

# **LINEBAC®**

## **Microbial Ecosystem for Municipal Collection Line and Wastewater Treatment**

### **COLLECTION SYSTEM PROBLEMS**

Municipal wastewater contains many dissolved and suspended contaminants that present big problems for collection system managers. Contaminants such as fats, grease, soap scum and cellulose can stick to the collection lines and restrict the water flow, even to the point of causing blockage and subsequent back-ups. Clearing blocked lines the traditional way is a difficult job requiring expensive jetting equipment and usually overtime labor. Back-ups are embarrassing and can be costly for utilities. Now, through biotechnology there is a reliable and easy to use treatment that offers a preventative maintenance solution.

### **THE BIOTECHNOLOGY SOLUTION: LINEBAC Microbial Ecosystem**

Microorganisms are nature's own method of eliminating organic waste. The specially selected mixtures of live microbes contained in LINEBAC, along with the enzymes they secrete, are well suited to digesting fat, oil and grease (FOG) and other organic matter as it enters and flows through the collection system. The LINEBAC microbes adhere to the collection system lines and lift station walls. In digesting organic waste, they reproduce and form colonies to consume even more floating waste and accumulated FOG. The wall coating also acts as a lubricant to help reduce back-ups. The by-products of microbial digestion are perfectly natural, environmentally safe substances like carbon dioxide and water.

### **PRODUCT DESCRIPTION**

LINEBAC is a highly concentrated microbial ecosystem containing specialized natural microorganisms selected for maximum efficiency in the biodegradation of organic contaminants in industrial and municipal wastewater. It is supplied as a dry fine granule, packaged in water-soluble bags for ease of use.

### **BENEFITS OF LINEBAC USAGE**

- Maintains free flowing collection systems.
- Reduces the floating FOG blanket and accumulation of grease on lift station walls.
- Reduces line and manhole deterioration due to sulfates.
- Saves utilities money versus mechanical and chemical line cleaning.
- Environmentally friendly approach.
- Contains no hazardous caustic, surfactants or solvents.
- Supplied in dry granular form for optimum stability.
- Easy to handle water-soluble bags.

### **APPLICATION SUGGESTIONS**

Application techniques are very important to the success of any biological product. LINEBAC treatment dosage depends on how plugged the collection lines are at the start of treatment and how large the ongoing FOG load is. In addition to the following general guidelines, customized usage suggestions are available from the Epicore Municipal Distributor.

**General Application Guidelines**

Gravity Mains:

- (1) Start at the furthest downstream line section.
- (2) Treat the first 500 feet of line first before moving upstream.
- (3) For best results apply LINEBAC one or two manholes upstream of the treatment section.
  - 1) If not able to dose upstream, make two inch slit in bag before dosing or,
  - 2) If dosing at beginning of line, soak bags in water for 15 minutes before dosing.
- (4) Make the initial treatment based on the following rates (# of 0.5 lb. LINEBAC bags):

<b>Line Diameter (Inches)</b>	<b>Light Grease – Initial Treatment</b>		<b>Heavy Grease - Initial Treatment</b>	
	<b># bags/day</b>	<b># days</b>	<b># bags/day</b>	<b># days</b>
4-6	1	4	2	5
8	2	4	3	5
10	4	4	5	5
12	5	4	6	5
14	6	4	8	5
16	8	4	10	5
18	10	4	12	5
20	12	4	18	5
22	16	4	16	5
24	18	4	18	5

- (5) Repeat the process for each next upstream 500-foot section until the entire line section is clean.
- (6) Once each line section is inoculated with LINEBAC and clean, begin the maintenance treatment program on each 1,000-foot section.
  - 1) After the last section is initially treated and cleaned, the entire line can be treated at one time.
  - 2) Treat once per week.
  - 3) Best results are obtained by treating one manhole upstream of the problem line section.
    - 31) If not able to dose upstream, make a two-inch slit in bag before dosing or,
    - 32) If dosing at beginning of line, soak bags in water for 15 minutes before dosing.
  - 4) Make the maintenance treatment based on the following rates (# of 0.5 lb. LINEBAC bags, once per week per 1000 feet of line):

