

	<p align="center"><b>Hope Bay Mining Ltd.</b></p> <p align="center"><b>Site Operations Management System</b></p>	Document No: Version No: Issue Date: Page No:	HB-OPS-SOP ### 1.0 June 3,, 2010 1
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## **Standard Operating Procedure: Handling, Storage and Application of Dust Suppressant EK-35**

### **1. PURPOSE**

This document describes procedures for working safely and in an environmentally sound manner with dust suppressant EK-35 at Hope Bay project sites in order to achieve effective suppression of dust.

### **2. SCOPE**

This procedure applies to all applications of EK-35 and all personnel at Hope Bay that may have the potential to come into contact with, handle, store or apply EK-35.

### **3. DEFINITIONS**

EK-35	Synthetic, organic, non-toxic, non-hazardous, non-flammable dust control product
ESR	Department of Environmental and Social Responsibility
HSLP	Department of Health, Safety and Loss Prevention

### **4. RESPONSIBILITY**

Title or Position	Key Responsibilities
Application Operator	Review this SOP and the product MSDS prior to handling or applying EK-35, utilize appropriate PPE, observe proper environmental protection and be familiar with spill response procedures
Supervisor	Ensure this SOP is current, relevant, and reviewed and understood by all personnel involved with the handling, storage or application of EK-35, including environmental protection measures and emergency response protocols.
Manager	Review and approve this SOP
Facilities Manager	Ensure appropriate facilities are provided to for proper protected storage of EK-35
ESR	Ensure appropriate regulatory approvals/notifications are in place before any application of EK-35 and that sampling and monitoring of the application of product is conducted
HSLP	Ensure this SOP contains appropriate controls relevant to worker safety

### **5. REGULATORY APPROVAL FOR USE**

The application of EK-35 at the Hope Bay project site is contingent on special regulatory approval as this product is not approved for use as a dust suppressant in Nunavut. Refer to the site Environmental Department for permission to apply.

### **6. NOTIFICATION TO REGULATOR**

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In accordance with the *Environmental Guideline for Dust Suppression* – Nunavut Department of Sustainable Development, the local Environmental Protection Officer will be notified with the following information when dust suppressants are planned for use:

- The location of the site
- The product used
- A timetable for the work

This information will be conveyed to the Environmental Department for notification to the regulator before the application of the EK-35 is scheduled to commence.

### **7. ENVIRONMENTAL PROTECTION AND CONTROLS**

Nozzles on the EK-35 truck-mounted applicator will be set in position as low to the application surface as practicable to prevent airborne transport of any product. The optimal height of the nozzles above ground should be 18 inches. The viscosity of the product varies with temperature; the aim of the application is to achieve spray of droplets as opposed to atomization.

EK-35 will not be applied to road surfaces within 30 metres of any active culvert/watercourse and will not be applied during periods of wind speed greater than 20km/hr. and if rain is predicted within the next 12 hours.

The product will be applied in a manner that will not allow pooling or permit any runoff beyond the road/laydown pad margins.

Water sampling pre- and post-application in water adjacent to the application area will be undertaken by the environmental department and results provided to the regulatory agency if requested.

### **8. SAFE STORAGE AND HANDLING**

- EK-35 should be stored in a cool, dry, well ventilated area in secondary containment
- EK-35 is non-flammable, but will burn on prolonged exposure to flame or high temperature.
- Keep away from sources of ignition and separate from oxidizing agents
- EK-35 can be stored indefinitely at any temperature and will not freeze

### **9. EXPOSURE CONTROL/PERSONAL PROTECTION**

- RESPIRATORY PROTECTION: None required if good ventilation is maintained. If mist is generated by heating or spraying use a NIOSH approved organic respirator with a mist filter.
- VENTILATION: Under normal handling conditions special ventilation is not necessary. If operation generates mist or fumes use ventilation to keep exposure to airborne contaminants below exposure limits.
- EYE PROTECTION: Chemical splash, goggles recommended.
- PROTECTIVE CLOTHING: Clothing to minimize skin contact, long sleeves, boots or shoes. For casual contact PVC gloves are suitable, for prolonged contact use neoprene or nitrile gloves.

