



Impact of New Federal Air Emissions Requirements for Sewage Sludge Incinerators in New England

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October 12

Overview

- Key elements of Federal Plan
- Challenges
- Implementation – Synagro Woonsocket FBC



SYN

Federal Plan – 40 CFR Part 62 Subpart LLL

- Rule proposed under 40 CFR Part 60 Subparts M, MM, MMM and L, LL, LLL (2010)
- No NE states received SIP approval
- Federal Plan 40 CFR Part 62 Subpart LLL
 - Proposed 2015
 - Signed February 22, 2016
 - Not published in FR until April 29, 2016
- Compliance Date March 21, 2016
 - If not compliant or ceasing operations, notify EPA
 - Provide monthly progress reports

Guidelines & Federal Plan

- Regulatory Umbrella
- 40 CFR Part 60
 - New MHC (LLLL)
 - New FBC (LLLL)
- 40 CFR Part 60 & 62 (Federal Plan)
 - Existing MHC (MMMM, LLL)
 - Existing FBC (MMMM, LLL)
 - 5-yr lookback for existing units (trigger LLLL)
- If Hg control required (most FBCs) rule prescribes technology

Major Submittals (LLL)

- Title V operating permit (March 21, 2014)
- Petition for Alternatives
- Control Plan
- Site Specific Monitoring Plan
- Test Protocol & Operating Limits
- Initial AQCS inspections
- Operator Training
- Testing
- Initial Compliance Report (establishing OLs)

Major Submittals (LLL) – Control Plan

Document that describes the control strategy for regulated compounds 4-ele

1. Description of AQCS and modifications to meet standards.
2. Wastes processed (other than sludge)
3. Design capacity
4. Petition for site specific operating limits
 - Hg control
 - pressure drop
 - ash monitoring
 - sludge monitoring
 - pH
 - WESP water flow





SYN

Major Submittals (LLL) –Control Plan

■ Regulated compounds

- NO_x, CO, D/F – combustion control, FGR, RTO
- PM, Cd, Pb – Scrubbers & WESP
- SO₂, HCl – Scrubbers
- Hg – carbon based, sludge monitoring



Major Submittals (LLL) Site Specific Monitoring Plan

- For controls described in CP
 - Description of monitoring device
 - Specifications
 - Location
 - Calibration procedures
 - Maintenance
 - Ongoing performance evaluation



- Detailed description of plant operations including PFDs, ash handling etc.
- Description of WWTP

Major Submittals (LLL) – Test Protocol

- Typical EPA stack testing methodology
- Detailed description of facility
- Detailed description of operations during test
- Separate document outlining establishment of **Operating Limits**
 - Coordination between test team and plant operations
- Operation at 85% of permitted capacity
- Sludge sampling & feedrate monitoring (wet)
- Consider CEMS Pretesting



Major Submittals (LLL) - Test Protocol

Operating Limits:

- Most parameters 4-hr period, pH 1-hr
 - Limit will apply 365 days per year
 - Compliance based on 12-hr average, CEMS 24-hr, pH 3-hr
- Emissions tests typically 1 to 1.5 hrs
- Consideration of schedule for OLs & emissions



Major Submittals (LLL) Test Protocol Schedule

**TABLE 2 - PROPOSED TEST SCHEDULE
SUBPART LLL & RIDEM COMPLIANCE TEST**

**Woonsocket
FBC**

<u>TEST DAY</u>	<u>DATE</u>	<u>TEST METHODS</u>	<u>OPERATING PARAMETERS</u>
1	Tuesday AM	M-29 Metals (1X 2-hr run) M-5&8 PM & H ₂ SO ₄ (1X 84-min runs) M-6C SO ₂ (1X 1-hr runs) M-26A HCl (1X 84-min runs)	4-hour monitoring of all venturi, tray, WESP parameters; pH, sludge feed rate

Compliance Reports

- Initial - 60 days following performance test:
 - Certification of accuracy of report
 - Test report demonstrating compliance with emission limits
 - Site Specific Operating Limits
 - Initial AQCS inspection
- 6-month deviation reports
- Annual 12 months from Initial Compliance Report
 - Same as Initial +
 - Range of operating parameter values
 - Test results



