

KILLER FOAM

A Pretreatment Horror Story

Westside WWTP

March 2013



- Permitted 6.2 MGD
- Daily Avg flow 3.7 MGD
- 4 SIUs (3 CIUs)
- SIU flow 0.559 MGD

Westside WWTP

Today



- Permitted 10.0 MGD
- 5-Stage BNR
- Daily Avg flow 3.1 MGD
- 4 SIUs (3 CIUs)
- SIU Flow 0.559 MGD

Piedmont Chemical Industries, Inc.

- Operations started 1937
- Specialty toll chemical manufacturing
- Initial Permit issued June 1994
- CIU – Part 414.85 (Subpart H)
- Permitted flow 0.100 MGD
- Daily Average flow 0.049 MGD

**Monday,
March 4, 2013**

22:00 – Operators notice high oxygen demand in first cells of aeration basin

**Tuesday,
March 5, 2013**

17:30 – Operators notify ORC they have foam issues. ORC contacted the Lab Manager

Monday Effluent data:

BOD: <2 mg/L (*normal*)

TSS: <2.5 mg/L (*normal*)

Ammonia: 0.31 mg/L (*normal*)

Fecal: 1 (*normal*)

Tuesday Effluent data:

BOD: >6 mg/L (*not normal*)

TSS: 43.0 mg/L (*not normal*)

Ammonia: 6.69 mg/L (*not normal*)

Fecal: <1 (*normal*)

Wednesday, March 6, 2013

- 08:30 Lab Manager advises PT Supervisor (on the way to Raleigh) about the situation at Westside
- PT Supervisor directs PT Lab analyst to visit both OCPSF industries that discharge to Westside (lab manager went too.)
 - KAO Specialties – normal conditions reported and observed.
 - Piedmont Chemical – admits discharging without using defoamer; product, a component of conditioner, is not manufactured regularly.
 - POTW collected an aliquot of Piedmont's Tuesday composite sample:
 - BOD: 356 mg/L (55.44 lbs)
 - TSS: <40 mg/L (<6.0 lbs)
 - POTW directed Piedmont Chemical to conduct COD analyses on retained samples from March 4th

Wednesday, March 6th Data

Piedmont Chemical

- Flow: 0.052 MGD
- BOD: 597 mg/L (258.91 lbs)
- TSS: 1733.3 mg/L (751.70 lbs)
- Limits:
 - BOD: DM 1200.96 lbs, MA 417.0 lbs
 - TSS: DM 480.38, MA 166.8 lbs

Westside

- Flow: 3.2 MGD
- BOD: 35.5 mg/L (*not normal*)
- TSS: 51.5 mg/L (*not normal*)
- Ammonia: 16.4 mg/L (*not normal*)
- Fecal: >2420 (*not normal*)

March 6th FOAM!



Filter influent channel



Effluent Filter #3



Effluent Wet well



Effluent Flume



Effluent Grate



Richfork Creek

Thursday

March 7, 2013

- ORC Advises the plant is having settling problems.
- Contacted Piedmont Chemical, requested MSDS for products manufactured that would have made up the discharge on Monday, March 4th
- PT Supv notified WSRO Staff.

Westside Effluent Data:

- BOD: 45 mg/L (*not normal*)
- TSS: 27.9 mg/L (*not normal*)
- Ammonia: 19.4 mg/L (*not normal*)
- Fecal: >2420 (*not normal*)

Piedmont Chemical COD Data

- Monday, March 4th: 38,000 mg/L
- Tuesday, March 5th: 7760 mg/L
- Wednesday, March 6th: 6480 mg/L
- Estimated BOD loading based on COD results:
 - Performed 3 yr. average BOD/COD ratio
 - Average ratio: 0.341
 - Ratio based on average BOD/COD: 0.304
 - Literature ratio: 0.67

Estimated BOD Concentration

March 4th COD result 38,000 mg/L and Flow 0.043 MGD

- Average ratio: 0.341
 - 12,963 mg/L (4649 lbs)
- Ratio based on average BOD/COD: 0.304
 - 11,552 mg/L (4143 lbs)
- Literature ratio: 0.67
 - 25,460 mg/L (9130 lbs)
- Westside MAHL = 15,512 lbs
- Westside MAIL = 3,750 lbs

Friday March 8, 2013

- Spoke with Piedmont's VP/COO
 - (EHS Mgr. on vacation)
- Stated produced chemical that is active ingredient in conditioner and water insoluble and it left a waxy deposit on their system.
- Manufactured week prior but was part of discharge on Monday.
- Insisted they were not cause of the upset
- Disputes the COD results for Monday 3/4

Westside Effluent Data:

- BOD: 29 mg/L
- TSS: 11.9 mg/L
- Ammonia: 17.5 mg/L
- Fecal: 6510

NPDES Weekly Violations:

- BOD
- Ammonia
- Fecal

Tuesday, March 11th

- Written request for information sent to Piedmont:
 - Copies of all wastewater operator records for the week of March 4th
 - *Production records for all products manufactured that were part of the wastewater stream(s) discharged on Monday, March 4th. ♦*
 - Include the MSDS
 - Frequency the products are manufactured
 - *Product referred to as “active ingredient in conditioner” ♦*
 - Product formulation
 - MSDS for all ingredients that make-up the formulation
 - Schematic or diagram of the reaction, including side reactions and waste streams and disposition of the waste streams

♦When submitted, materials were declared confidential business information

Effluent Data

Monday, March 11th

- BOD: 32 mg/L
- TSS: 11.9 mg/L
- Ammonia: 12.8 mg/L
- Fecal: 1844

Tuesday, March 13th

- BOD: 26 mg/L
- TSS: 14.9 mg/L
- Ammonia: 11.7 mg/L
- Fecal: >2420

The Truth

- Meeting with Piedmont Friday, March 15th
- Disclosed at the meeting that during the manufacturing process there was a “catastrophic” boil-over incident during heat-up stage, caused by a faulty temperature gauge.
- Piedmont employee was burned
- 39,460 lbs ($\pm$ 3000 gallons) of unreacted product was lost. It was isolated in the pit but due to the automatic pump, some made it to the ww treatment.
- Pit cleaned and contents hauled by A & D Environmental.
- Rest of material isolated in 2-16,000 gal tanks (for offside disposal)

Summary

- Catastrophic boil over incident caused unreacted/partially reacted product to be released.
- Operator allowed discharge of high strength wastewater because he didn't factor in the dilution factor into in-house COD result.
- Failed to notify POTW about the incident.
- Less than truthful about what really happened.

Summary continued

- SIU's SPCC plan reviewed once discovered it was an actual spill.
 - Plan was not followed
- As a result of the incident, Westside experienced NPDES permit limit violations for March:
 - Weekly BOD limit (two weeks)
 - Weekly Ammonia limit (three weeks)
 - Weekly Fecal limit (two weeks)
 - BOD monthly average
 - Ammonia monthly average
- On March 15th, Westside WWTP was “re-seeded” using Eastside WWTP sludge

Enforcement

Notices of Violation Issued to Piedmont:

- TSS Daily Max limit
- Monthly Average TSS limit
- Permit Condition (Potential Problem/Slug Discharge)
 - SUO Sections:
 - 8-2-54.1(A): Discharge of pollutant that caused interference
 - 8-2-54.12(1): Notification of accidental spill
 - 8-2-57.6(A): Slug load that may cause problems for POTW
 - 8-2-57.6(B): Failure to submit report within 5 days
- Required to modify SPCC plan with updated contacts & numbers
- Fined \$6,708.95
- SNC 1st half 2013 for causing interference

THE END 