NoxTech Project Status Update

Biogas Technology Advisory Committee
Working Group Meeting
Wednesday, October 29, 2014

Mark E. Iverson, P.E.
Director of Maintenance
NoxTech at the Mills Pump Station
NoxTech at Temecula Valley RWRF
TVRWRF NoxTech

- **TVRWRF Similar to Woodville and Mills Installations**
  - Two Lean Burn Engines (530 HP Each)

- **Digester Gas Similar to Landfill Gas**
  - Low BTU
  - High Moisture Content

- **Blend Use of Digester Gas and Natural Gas**
  - Digester Gas Production Varies

- **Digester Gas added at Burner and Add Fuel**
  - Needed in Natural Gas Use
**NOxTech Process**

- **EGR Heat Exchanger / Blower System**
- **Swirl Vanes**
- **Reactor Heat Exchanger**
- **Reactor Core**
- **Burner**
- **End Plenum**
- **Inlet Plenum**
- **Stack**
- **Engine Exhaust**

**Flow Details:**

- **Start Up Burner**
- **Add Fuel Injectors**
- **Urea Injectors**

**Economizer:**
- Pre-Heating of Engine Exhaust & Heat Recovery from Reactor Core

**Mixing:**
- Mixing of Engine Exhaust, Add Fuel, and Urea. Formation of Free Radicals

**Temperature Points:**
- ~1,000 Deg F
- ~1,480 Deg F
- ~1,280 Deg F

**Process Stages:**
- Mixing of Engine Exhaust, Add Fuel, and Urea. Formation of Free Radicals
- **Economizer:** Pre-Heating of Engine Exhaust & Heat Recovery from Reactor Core
- **Inlet Plenum**
- **B Burner End Plenum**
- **Urea Injectors**
- **Add Fuel Injectors**
- **Digester Gas**

**Engine Exhaust Flow**
- **NoxTech Exhaust**
- **EGR Heat Exchanger / Blower System**
- **Engine Exhaust IN**
- **Reactor Heat Exchanger**
- **Reactor Core**
- **Burner**
- **End Plenum**
- **Inlet Plenum**
- **Stack**
- **Exhaust Gas**
TVRWRF NoxTech - Digester Gas Results

TVRWRF NOxTech Data
Blower #1 Test Runs: 10/6/14 thru 10/8/14

- CO limit – 250ppmc

- NOx limit = 11 ppmc

- Warmup period

Graph showing pollutant concentration over time from 10/6/2014 to 10/8/2014.
TVRWRF NoxTech Testing Results
Oct 21 Through 26 2014

NOx Analyzer Problems

CO Limit 250 ppm

NOx Limit 11 ppm

NOx Analyzer Problems
TVRWRF NoxTech Testing Results
Oct 25 2014

CO ppm (Corrected)
NOx ppm (Corrected)

CO Limit 250 ppm
NOx Limit 11 ppm

NOx Limit 11 ppm

CO Limit 250 ppm
TWRVRF NoxTech Issues

- **Start-Up**
  - Time to Meet Emission Requirement

- **Transitions of Fuel Blends**
  - Emission Excursions During Fuel Blend Changes

- **Siloxane Exhaust Build-up**
  - Possible Plugging of Continuous Monitors
EMWD Next Steps

Site Differences

TVRWRF NoxTech

- Research and Development Stage: Oct 2014
- Pilot Demonstration: 6 months
- Result Evaluation: (?)

EMWD

- Other Projects
  - Moreno Valley RWRF Tecogen Biogas Project
  - San Jacinto Valley RWRF Biogas
Contact Information

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