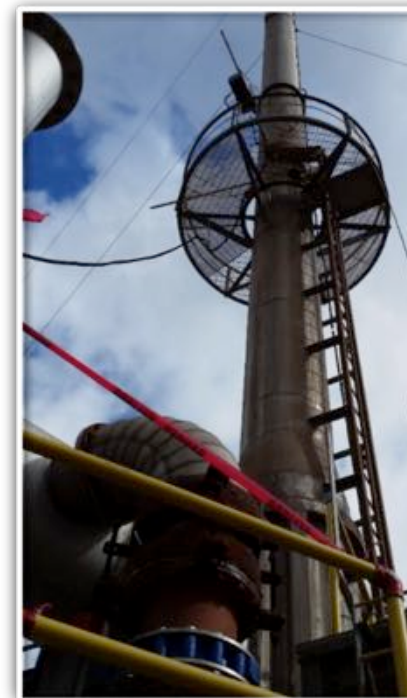
Synagro Woonsocket Facility Hg Control



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Woonsocket Facility Characteristics

- 125 dtpd fluidized bed thermal processing
- On Line 2007 replacing MHC, serves as regional facility
- Receives biosolids in liquid and cake form (~50:50)
- Approximately 30 customers
- Added 1.7 MW HRSG in 2013
- AQCS consisting of venturi, tray scrubber & WESP
- Added Hg control in spring 2016



Woonsocket Hg Control

Woodard & Curran – Permitting / DB / startup / commissioning

Design considerations

- Hg FBC standard 0.037mg dscm @7% O₂
- Woonsocket data
 - Emission test ~0.09mg dscm @7% O₂
 - Variable Hg concentration in sludge (~0.5 – 2 mg kg)
 - Historical trend

