farm;
- Install and commission fuel dispensing system for bulk fuel facility;
- Install and commission camp extension (100 person camp) including sewage treatment plant and incinerator;
- Install concrete batch;
- Construct landfarm;

- Ongoing decommission of the bladder farm;
- Install maintenance shops;
- Install trade shops;
- Install warming shed and parking garage;
- Install warehouses;
- Install administration buildings and field offices.

3.3.2 Tote Road

During the second half of 2013, all equipment, material, fuel, and supplies required for construction activities at Mary River will be transported from Milne Port to the Mine Site via the Tote Road.

The upgrade of the road will commence late in 2013 and is expected to take 8 to 10 months. In order to improve construction efficiency, contractors have expressed the need for establishing a temporary 49 person camp mid-way along the Tote Road.

Should this camp be required, it will be erected in the later part of 2013. Water required for the camp operation would be trucked to this camp from the Mine Site or Milne Port water supply (approved under Type A and current Type B). All sewage generated from this camp would be trucked to either the Mine Site or Milne Port sewage treatment plants. Finally, all waste generated at the camp would also be transported to either the Mine Site or to Milne Port for ultimate disposal. There will be no local discharge from this camp.

3.3.2 Mine Site

Construction activities at the Mine Site will begin shortly after the first sealift. The activities will consist of:

- Development of the quarry QM2 at Mine Site (submitted with FEIS). The expected volume of aggregate required at the Mine Site for the 2013 work is 200,000 m³;
- Complete construction camp pad and installation of the 400 person construction camp facility including sewage treatment plant, incinerator and treated sewage storage pond(s) and discharge pipeline to Mary River;
- Upgrade (extend) of the Mary River airstrip;
- Development of equipment laydown areas for Owner/Contractor;
- Development of parking area for mobile equipment. Mobile equipment fleet will include:
 - Flat bed trucks;
 - Boom trucks;
 - Fuel Tanker trucks;
 - Water tanker trucks;
 - Cranes;
 - Excavators;
 - Graders;

- Pick-up trucks;
- Erect/install:
 - Emergency response building;
 - Concrete batch plant;
 - Emulsion plant;
 - Maintenance shop (including truck wash facility);
 - Trade shops;
 - Warming shed and parking garage;
 - Warehouses;
 - Administration buildings and field offices.
- Construct fuel tank farm secondary containment structure;
- Install 4 x 500,000L double wall diesel fuel tank (tank complete with fuel dispenser);
- Install one 50,000L double wall jet A fuel tank;
- Transfer fuel from Milne Port tankfarm to newly install fuel tanks at the Mine Site;

4.0 Ongoing Exploration and Geotechnical Activities

It is anticipated that the 2013 field work program would include the following items:

- Potentially seasonal occupation of Steensby Inlet and Mid-Rail Camps;
- Fixed wing aircraft and helicopter to support general site activities including environmental monitoring and potentially additional exploration drilling and regional exploration;
- Geotechnical drilling and surveys at project development areas, as required to support Project design requirements:
 - The Tote Road alignment and bridge crossings, a portion of the drilling for bridge design being on ice as well as near water bodies;
 - Port site(s), with land based drilling as well as possible barge based and ice based drilling on the sea ice in Steensby Inlet;
 - Waste rock and ore disposal areas;
 - Milne Inlet Tote Road and bridge crossings, a portion of the drilling for bridge design being on ice as well as near water bodies;
 - Prospective quarry sites and borrow areas along the Tote Road.
- Continue archaeological surveys at project component areas as required.

5.0 Progressive Reclamation of the Exploration and Bulk Sample Project

There will be continued progressive reclamation of areas of current and past use in association with drilling, bulk sample, and historical exploration programs. In addition, progressive reclamation plans will include:

- Development of an action plan to address concerns from stakeholders about long term salt storage;

- The completion of a program to test and dispose of incinerator bottom ash and the development of a plan to management and dispose of ongoing generation of ash;
- Continuing with the ongoing decommissioning of the existing bladder farm at Milne Inlet and the transport of hydrocarbon impacted soils to the planned landfarm facility;
- Development and implementation of a long term multi-year plan to address localized areas of permafrost melting associated with current borrow areas, and taking into consideration the longer term plans for Tote Road upgrades and new quarry development;
- Continued progressive reclamation of areas of current and past use in association with drilling, bulk sample, and historical exploration programs;
- Demobilization of equipment and supplies not required for near term activities, as well as the current inventory of hazardous waste and other materials by means of sealift from Milne Port;
- Continued development of the Mine Site landfill and deposition of non-hazardous wastes in accordance with the landfill operations and maintenance manual; and,
- Discharge of treated sewage stored in PWSPs at Mary River Camp and Milne Inlet after treatment as required. Two periods of discharge are planned, the first corresponding to freshet (May-June), and the second later in the summer if required.

