



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

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#### Dverview

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



### ederal Plan – 40 CFR Part 62 Subpart LLL

- Rule proposed under 40 CFR Part 60 Subparts MMMM and LLLL (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









## Aajor Submittals (LLL) –Control Plan

- Regulated compounds
  - NO<sub>x</sub>, CO, D/F combustion control, FGR, RTO
  - PM, Cd, Pb Scrubbers & WESP
  - SO<sub>2</sub>, HCI 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

### Aajor 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</u> DAY	DATE	TEST METHODS	OPERATING PARAMETERS
1	Tuesday AM	M-29 Metals (1X 2-hr run) M-5&8 PM & H <sub>2</sub> SO <sub>4</sub> (1X 84-min runs) M-6C SO <sub>2</sub> (1X 1-hr runs) M-26A HCI (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





#### **Noonsocket 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



#### **Voonsocket 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  $@7\% O_2$
    - 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



### Regional Trend in Hg sludge Concentrations



# Sludge Variability





### lg 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



#### **Voonsocket Hg Control**







### **NG Fired Preheater**



#### **Voonsocket FBC Construction**



#### Questions

Thank You

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