### **10. GENERAL INFORMATION ON EK-35**

- EK-35 is applied “neat” without mixing with any other substance

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- Weather (rain) is not a consideration in the application of EK-35 as it will not “wash” away
- The application of EK-35 by sprayer should be applied in one continuous operation to ensure a consistent finish.
- Multiple passes may be required to achieve a desired finish without run-off and excessive puddling of excess product.
- EK-35 can be re-worked without re-application.

### **11. APPLICATION OF EK-35**

The application of EK-35 will be performed in accordance with the Site Services Work Package: *Placing Crush and EK-35 on the Airstrip*. This application is in accordance with the application amount as determined by the vendor of the product, and utilizing truck-mounted rented application equipment supplied by them (Midwest industrial Supply, Inc.). The vendor is to provide instructions on how to use the application equipment safely and effectively. All employees involved in handling or applying the EK-35 are to read the MSDS for the product.



Monitoring of application will be conducted by the on site quality control consultant identified in the Site Services work package to verify and adjust as needed the correct rate and volume of application. A daily log of application of EK-35 will be maintained including the location applied (ie: sector or descriptive road section)

### **12. SPILL CLEAN-UP**

Clean-up of spilled EK-35 should be performed with inert sorbents. Soiled sorbent material can be burned in the incinerator. All spills must be reported immediately to the Environmental Department.

### **13. ASSOCIATED DOCUMENTS**

*Environmental Guideline for Dust Suppression* – Nunavut Department of Sustainable Development

### **14. REQUIRED RECORDS**

Application records: date, location, volumes, operator, etc.

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### MSDS

<http://www.midwestind.com/products-services/dust-control-products/ek35-dustcontrol/ek35-brochure-msds.html>