6.0 Workforce and Employment Opportunities

The site work program is expected to begin in April 2013. Until material and equipment are received by sealifts, to a large extent, development activities are limited by availability of equipment currently on site. The work force is expected to peak during the sealifts period. Current estimates of the work force are as follows:

- Milne Port:
 - Pre-sealift period: 70 person
 - Sealift period; 60 to 120 persons
 - Post sealift period: ramp up to 150 person (full camp capacity)
- Mine Site Construction personnel:
 - Pre-sealift period: 8 to 12 persons
 - Sealift period; ramp up to 250 persons
 - Post sealift period: ramp up to 180 person

The 2013 work program will offer employment opportunities for many residents of northern Baffin Island. Baffinland will endeavor to maximize Inuit employment throughout 2013. Baffinland's "Work Ready Program" along with site specific training will prepare potential Inuit employees for these job opportunities. Job advertisements for a number of positions are currently posted in all the North Baffin communities. In addition, Baffinland will provide guidance to all its Contractors for training requirements and Inuit employment in the contract documents.

7.0 Early Revenue Phase (ERP) Environmental Impact Assessment

As stated in correspondence to the NIRB on January 13, 2013, due to various business drivers, Baffinland proposes to make changes to the schedule and some activities in the initial stages of project development associated with the Mary River Project Proposal for which the NIRB recently issued Project Certificate No. 005 (the 'Project Certificate').

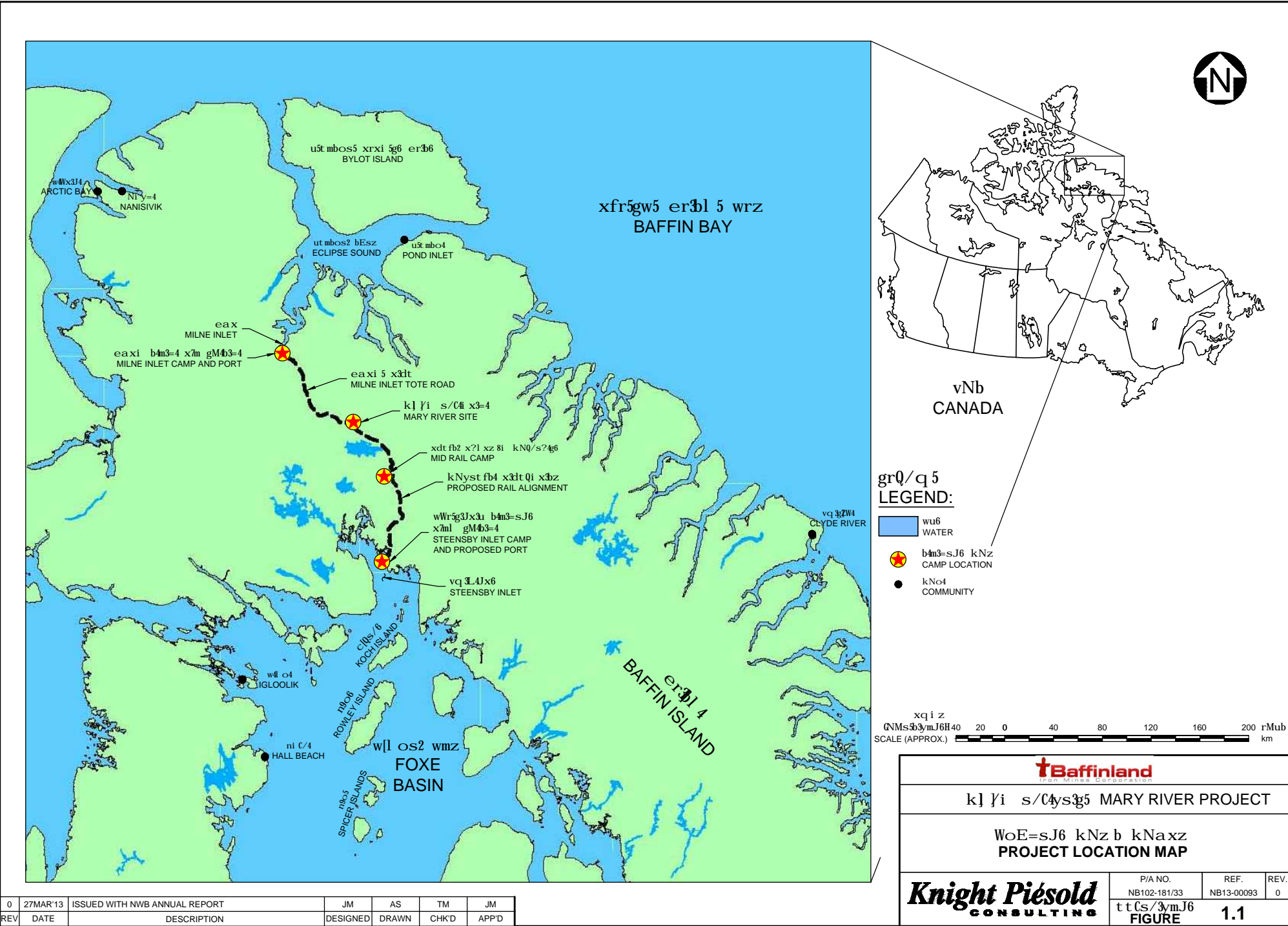
In its request to the NIRB, Baffinland indicated that although the Proponent remains committed in the long-term to developing the Project as authorized in the Project Certificate, in the short term Baffinland proposes to change some development activities and project timelines to accommodate a proposed "Early Revenue Phase" which would include development of a nominal 3.5 million tonnes per annum (Mt/a) road haulage operation from the Mary River mine site to a port facility at Milne Inlet for shipping of iron ore during the open water season. As noted by Baffinland, this development option was presented previously as a project alternative, and was included within the initial technical review of the Draft Environmental Impact Statement for the Mary River Project Proposal.