HRSG & ID fan balance

Location – platform required

Relocation of 25,000 acfm odor scrubber

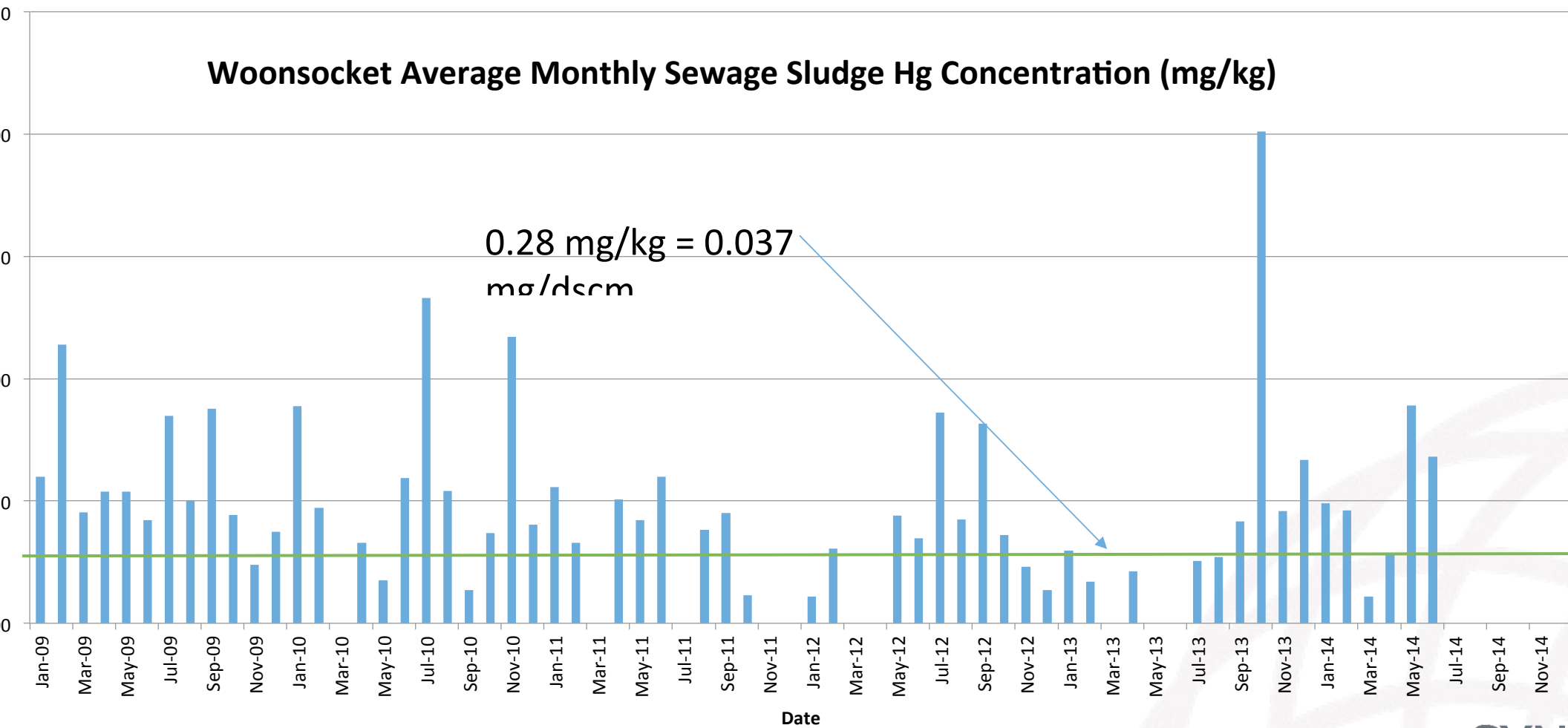
Maintain access to loading dock

Major WWTP construction project



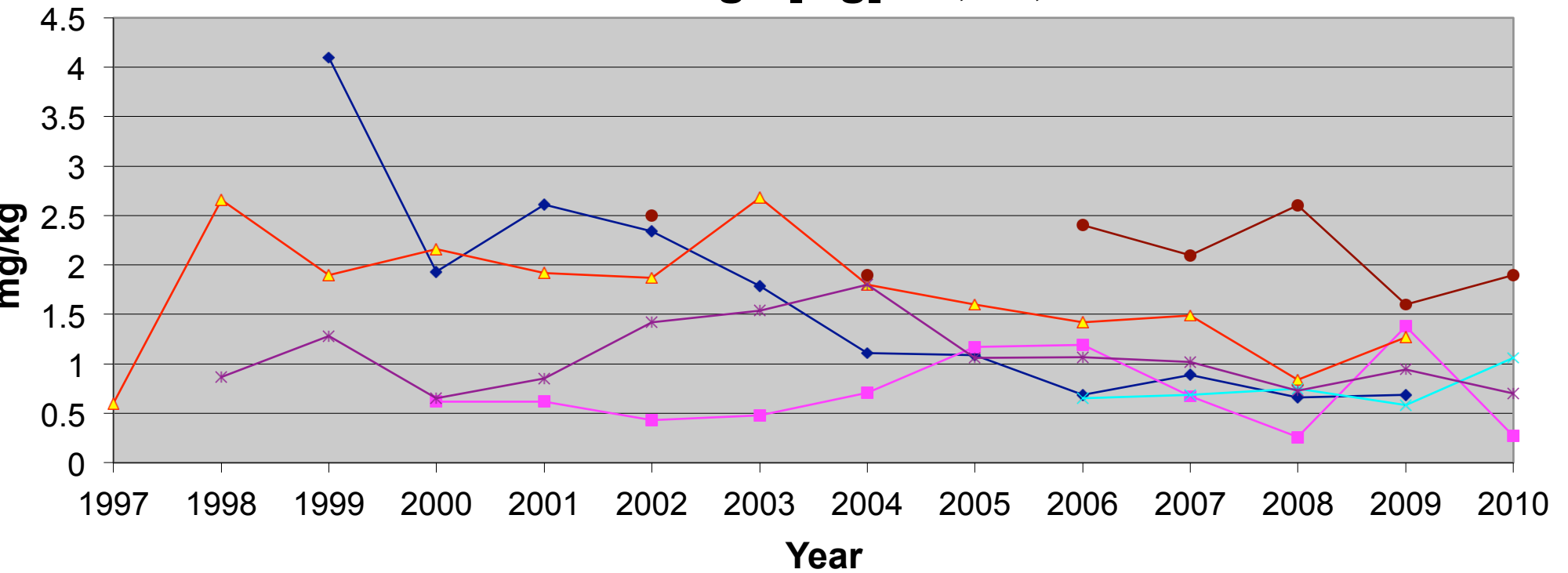
Calculation of [Hg Stack] Basis of Design