MATERIAL SAFETY DATA SHEET		Midwest Dust Control
<h1>EK35<sup>®</sup></h1> <h2>Synthetic Organic Dust Control<sup>®</sup></h2>		
<b>SECTION I — IDENTIFICATION OF SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING</b>		
TRADE NAME:	EK35 <sup>®</sup> Synthetic Organic Dust Control <sup>®</sup>	
CHEMICAL NAME:	Isoalkane and Binder System	
SYNONYMS:	Dust Retardant and Stabilization Agent	
CHEMICAL FAMILY:	Formulated Isoalkane and Binder (Patents #7,081,270 and #7,074,266) Product A Blend - No Number Assigned	
CAS REGISTRY NO.:		
<b>SECTION II — COMPOSITION/INFORMATION ON INGREDIENTS</b>		
NAME	%	CAS REG NO.
Severely hydrotreated, high viscosity synthetic iso-alkane	30 - 70%	Non-hazardous
Carboxylic Acids (fatty acids)	30 - 70%	Non-hazardous
<b>SECTION III — HAZARDS IDENTIFICATION</b>		
Synthetic Isoalkane	May be irritating to breathing passages upon excessive heating, otherwise this product is essentially non-hazardous Mist 8 hour TLV-TWA = 5mg/m <sup>3</sup> (ACGIH)	
<b>SECTION IV — FIRST AID MEASURES</b>		
EYES:	Flush eyes with flowing water at least 15 minutes, get medical attention. Do not use any eye ointment. Remove contact lenses. Move subject to fresh air. If victim is not breathing perform artificial respiration. Administer oxygen if available. Keep victim warm and at rest. Seek medical attention as soon as possible.	
INHALATION:	Flush with large amount of water or wash with soap and water. Seek medical attention if irritation persists.	
SKIN:	Do NOT induce vomiting because of aspiration into the lungs. EK35 <sup>®</sup> has a laxative effect and will be eliminated quickly. Seek medical attention.	
INGESTION:	Do NOT induce vomiting because of aspiration into the lungs. EK35 <sup>®</sup> has a laxative effect and will be eliminated quickly. Seek medical attention.	
<b>NEVER GIVE FLUIDS OR INDUCE VOMITING IF PATIENT IS UNCONSCIOUS OR HAVING CONVULSIONS.</b>		
NOTE TO PHYSICIAN:	Monitor respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis or pneumonitis.	
<b>SECTION V — FIRE FIGHTING MEASURES</b>		
FLAMMABILITY:	Nonflammable, but will burn on prolonged exposure to flame or high temperature.	
FLASH POINT (TEST METHOD):	>284°F (>140°C), open cup, ASTM D92, Cleveland	
AUTOIGNITION TEMPERATURE:	>455°F (235°C)	
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Do not cut, weld, heat or drill or pressurize empty container. Low fire hazard. Must be moderately heated before ignition will occur. Avoid contact with strong oxidizing agents, including peroxides, chlorine and strong acids.	
MATERIALS TO AVOID:	Carbon dioxide, carbon monoxide, smoke and irritating fumes as products of incomplete combustion.	
PRODUCTS OF COMBUSTION:	Carbon dioxide, carbon monoxide, smoke and irritating fumes as products of incomplete combustion.	
<b>EXTINGUISHING MEDIA AND INSTRUCTIONS:</b>		
If a tank, railcar or a tank truck is involved in a fire isolate for 0.5 miles in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from the area and let the fire burn itself out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discoloration of the tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. <b>SMALL FIRE:</b> use dry chemicals, foam, CO <sub>2</sub> <b>LARGE FIRE:</b> use water spray, fog or foam. For small outdoor fires portable extinguishers may be used and SCBA (self-contained breathing apparatus) may not be required. For all indoor fires and any significant outdoor fires SCBA is required. Respiratory and eye protection are required for fire fighting personnel.		
<b>SECTION VI - ACCIDENTAL RELEASE MEASURES</b>		
SPILL AND LEAK PROCEDURES:	ELIMINATE ALL IGNITION SOURCES. Stop leak without risk and contain spill. Absorb with inert absorbent materials such as clay or sand. Place absorbent materials in closed metal containers for later disposal or burn in appropriate facility. Keep spills out of sewers and open bodies of water.	
<b>SECTION VII — HANDLING AND STORAGE</b>		
STORAGE:	Keep in a cool, dry, ventilated storage area and in closed containers. Keep away from sources of ignition and oxidizing materials.	
HANDLING:	KEEP AWAY FROM SOURCES OF IGNITION! Do not reuse empty containers. Practice good hygiene. Wash hands before eating. Launder clothes before reuse. Discard saturated leather goods.	
<b>SECTION VIII — EXPOSURE CONTROL/PERSONAL PROTECTION</b>		
RESPIRATORY PROTECTION:	None required if good ventilation is maintained. If mist is generated by heating or spraying use a NIOSH approved organic respirator with a mist filter.	
VENTILATION:	Under normal handling conditions special ventilation is not necessary. If operation generates mist or fumes use ventilation to keep exposure to airborne contaminants below exposure limits. Chemical splash, goggles recommended.	
EYE PROTECTION:	Clothing to minimize skin contact, long sleeves, boots or shoes. For casual contact PVC gloves are suitable, for prolonged contact use neoprene or nitrile gloves.	
PROTECTIVE CLOTHING:		
Midwest Industrial Supply, Inc. 1101 3rd Street Southeast Canton, Ohio 44711 www.midwestind.com Tel 330.456.3121 Fax 330.456.3247 Emergency Phone Number 1.800.321.0699		

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## Standard Operating Procedure: Handling, Storage and Application of Dust Suppressant EK-35