Baffinland recognizes that this Early Revenue Phase will require an amendment to the Project Certificate which in turn requires the submission and review of an Environmental Impact Assessment. In accordance to the directives issued by the NIRB, Baffinland expects to complete its Environmental Impact Assessment for the Early Revenue Phase (ERP) of the Project by June 2013. It is anticipated that this EIA will be submitted to the NIRB by June 30, 2013, and the proposal will be subjected to the NIRB review process which is expected to be completed by the first quarter of 2014.

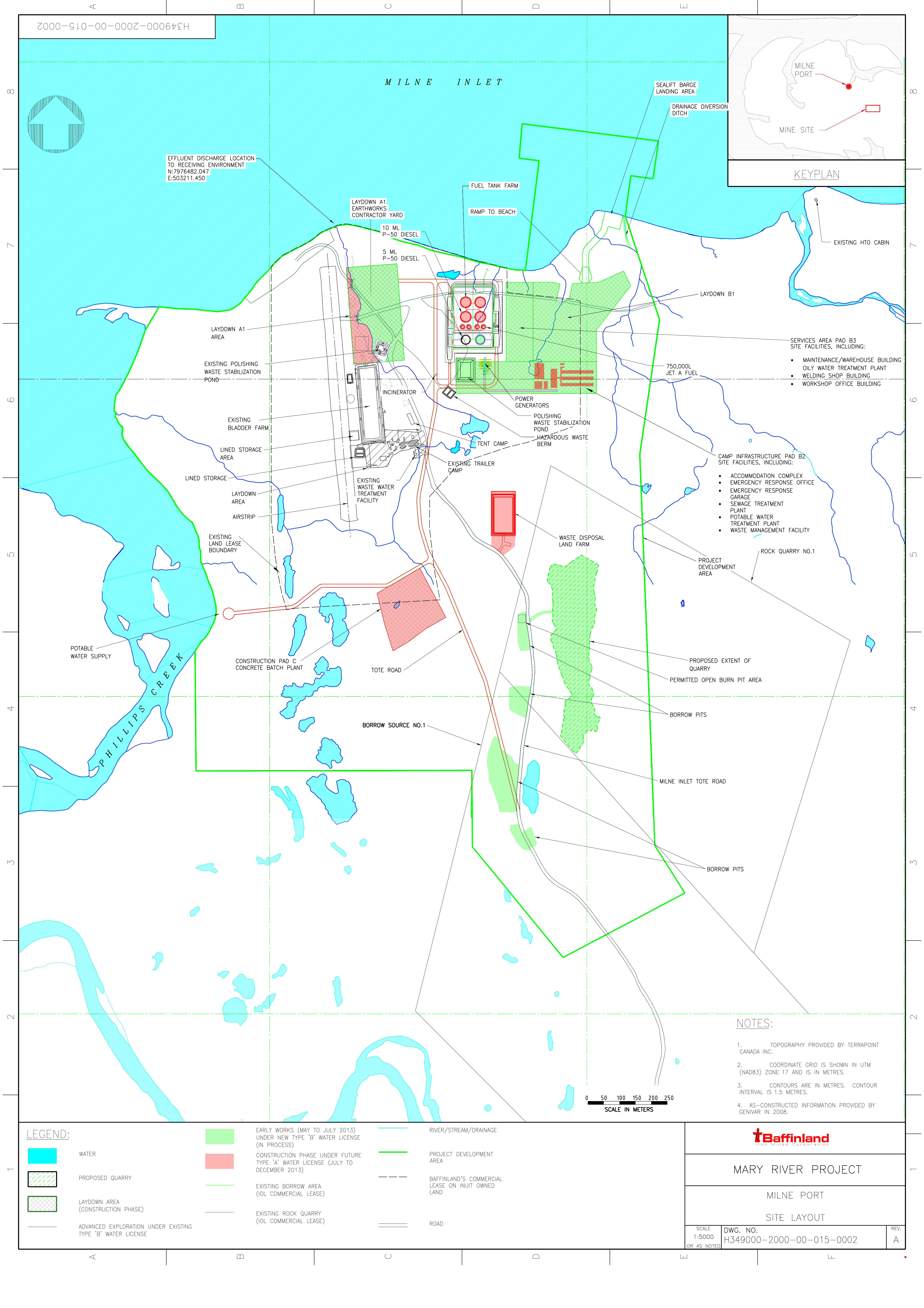
Once a favorable decision is granted from the Minister of AANDC with respect to the ERP, and subject to obtaining any amendments (if any) which might be necessary to the Water Licence, Baffinland will proceed with the construction of facilities required for the completion of the ERP. This work will be included in the 2014 Work Plan, once the Project Certificate has been amended.

8.0 Potential 2014 Bulk Sampling Campaign

In addition to the scope of activities described herein, Baffinland is also considering the undertaking of a second "bulk ore sampling" campaign. This campaign would consist of mining up to 500,000 tonnes of ore for shipment to potential customers via Milne Port during the 2014 open water season. A feasibility study is in progress and a decision by Baffinland's Board of Directors on whether to proceed with this bulk sampling campaign is expected by the end of March 2013. Should the decision of the Board be favorable, an addendum to this 2013 Work Plan will be submitted in April 2013. This addendum will highlight additional activities that must be undertaken in 2013 in order to execute the 2014 bulk sampling campaign.



0	27MAR'13	ISSUED WITH NWB ANNUAL REPORT	JM	AS	TM	JM
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D



H349000-2000-00-015-0002

MILNE INLET

SEALIFT BARGE
LANDING AREA

DRAINAGE DIVERSION
DITCH

KEYPLAN

MILNE
PORT

MINE SITE

EXISTING HTO CABIN

EFFLUENT DISCHARGE LOCATION
TO RECEIVING ENVIRONMENT
N:7976482.047
E:503211.450

LAYDOWN A1
EARTHWORKS
CONTRACTOR YARD

FUEL TANK FARM

RAMP TO BEACH

10 ML
P-50 DIESEL

5 ML
P-50 DIESEL

LAYDOWN A1
AREA

EXISTING POLISHING
WASTE STABILIZATION
POND

INCINERATOR

EXISTING BLADDER FARM

LINED STORAGE
AREA

LINED STORAGE

LAYDOWN
AREA

AIRSTRIIP

EXISTING
LAND LEASE
BOUNDARY

POTABLE
WATER SUPPLY

PHILLIPS CREEK

CONSTRUCTION PAD C
CONCRETE BATCH PLANT

TOTE ROAD

BORROW SOURCE NO.1

WASTE DISPOSAL
LAND FARM

750,000L
JET A FUEL

POWER
GENERATORS

POLISHING
WASTE STABILIZATION
POND

TENT CAMP

HAZARDOUS WASTE
BERM

EXISTING TRAILER
CAMP

SERVICES AREA PAD B3
SITE FACILITIES, INCLUDING:

