

BioRem-2000™

Wastewater Solutions



Case Studies

Clift Industries, Inc.
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City of Rock Hill, SC

Observed & Documented by: Mr. Hancock, Operations Superintendent
Start Date: September 26, 2002 Ending Date: November 26, 2002

Test Site:

Manchester Creek Waste Water Treatment Plant

The Problem:

The City of Rock Hill was spending over \$500,000 a year on sludge removal. Mr. Hancock was looking for an alternative solution to the traditional belt press process in order to reduce cost.

Treatment Provided:

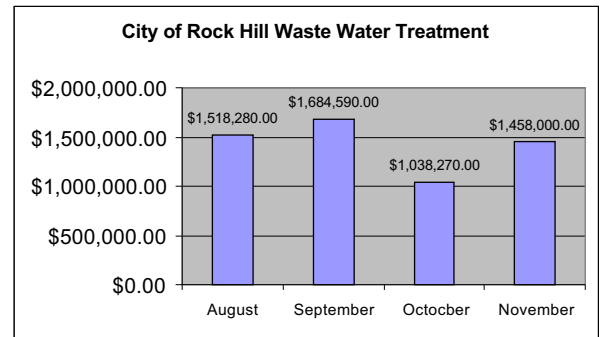
On 10/04/02, BioRem-2000 Water Treatment Sludge™ was introduced at a rate of 4 parts per million. On 10/31/02, treatment was temporarily stopped for a brief period of 15 days. On 11/15/02, treatment was once again administered at the same rate previously used.

Results:

Sludge: For the month of September, the amount of sludge pressed increased 10% from the month of August. In October, after using BioRem-2000 Water Treatment Sludge™ for 27 days, the amount of sludge pressed dropped 39% from the month of September. In November, the amount of sludge pressed increased 38%. This was due to the fact that BioRem-2000 Water Treatment Sludge™ was not being applied for the first 15 days of November.

Quotes: “Went from running my belt press everyday to going 5 - 7 days without running it at all.”

- No product was added to effluent during August and September.
- Started adding product on October 4th.
- Stopped adding product on October 31st.
- Started adding product on November 15th.



City of Georgetown, SC

Observed & Documented by: Cedric A. Hudson , Chief Operator
Start Date: March 19, 2005 Ending Date: March 22, 2005

Test Site:

Waste Water Treatment Plant-Sequential Batch Reactor (SBR) Plant 12 million GPD

The Problem:

To drop the sludge in the holding tank (capacity 1,000,000 gallons) *ONE FOOT* a month, the City of Georgetown was spending over \$52,000.00 a year on sludge removal. The cost was based on having one person running the belt press 8 hours a day for 12 days a month plus polymer, electricity and hauling off sludge. Mr. Hudson was looking for an alternative solution to using the traditional belt press to reduce his spending and to free up man power.

Treatment Provided:

On 3/19/05, 30 gallons of BioRem-2000 Water Treatment™ Sludge was poured directly into the holding tank. It was mixed for 4 hours and then it was shut down. No blowers were turned on; no wasting was done and no any additional mixing was performed.

Results:

On 3/22/05, the sludge level in the holding tank had dropped **8 feet**. In 3 days, they had accomplished what would normally take 8 months and over 768 hours of manpower at **25%** of their normal cost.

LITTLE RIVER, SC

Contact Persons:

Everette T. Compton, Executive Manager
Little River Water and Sewage Company, Inc.

Test Information:

Tests conducted at 6 liftstations/wetwells

Purpose:

Reduction of Hydrogen Sulfide (H2S) levels (measured in Heavy, Moderate, Mild) and fats, oils and grease (FOG) level (measured in inches of scum layer).

Test Site 1 Woodridge

| <u>Date</u> | <u>H2S Odor Level</u> | <u>FOG Level</u> |
|--------------------|------------------------------|--|
| October 5, 2004 | Moderate | Scum layer covering 100% of entire well (2" thick) |
| October 15, 2004 | Mild | Scum layer reduced by 50% (1" in thickness) |
| October 30, 2004 | Mild | Scum layer reduced an additional 25% (4 patches of scum 4" to 6" in diameter remaining less than 1" thick) |

Test Site 2 Watson

| <u>Date</u> | <u>H2S Odor Level</u> | <u>FOG Level</u> |
|--------------------|------------------------------|---|
| October 5, 2004 | Moderate | Heavy scum layer covering 100% of entire well (2" to 3" thick) |
| October 15, 2004 | Mild | Scum layer reduced 70% (1" thick) |
| October 30, 2004 | Very mild | Scum layer reduced an additional 20% (3 small patches remaining less than 1" thick) |