Woonsocket Average Monthly Sewage Sludge Hg Concentration (mg/kg)



Regional Trend in Hg sludge Concentrations

Historical Sludge [Hg] CT, RI, NY



Sludge Variability



Hg AQCS

Selected vendor of carbon based system

Vendor unable to guarantee delivery

Selected APC to provide technology based on Woodard & Curran design basis.

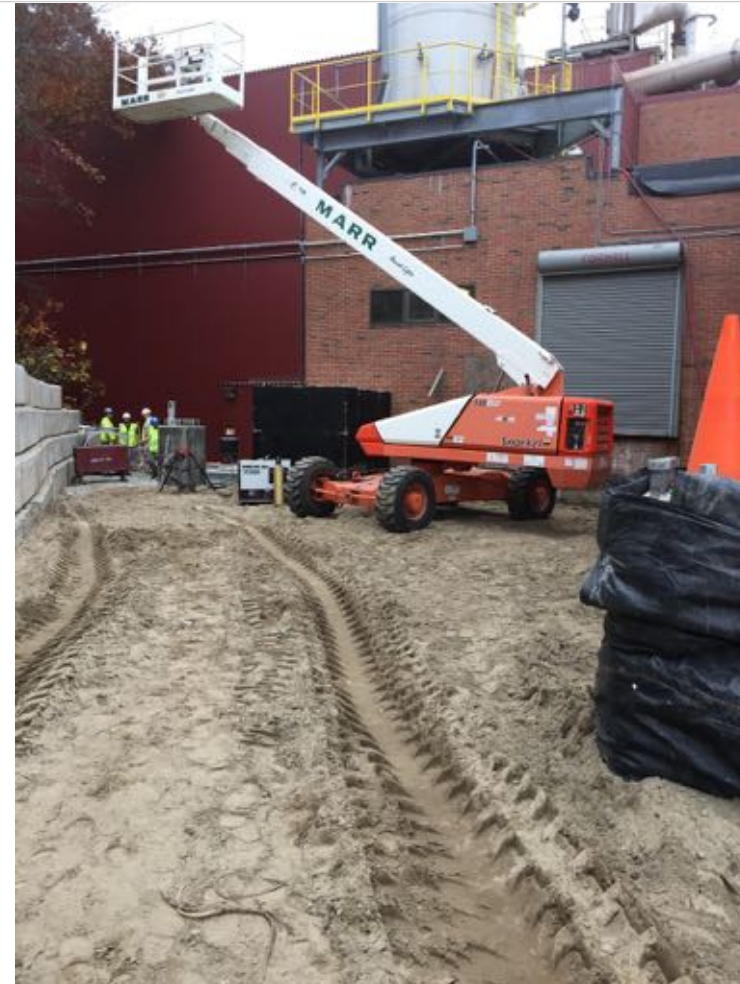
- Re-heat system (NG)
- Pre-filter (roll)
- 4-Vessel carbon based system