- MAINTENANCE/WAREHOUSE BUILDING
- OILY WATER TREATMENT PLANT
- WELDING SHOP BUILDING
- WORKSHOP OFFICE BUILDING

CAMP INFRASTRUCTURE PAD B2
SITE FACILITIES, INCLUDING:

- ACCOMMODATION COMPLEX
- EMERGENCY RESPONSE OFFICE
- EMERGENCY RESPONSE GARAGE
- SEWAGE TREATMENT PLANT
- POTABLE WATER TREATMENT PLANT
- WASTE MANAGEMENT FACILITY

ROCK QUARRY NO.1

PROJECT
DEVELOPMENT
AREA

PROPOSED EXTENT OF
QUARRY

PERMITTED OPEN BURN PIT AREA

BORROW PITS

MILNE INLET TOTE ROAD

BORROW PITS

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 1.5 METRES.
4. AS-CONSTRUCTED INFORMATION PROVIDED BY GENIVAR IN 2008.

0 50 100 150 200 250
SCALE IN METERS

LEGEND:

- WATER
- PROPOSED QUARRY
- LAYDOWN AREA (CONSTRUCTION PHASE)
- ADVANCED EXPLORATION UNDER EXISTING TYPE 'B' WATER LICENSE
- EARLY WORKS (MAY TO JULY 2013) UNDER NEW TYPE 'B' WATER LICENSE (IN PROCESS)
- CONSTRUCTION PHASE UNDER FUTURE TYPE 'A' WATER LICENSE (JULY TO DECEMBER 2013)
- EXISTING BORROW AREA (IOL COMMERCIAL LEASE)
- EXISTING ROCK QUARRY (IOL COMMERCIAL LEASE)
- RIVER/STREAM/DRAINAGE
- PROJECT DEVELOPMENT AREA
- BAFFINLAND'S COMMERCIAL LEASE ON INUIT OWNED LAND
- ROAD

