

COMMONWEALTH BIOMONITORING  
8061 Windham Lake Drive  
Indianapolis, IN 46214  
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# *PATHOGEN ASSESSMENT*

Grand Calumet/Little Calumet Rivers

Hammond, Indiana

Autumn 2002

## **Section 1**

### **Executive Summary**

The Hammond Sanitary District commissioned an assessment of bacterial pathogens in the Little Calumet and Grand Calumet Rivers of Lake County, Indiana. The purpose of the testing was to determine whether Hammond's 14 combined sewer overflows (CSOs) could contribute to a public health problem in the streams.

A sterile sediment bag technique was used for monitoring. This technique uses the unique ability of sandbags to "remember" where bacterial contamination occurs over time. Eight samplers were suspended upstream and downstream from all CSO overflow points. The samplers were set on November 13, 2002 and retrieved December 31, 2002. Each sampler was returned to the lab and aliquots of sand were analyzed for total coliform and *E. coli* bacteria.

All sites had samplers containing bacteria. Bacteria counts indicated "negligible" or "low" potential health risks at sites in the Little Calumet River. Health risks were higher in the Grand Calumet, especially near Columbia Avenue. Efforts to control CSO overflows should concentrate on outfalls near Columbia Avenue.

**Little Calumet/Grand Calumet Pathogen Assessment  
Hammond, Indiana**

**Section 2  
Introductory Information**

**Table I  
GENERAL**

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**NPDES Permit number:**

- IN0023060

**Stream Reach Characterization Approach:**

- Bacterial pathogen analysis

**Wastewater Treatment Plant location:**

- Hammond Sanitary District  
5143 Columbia Avenue  
Hammond, Indiana 46320

**Name of combined sewer overflow receiving water body:**

- Little Calumet River
- Grand Calumet River

**Name of laboratory conducting the tests:**

- Commonwealth Biomonitoring  
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Indianapolis, Indiana 46214  
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**Little Calumet/Grand Calumet Pathogen Assessment  
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**Table II  
COMBINED SEWER OVERFLOW INFORMATION**

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**Number of overflow points**

- o 14

**Location of monitored overflow points**

- o See Attached Map
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**Little Calumet/Grand Calumet Pathogen Assessment  
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**Table III  
SAMPLING INFORMATION**

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Sampling points:

- Four sites on the Little Calumet. Four sites on the Grand Calumet

Collection dates:

- Set - November 13, 2002
- Retrieved - December 31, 2002

Sample collection method:

- Sterile sandbag technique
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**Section 3**  
**Test Methods and Results**

Table IV  
**METHODOLOGY**  
Pathogen Analysis

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**Test methods used:**

- Hach's m-colibblue24 membrane filtration for total coliforms and *E. coli*.

**Reference methods:**

- Standard Method 9222 with Hach m-colibblue media for total coliforms and *E. coli*.

The sterile sandbag technique is described by Nix et al. 1994. Water Environment Research 66:814-818.

**Date samplers placed in water:**

- November 13, 2002

**Date samplers retrieved:**

- December 31, 2002.

**Volume of sand used in the analysis:**

- 0.5 grams in 99 ml dilution water.
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**Little Calumet/Grand Calumet Pathogen Assessment  
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	Total Coliforms CFU/g	<i>E. coli</i> CFU/g
	_____	_____
1. Little Calumet Hwy 41 Upstream	568	46
2. Little Calumet Hwy 41 Downstream	240	8
3. Little Calumet Columbia Ave.	224	10
4. Little Calumet Hohman Ave.	326	58
5. Grand Calumet Hohman Ave.	2142	142
6. Grand Calumet Columbia Ave.	1294	332
7. Grand Calumet WWTP	380	220
8. Grand Calumet Toll Road	378	44

**Little Calumet/Grand Calumet Pathogen Assessment  
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**DISCUSSION**

Coliform bacteria were present in all sandbag samples. Coliform bacteria are present everywhere in water and, although their presence indicates the possibility of fecal contamination, they are not very good health risk predictors. The highest concentrations of total coliforms were in the Grand Calumet River at Hohman Avenue and Columbia Avenue.

*E. coli* bacteria were also present in all samples. Of the two bacterial types measured, *E. coli* are considered the most reliable indicator of potential human health hazards. There are no standards for *E. coli* in sand at the present time. However, if the U.S. EPA criteria for water are applied (listed in Federal Register Vol. 51, No. 45, March 7, 1986), the following swimming-associated illness rates might be expected:

<i>E. coli</i> per gram	Illness Rate per 1000 Swimmers
1	7 (negligible risk)
10	16 (low risk)
100	26 (moderate risk)
1000	35 (high risk)

Negligible Risk	Little Calumet Highway 41 Columbia Ave.
Low Risk	Little Calumet Upstream from Highway 41 Hohman Avenue Grand Calumet Toll Road
Moderate Risk	Grand Calumet Wastewater Treatment Plant Hohman Ave.
Highest Risk	Grand Calumet River Columbia Ave.

The study shows that the greatest environmental benefit would occur if efforts were focused on reducing overflows near Columbia Avenue.