### SECTION IX — PHYSICAL AND CHEMICAL PROPERTIES

<b>BOILING/MELTING POINT @ 760 mm Hg:</b>	>493°F (>256°C)
<b>VAPOR PRESSURE mm Hg @ 20°C:</b>	Negligible at ambient temperature
<b>SPECIFIC GRAVITY OR BULK DENSITY:</b>	0.85 - 0.95
<b>SOLUBILITY IN WATER:</b>	Insoluble in water
<b>APPEARANCE:</b>	Viscous, brown-colored liquid
<b>ODOR:</b>	None
<b>POUR POINT:</b>	<15°F (<9°C)
<b>VISCOSITY (Brookfield):</b>	150 - 250 cps @ 20°C 550 - 650 cps @ 0°C 750 - 850 cps @ -5°C
<b>pH:</b>	N/A, not an aqueous solution or emulsion
<b>ACIDITY:</b>	None
<b>ALKALINITY:</b>	None

### SECTION X — STABILITY AND REACTIVITY

<b>STABILITY:</b>	Stable under normal handling conditions. Stable stored at temperatures between -40°F and +180°F.
<b>CHEMICAL INCOMPATIBILITY:</b>	Can react with strong organic oxidizing materials.
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide, smoke, hydrocarbons and irritating fumes.
<b>HAZARDOUS POLYMERIZATION:</b>	Does not occur under normal industrial conditions.
<b>CONDITIONS TO AVOID:</b>	Excessive heat and flame.
<b>CORROSIVE TO METAL:</b>	No

### SECTION XI — TOXICOLOGICAL INFORMATION

<b>EFFECTS OF OVEREXPOSURE</b>	
<b>INHALATION:</b>	Inhalation is highly unlikely. However prolonged or repeated inhalation of fumes or mists may cause irritation to the respiratory tract. Product deposits in lungs may lead to fibrosis and reduce pulmonary function.
<b>SKIN:</b>	It is not a skin irritant. However, prolonged or repeated contact may cause skin irritation, dermatitis or oil acne.
<b>EYES:</b>	Prolonged or repeated contact may be irritating to eyes. Will not cause permanent damage.
<b>INGESTION:</b>	Relatively non toxic to digestive tract.
<b>MUTAGENIC:</b>	Mutagenic activity test are negative toward: Salmonella Typhimurium, Salmonella-Escherichia coli and Chinese Hamster ovary.
<b>REPRODUCTIVE TOXICITY:</b>	Based on data to date it does not pose a reproductive risk.
<b>CARCINOGENICITY:</b>	Based on studies to date EK35® is not known to be carcinogenic to humans. <ul style="list-style-type: none"> <li>ACGIH (mists) - Based on available human studies, exposure to product mist alone has not demonstrated to cause human effects at levels below 5 mg/m<sup>3</sup>.</li> <li>IARC - IARC group 3; cannot be classified as to carcinogenicity to humans.</li> <li>NTP - No studies were found.</li> <li>IRIS - No studies were found.</li> <li>OSHA - OSHA PEL (8 hour TWA) = 5 mg/m<sup>3</sup> for synthetic product mists.</li> </ul>

### SECTION XII — ECOLOGICAL INFORMATION

<b>EK35® Aquatic Toxicity Test Results</b>	
• Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, EPA/600/4-90/027E.	
• Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002.	
• Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms, EPA/600/4-91/003.	

### SECTION XII — ECOLOGICAL INFORMATION - continued

	Ceriodaphnia dubia	Fathead minnow	Americamysis bahia	Rainbow trout
<b>ACUTE/SURVIVAL (mg/L)</b>				
LC50	>1000	271	111	—
NOEC	1000	125	63	—
LOEC	>1000	250	130	—
<b>CHRONIC/SURVIVAL (mg/L)</b>				
LC50	>1000	97.3	58.6	23
NOEC	500	31.3	25	10
LOEC	1000	62.5	50	20
<b>CHRONIC/GROWTH/ REPRODUCTION (mg/L)</b>				
LC50	375	114	>50	>10
NOEC	250	31.3	50	10
LOEC	500	62.5	>50	>10

See attached test results:  
 1. ABC Laboratories, Inc. Americamysis bahia, Fathead minnow, Ceriodaphnia dubia.  
 2. ABC Laboratories, Inc. Rainbow trout