Test Site 3 Parkway

| <u>Date</u> | <u>H2S Odor Level</u> | <u>FOG Level</u> |
|--------------------|------------------------------|---|
| October 10, 2004 | Moderate | Heavy scum layer covering 100% of entire well (2" to 3" thick) |
| October 15, 2004 | Mild | Scum layer reduced 60% (1" thick) |
| October 30, 2004 | Very mild | Scum layer reduced an additional 20% (1 small patch remaining less than 1" thick) |

Test Site 4 Morgan

| <u>Date</u> | <u>H2S Odor Level</u> | <u>FOG Level</u> |
|--------------------|------------------------------|-------------------------|
| October 15, 2004 | Heavy | Patchy scum layer |
| October 30, 2004 | Moderate | None |

Test Site 5 East Point

| <u>Date</u> | <u>H2S Odor Level</u> | <u>FOG Level</u> |
|--------------------|------------------------------|--|
| October 5, 2004 | Heavy | Very heavy scum layer covering 100% of well (3" to 4" thick) |
| October 15, 2004 | Mild | Scum layer reduced 80% (less than 2" thick) |
| October 30, 2004 | Very mild | Scum layer reduced to 2 patches (approximately 2 feet diameter and covered with 2" of soap suds) |

Test Site 6 Marion

| <u>Date</u> | <u>H2S Odor Level</u> | <u>FOG Level</u> |
|--------------------|------------------------------|---|
| October 10, 2004 | Moderate | Scum layer covering 100% of well (2" thick) |
| October 15, 2004 | Mild | Scum layer reduced 50% (less than 1" thick) |
| October 30, 2004 | Very mild | Scum layer reduced to light film |

Mt. Pleasant Waste Water Treatment Plant

Customer:

Gary Perritt, Superintendent
Mt. Pleasant Waste Water Treatment Plant
1760 Labor Camp Rd.
Mt. Pleasant, SC 29465

Date:

May 2005

Targeted Problem:

Fats, oils and grease (FOG) build-up on the wall and within the wet well with a total accumulation of 6 or more inches of FOG, together with odor.

Product Used:

BioRem-2000 Water Treatment™ FOG

Application:

Wet well was shocked with 25 gallons of BioRem-2000 Water Treatment™ FOG, followed by introducing 1 gallon per day for 30 days to the wet well as a standard treatment.

Short Term Results:

A 40% reduction of FOG build-up and elimination of odor problem after 15 days of treatment.

Long Term Results:

Maintain reduction of odor and FOG build-up in wet well and lines.

Poultry Processing

CI conducted two independent tests at a poultry processing site. At the first site, the phosphorus levels dropped 0.670 in three days. At the second site, the phosphorus dropped 0.190 from its highest point in four days. BioRem-2000 Water Treatment™ Phosphorous significantly reduced the phosphorous levels in a minimal amount of time. Note the higher level of phosphorus that needed to be reduced, the greater the results. Secondary benefits of the product were the reduction of the BOD and TSS.

| Test Date | Phosphorous | | Ammonia | | TSS | |
|----------------------|-------------------|------|-------------------|------|-------------------|-------|
| | Pre-Treated/After | Effl | Pre-Treated/After | Effl | Pre-Treated/After | Effl |
| 1 st Site | Infl | Effl | Infl | Effl | Infl | Effl |
| 9/2/2004 | 15.00 | 0.97 | 3.15 | 0.95 | 2952 | 18.50 |
| 9/3/2004 | 15.00 | 0.97 | 20.50 | 1.51 | 996 | 21.30 |
| 9/4/2004 | 13.00 | 0.39 | 29.50 | 1.95 | 657 | 9.80 |
| 9/5/2004 | 19.00 | 0.30 | 33.00 | 0.95 | 1912 | 6.40 |

| Test Date | Phosphorous | | Ammonia | | TSS | |
|----------------------|-------------------|------|-------------------|------|-------------------|------|
| | Pre-Treated/After | Effl | Pre-Treated/After | Effl | Pre-Treated/After | Effl |
| 2 nd Site | Infl | Effl | Infl | Effl | Infl | Effl |
| 11/17/2004 | 14.5 | 0.24 | 5.50 | 0.40 | 8520 | 9.8 |
| 11/18/2004 | 17.0 | 0.34 | 14.0 | 2.32 | 8160 | 8.5 |
| 11/19/2004 | 17.0 | 0.20 | 26.0 | 0.67 | 7860 | 4.5 |
| 11/20/2004 | 11.0 | 0.37 | 32.5 | 0.66 | 8000 | 4.7 |
| 11/21/2004 | 9.50 | 0.15 | 30.0 | 0.62 | 7460 | 3.5 |