Baffinland
Iron Mines Corporation

MARY RIVER PROJECT

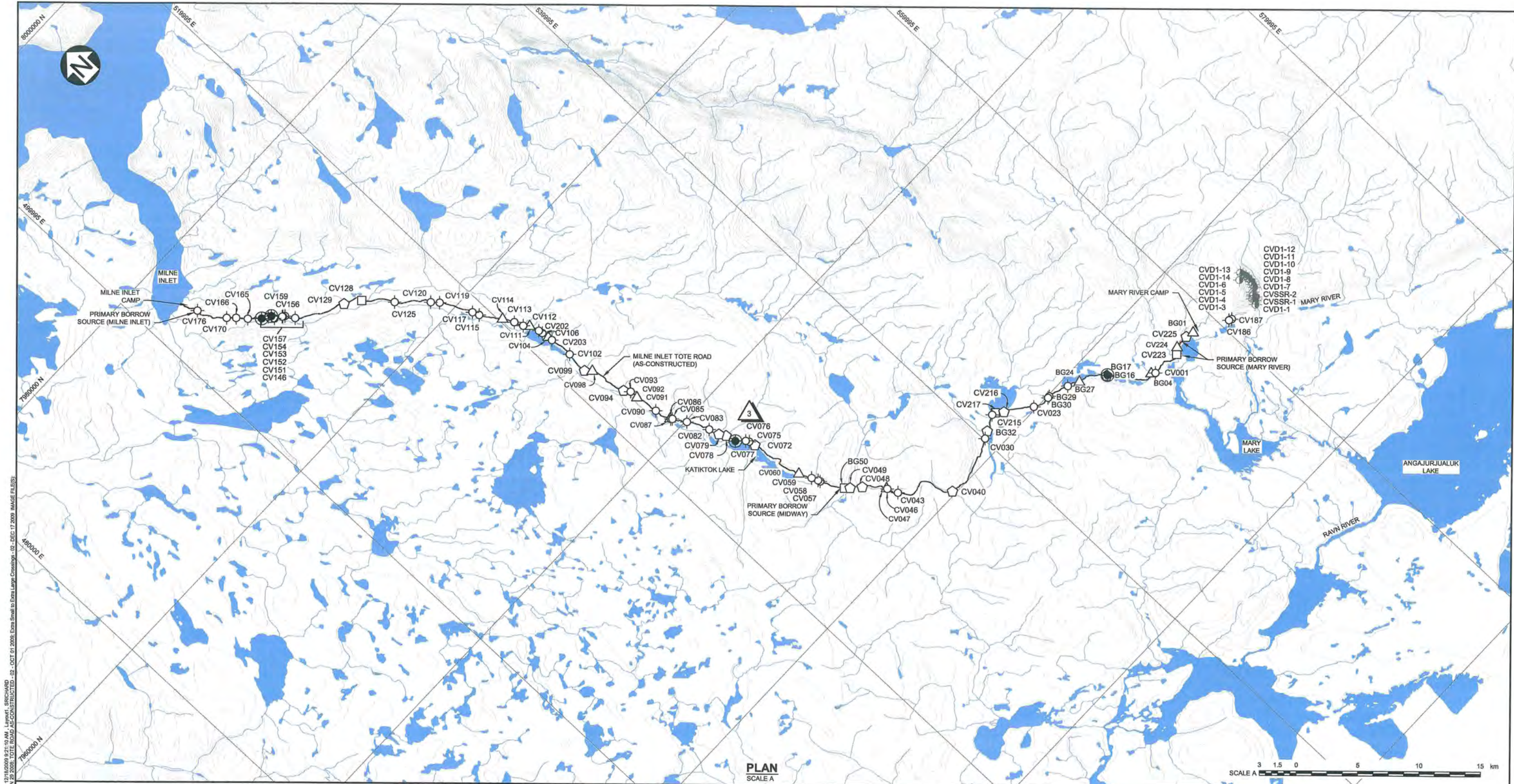
MILNE PORT

SITE LAYOUT

SCALE
1:5000
OR AS NOTED

DWG. NO.
H349000-2000-00-015-0002

REV.
A



SAVED: 11/10/2009 11:10:11 AM; User: D:\p0000000; 12/15/2009 9:21:10 AM; PRINTED: 12/15/2009 9:21:10 AM; Layout: 1; RICHARD; XREF: FILED: Bases Map; Milne Inlet; TOTE ROAD AS-CONSTRUCTED; -31 - JAN 29 2008; TOTE ROAD AS-CONSTRUCTED; -02 - OCT 17 2009; Extra Small to Extra Large Crossings; -02 - DEC 17 2009; MAGE FILED;

PLAN
SCALE A

SCALE A 3 1.5 0 5 10 15 km

- LEGEND:**
- WATER
 - MILNE INLET TOTE ROAD
 - AIRSTRIIP
 - EXPLORATION CAMP LOCATION
 - CULVERT LOCATIONS
 - EXTRA SMALL CROSSING
 - SMALL CROSSING
 - MEDIUM CROSSING
 - LARGE CROSSING
 - EXTRA LARGE CROSSING

- NOTES:**
1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHT OF CANADA, DEPARTMENT OF NATURAL RESOURCES, (2004). ALL RIGHTS RESERVED.
 2. CONTOURS ARE IN METRES. CONTOUR INTERVAL VARIES.
 3. COORDINATE GRID IS SHOWN IN UTM (NAD 83) ZONE 17 AND IS IN METRES.