<b>Line Diameter (Inches)</b>	<b>Light Grease – Maintenance Treatment</b>	<b>Heavy Grease - Maintenance Treatment</b>
4-6	1	2
8	2	4
10	4	6
12	5	7
14	6	8
16	8	10
18	10	12

20	12	14
22	16	18
24	18	19

**Mains and Siphons:**

- (1) For best results apply LINEBAC one or two manholes upstream of the treatment section.
- (2) Raise upper and lower floats 1-6 inches.
- (3) If heavy grease deposits are present as a ring or ridge or as float deposits, apply LIPOSOLVE at a rate of one quart per manhole for each of ten days starting after beginning LINEBAC treatment.
- (4) Apply LINEBAC based on level of flow according to the schedule indicated below:

<u>Application Timing</u>	<u>LINEBAC Rate (0.5 lb. bags per 100,000 gal. flow)</u>
First two days	2.5/day
Next five days	1.25/day
Thereafter: once/week	2.0/week

**PARAMETERS FOR USE**

	<u>Optimum</u>	<u>Minimum</u>	<u>Maximum</u>
pH	7.0	4.5	9.0
Dissolved oxygen	> 3 ppm	2 ppm	none
Carbon/nitrogen ratio	10:1	10:1	20:1
Temperature <sup>a</sup>	86°F	56°F	104°F
Compatibilities:	avoid concentrated toxicants like heavy metals, disinfectants and acids		
a.	At lower temperatures, increase LINEBAC dosage to maintain performance.		

**PRODUCT SPECIFICATIONS**

Overall, the number of microorganisms the product contains best measures microbial product quality. The typical measurement is done by plate count and is reported in terms of microbe cells (called colony forming units or CFU) per gram of product. Epicore manufactures LINEBAC to have as high a strength as possible in order to give the municipal customer the best value. Customers should be careful when comparing microbial products. Some that claim higher cell counts will distort the truth and quote counts for quantities of product greater than one gram. For example, a pound of LINEBAC contains over 900 billion cells but the specification is,

LINEBAC Specification = 2,000,000,000 (2E+9) CFU per gram minimum

**PRODUCT FORM AS SUPPLIED**

For long-term stability LINEBAC is supplied as a dry fine granule. As supplied, the microorganisms in LINEBAC are alive but in a dormant state. When added to water, the microorganisms become activated and begin vegetative growth utilizing the organic contaminants available. For ease of handling, LINEBAC is supplied in 0.5 pound water-soluble bags packed in 5 gallon plastic pails.

**PRODUCT STORAGE:** Biological products are unlike inert chemical products. They require special treatment during storage and handling,

- Do not store continuously at temperatures above 40°C (104°F).
- Do not freeze (the water-soluble bags may break).
- Store out of direct sunlight in a well-ventilated area.
- Keep product dry until ready to use.

- Do not mix with any materials not recommended by Epicore, especially disinfectants and harsh chemicals.

**SAFETY:** LINEBAC utilizes natural microorganisms, which are harmless to humans, plants and animals. LINEBAC does not contain genetically altered microorganisms. LINEBAC does not contain toxic or hazardous chemicals, acids, caustics or solvents. It is not corrosive to metal, ceramic and plastic. Users are advised to consult the Material Safety Data Sheet for further information and guidance.

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**IMPORTANT NOTICE TO PURCHASER:**

“Epicore BioNetworks Inc. (“Epicore”) warrants that the product conforms to its compositional description and is reasonably fit for the purpose stated on the label when used in accordance with the label instructions under normal conditions of use. There are no other express or implied warranties, whether as to merchantability, fitness for any use, or otherwise, given in respect of the product. Neither Epicore nor its agents shall be liable for any damage, loss, or injury, whether the same arises directly or consequentially, by reason of any matter whatsoever relating to the use of the product, and any buyer’s or user’s exclusive remedy in any instance shall be limited to a refund of the purchase price paid.

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