- Incorporated FBC Waste heat to offset natural gas use

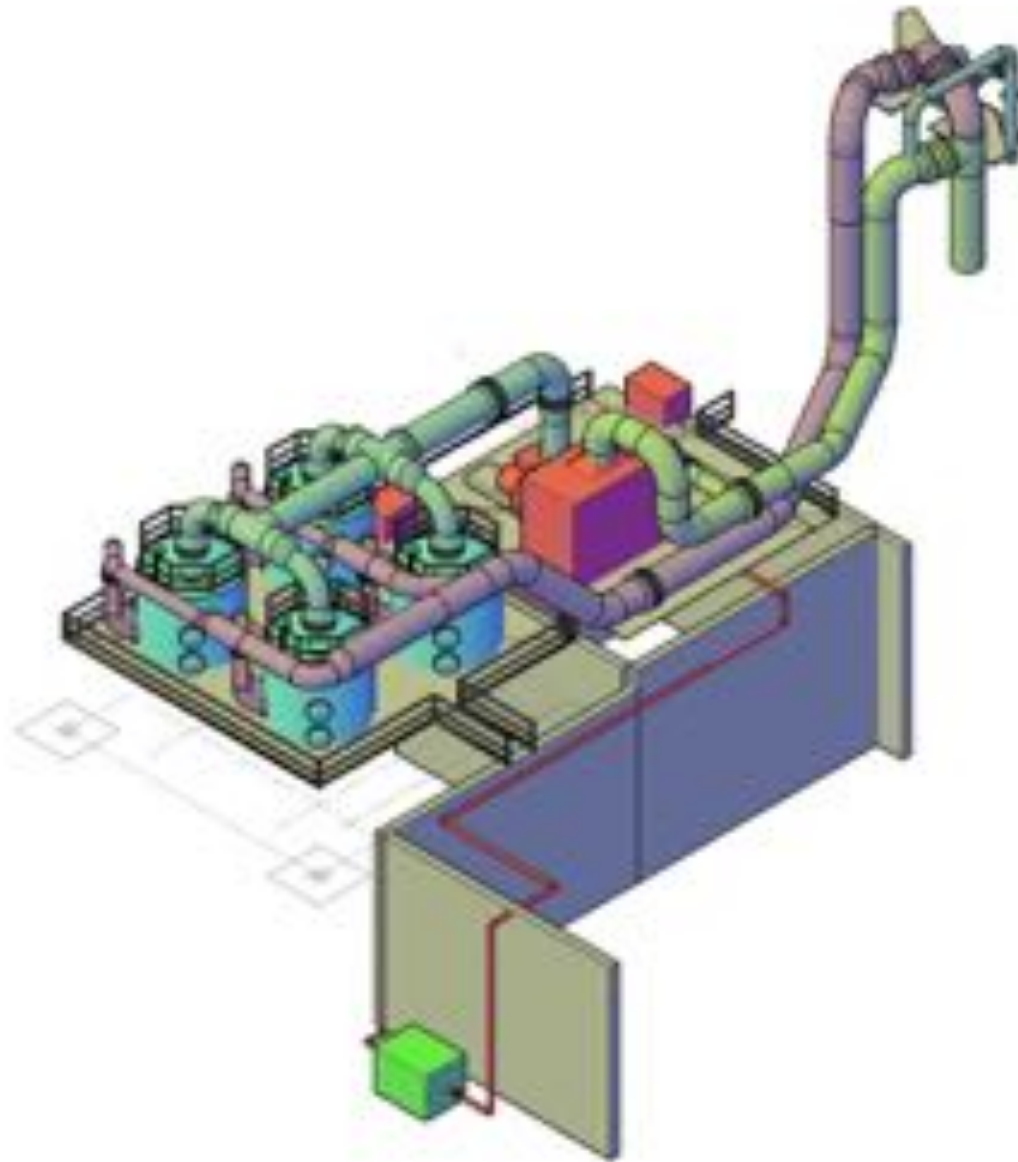


Complicating Factors

- Relocation of return flow piping
- Relocation of communications cable
- Excavation of hillside
- Elevated platform (space limitations)
- Relocation of 25,000 acfm odor scrubber
- Exhaust flow balancing
- Relocation of NG Service
- Etc!



Synagro Woonsocket Hg Control System



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Woonsocket Hg Control





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NG Fired Preheater



Woonsocket FBC Construction



Questions

Thank You

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