 4. MILNE INLET TOTE ROAD ALIGNMENT SURVEY PROVIDED BY GENIVAR (SURVEY COMPLETED IN JULY 2008).
 5. EXTRA SMALL CROSSINGS DISPLAYED ARE DFO CROSSINGS REGULATED.

REV	DATE	DESCRIPTION	DESIGN	DRAWN	CHKD	APPD
3	DEC 18'09	NOTE 5 ADDED - DUPLICATE CV049 REMOVED	EV	SIR	AP	KE
2	DEC 19'08	UPDATED WITH AS-BUILT INFORMATION	CAP	MD/BSP	AP	KE
1	JUL 31'07	ISSUED FOR CONSTRUCTION	KH/BP	MD	AP	KE
0	JUL 13'07	ISSUED IN FINAL	KH/BP	MD	AP	KE

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Knight Piésold
CONSULTING

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT - BULK SAMPLE PROGRAM

**DRAINAGE CROSSING LOCATIONS PLAN
(ALL CROSSINGS)**

XREF FILE	DRG. NO.	DESCRIPTION	REV	DATE	DESCRIPTION	DESIGN	DRAWN	CHKD	APPD	0	JUL 13'07	ISSUED IN FINAL	KH/BP	MD	AP	KE						
	REFERENCE DRAWINGS				REVISIONS					REV	DATE	DESCRIPTION	DESIGN	DRAWN	CHKD	APPD						
										REVISIONS												
																		P/A NO.	DRAWING NO.		REVISION	
																		NB102-181/10		400		3