LC50	- Lethal Concentration, 50%
NOEC	- No Observable Effects Concentration
LOEC	- Lowest Observable Effects Concentration

The LC50 level is the lethal concentration of the chemical under test that kills 50% of the test organisms in the specified amount of time. According to the EPA-540-9-85-006, suggested toxicity criteria for materials are listed in the table below. Comparison of the EPA guidelines to the LC50 of EK35® show a range of toxicity from practically non-toxic to moderately toxic depending on the species and the exposure time. When used and applied properly EK35® is not known to pose any ecological problems.

### SECTION XIII — DISPOSAL CONSIDERATIONS

<b>WASTE DISPOSAL METHOD:</b>	Consult your local authorities for regulations. Preferred waste management: recycle or reuse, incinerate with energy recovery, disposal in a licensed facility. Disposal facility should be compliant with state, local and federal government regulations.
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### SECTION XIV — TRANSPORTATION INFORMATION

<b>D.O.T. PROPER SHIPPING</b>	
<b>NAME (49CFR172.101):</b>	None
<b>HAZARDOUS SUBSTANCE (40CFR116):</b>	N/A
<b>REPORTABLE QUANTITY (RQ):</b>	N/A
<b>D.O.T. HAZARD</b>	
<b>CLASSIFICATION (49CFR172.101):</b>	Non-regulated
<b>D.O.T. PLACARDS REQUIRED:</b>	None
<b>POISON CONSTITUENT (49CFR173.343):</b>	N/A
<b>BILL OF LADING DESCRIPTION:</b>	dust control agent
<b>C N.O.:</b>	N/A
<b>UN/NA CODE:</b>	N/A

### SECTION XV — REGULATORY INFORMATION

<b>EPA SARA Title III hazard class:</b>	None
<b>OSHA HCS hazard class:</b>	Non-OSHA hazardous (29CFR1910.1200)
<b>EPA SARA Title III Section 313(40CFR372)</b>	
<b>Toxic Chemicals present in quantities greater than the "de minimus" level are:</b>	None
<b>Canadian WHMIS:</b>	This product is not a "controlled product" under the Canadian Workplace Hazardous Material Information System (WHMIS)
<b>Canadian DSL:</b>	All components of this product are listed on DSL (Domestic Substance List).
<b>California Proposition 65:</b>	Does not contain any Prop 65 chemicals.

### SECTION XVI — OTHER INFORMATION

<b>ABBREVIATIONS AND SYMBOLS:</b>	N.D. - Not Determined
	N.A. - Not Applicable
	N.T. - Not Tested
	< - Less Than
	> - Greater Than

Midwest Industrial Supply, Inc.  
 1101 3rd Street Southeast  
 Canton, Ohio 44711  
 www.midwestind.com

Tel 330.456.3121  
 Fax 330.456.3247  
**Emergency Phone Number 1.800.321.0699**

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## EK-35 Application Log Sheet

Date	Location	Volume Applied (L)	Operator Name	Comments

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### **REVISION RECORD**

<b>Version</b>	<b>Date</b>	<b>Description</b>	<b>Author</b>	<b>Signature</b>
	April 10/10	Draft	J. Turk	
	May 15/10	Draft Revision – include notification to regulator prior to use Section 6. Application Log Sheet	J. Turk	
	June 2/10	Updates to Environmental Controls	J. Turk	

### **SOP ACTIVATION RECORD**

**THIS SOP WILL BE IN EFFECT ON THE ISSUE DATE APPROVED BY THE UNDERSIGNED.**

<b>POSITION</b>	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE OF ACCEPTANCE</b>

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**STANDARD OPERATING PROCEDURE  
REVIEW AND ACKNOWLEDGEMENT**

By signing off on this Standard Operating Procedure, (SOP) you acknowledge that you have reviewed, understand and accept the terms of this SOP.

First Name (Print)	Last Name (Print)	Company	Position	Date	Signature	HBML Representative

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