

## KB-1<sup>®</sup> Plus Material Safety Data Sheet

### Section 1: Material Identification

**Trade Name:** KB-1<sup>®</sup> Plus

**Chemical Family:** bacterial mixture

**Chemical name:** No IUC name for mixture is known to exist

**Manufacturer/Supplier:** SiREM  
130 Research Lane, Suite 2,  
Guelph, Ontario,  
Canada N1G 5G3

**For Information call:** 519-822-2265 / 1-866-251-1747 x236

**Emergency Number:** 519-822-2265

**Description:** Microbial inoculum (non-pathogenic, non-hazardous)

**Trade Name:** KB-1<sup>®</sup> Plus

**Product Use:** Bioremediation of contaminated groundwater.

**Date Prepared:** 23 October 2008

### Section 2: Composition, Information on Ingredients

KB-1<sup>®</sup> Plus is a microbial culture grown in a dilute aqueous mineral salt solution media containing no hazardous ingredients.

The microbial composition of KB-1<sup>®</sup> Plus is listed in Table 1.

**Table 1. Major Microbial Groups Identified in KB-1<sup>®</sup> Plus Microbial Inoculum**

<i>Dehalococcoides</i> sp.
<i>Geobacter</i> sp.
<i>Methanomethylovorans</i> sp.
<i>Dehalobacter</i> sp.
<i>Dehalogenimonas</i> sp.

### Section 3: Hazards Identification:

A review of the available data does not indicate any known health effects related to normal use of this product.

### Section 4: First Aid Measures:

Avoid direct contact with skin and eyes. In any case of any exposure which elicits a response, a physician should be consulted immediately.

**Eye Contact:** Flush eyes with water for at least 15 minutes, occasionally lift upper and lower eyelids, if undue irritation or redness occurs seek medical attention.

**Skin Contact:** Remove contaminated clothing and wash skin thoroughly with water and antibacterial soap. Seek medical attention if irritation develops or open wounds are present.

**Ingestion:** Do not induce vomiting, drink several cups of water, seek medical attention.

**Inhalation:** Remove to fresh air. If not breathing give artificial respiration. In case of labored breathing give oxygen. Call a physician.

### **Section 5 - Fire Fighting Measures:**

Non-flammable

Flash Point: not applicable

Upper flammable limit: not applicable

Lower flammable limit: not applicable

### **Section 6 – Accidental Release Procedures**

Spilled KB-1<sup>®</sup> Plus should be soaked up with sorbant and saturated with a 10% bleach solution (prepared by making a one in ten dilution of diluted standard bleach [normally sold at a strength of 5.25% sodium hypochlorite] to disinfect affected surfaces. Sorbant should be double bagged and disposed of as indicated in section 12. After removal of sorbant, area should be washed with 10% bleach solution to disinfect. If liquid from the culture vessel is present on the fittings, non-designated tubing or exterior of the stainless steel pressure vessel liquid should be wiped off and the area washed with 10% bleach solution.

### **Section 7 - Handling and Storage**

KB-1<sup>®</sup> Plus is shipped in stainless steel pressure vessels in a protective over pack. KB-1<sup>®</sup> Plus should be handled with care to avoid any spillage. Vessels are shipped with 1 pound per square inch (psi) pressure; valves should not be opened until connections to appropriate lines for subsurface injection are in place.

**Storage Requirements:** Avoid exposing stainless steel pressure vessels to undue temperature extremes (i.e., temperatures less than 0°C or greater than 30°C may result in harm to the microbial cultures and damage to the vessels). All valves should be in the closed position when the vessel is not pressurized or not in use to prevent the escape of gases and to maintain anaerobic conditions in the vessel. Avoid exposure of the culture to air as the presence of oxygen will kill dechlorinating microorganisms.

### **Section 8 - Exposure Controls/Personal Protection**

#### **Personal protective equipment:**

Skin: Protective gloves (latex, vinyl or nitrile) should be worn.

Eye Protection: Wear appropriate protective eyeglasses or goggles when opening pressure vessels, valves, or when pressurizing vessels to inject contents into the subsurface.

Respiratory: No respiratory protection is required.

Engineering Controls: Good general room ventilation is expected to be adequate.

### **Section 9: Physical and Chemical Properties:**

Physical State: liquid

Odour: skunky odour

Appearance: dark grey, slightly turbid liquid under anaerobic conditions, pink if exposed to air (oxygen).

Specific gravity: 1

Vapor pressure: not applicable

Vapor density: not applicable

Evaporation rate: not determined

Boiling point: ~100° C

Freezing point/melting point: ~ 0°C

pH: 6.5-7.5  
Solubility: fully soluble in water

### **Section 10 – Stability and Reactivity Data**

Stable and non-reactive.  
Maintain under anaerobic conditions to preserve product integrity.  
Materials to avoid: none known

### **Section 11 - Toxicological Information**

Potential for Pathogenicity:

KB-1<sup>®</sup> Plus has tested negative (i.e., the organisms are not present) for a variety of pathogenic organisms listed in Table 2. While there is no evidence that virulent pathogenic organisms are present in KB-1<sup>®</sup> Plus, there is potential that certain organisms in KB-1<sup>®</sup> Plus may have the potential to act as opportunistic (mild) pathogens, particularly in individuals with open wounds and/or compromised immune systems. For this reason standard hygienic procedures such as hand washing after use should be observed.

**Table 2, Results of Human Pathogen Screening of KB-1<sup>®</sup> Plus**

<b>Organism</b>	<b>Disease(s) Caused</b>	<b>Test result</b>
<i>Salmonella</i> sp.	Typhoid fever, gastroenteritis	Not Detected
<i>Listeria monocytogenes</i>	Listerioses	Not Detected
<i>Vibrio</i> sp.,	Cholera, gastroenteritis	Not Detected
<i>Campylobacter</i> sp.,	Bacterial diarrhea	Not Detected
<i>Clostridia</i> sp.,	Food poisoning, Botulism, tetanus, gas gangrene	Not Detected
<i>Bacillus anthracis</i>	Anthrax	Not Detected
<i>Pseudomonas aeruginosa</i>	Wound infection	Not Detected
<i>Yersinia</i> sp.,	Bubonic Plague, intestinal infection	Not Detected
Yeast and Mold	Candidiasis, Yeast infection etc.	Not Detected
Fecal coliforms	Indicator organisms for many human pathogens diarrhea, urinary tract infections	Not Detected
<i>Enterococci</i>	Various opportunistic infections	Not Detected

### **Section 12. Disposal Considerations**

Material must be disinfected or sterilized prior to disposal. Consult local regulations prior to disposal.

### **Section 13 – Transport Information**

Non-hazardous, non-pathogenic microbial inoculum  
Chemicals, Not Otherwise Indexed (NOI), Non-hazardous  
Not subject to TDG or DOT guidelines.

### **Disclaimer:**

The information provided on this MSDS sheet is based on current data and represents our opinion based on the current standard of practice as to the proper use and handling of this product under normal, reasonably foreseeable conditions.

Last revised: 12 June 2012