Air Quality Permitting
Waste-to-Fuels Projects
Greg Wolffe, C.P.P.
GWolffe@YorkeEngr.com

Yorke Engineering, LLC
www.YorkeEngr.com
Office Locations: Los Angeles, Orange County, Riverside, Ventura, Fresno, Berkeley
Tel: (949) 248-8490 ▼ Fax: (949) 248-8499
Yorke Permitting Experience

- Landfill Gas-to-Power
- Waste Organic Liquids-to-Ethanol Fuel Processing
- Sewage Digester Gas-to-Power
- Wood Waste-to-Power
- Onion Waste-to-Power
- New, Emerging Technologies, e.g., Pyrolysis
The Keys to AQ Permitting

- What Are the Critical Requirements to Tackle?
- Resolving the Issues
- Case Studies
To Permit New Equipment in Non-Attainment Areas, Consider:

- Type of Emissions – VOCs, NO\textsubscript{x}, SO\textsubscript{x}, toxics, etc. (stack and fugitive);
- Compliance with Existing Rules/Regulations; and
- New Source Review – the Federal Standards for New Equipment
Compliance with Existing Rules and Regulations

- New or Modified Equipment must meet:
  - Local Air District Rules and Regulations;
  - Air Toxic Health Risk Requirements; and
  - Federal Standards (NESHAPs and NSPS)

- New Source Review requires:
  - Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER);
  - Offsets for the New Air Emissions; and
  - Air Quality Impact Demonstration (Modeling)
Each Region Is Classified for AQ

- NSR Applies to Non-Attainment Pollutants, Depending on Location:
  - Ozone (NO\textsubscript{x}, VOCs)
  - NO\textsubscript{x}
  - SO\textsubscript{x}
  - CO
  - PM\textsubscript{10}
  - PM\textsubscript{2.5}
Emissions Controls

- Most large projects will require BACT or LAER
- For example:
  - For NO$_x$ – Selective Catalytic Reduction (including gas cleanup, if needed)
  - For VOCs – Regenerative Thermal Oxidizer (RTO)
  - For Organic Toxics – RTO or Catalytic Oxidation
  - For Particulates (including metals) – Baghouse
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Plan and Design for AQ Issues

- Identify the Federal, State, and Local Requirements up front
- Quantify the projected pollutants and emissions, including fugitives, toxics, and odorous compounds
- Identify the Lowest Emissions Technology and get guarantees
- Build compliance into the project and be prepared for Public Notice
Before Submitting an Application

- Ensure that compliance with all requirements is incorporated in the design;
- Provide only accurate data and information in the application;
- Present basis of emissions data clearly – e.g., guaranteed, estimated, etc.; and
- Be prepared to adjust the design based on agency inputs
Beware!

- Wait for the Permit to Construct before purchasing equipment or starting construction;
- Don’t over-promise performance or underestimate potential emissions – these may become permit limits/conditions; and
- Work with agencies carefully on permit conditions – understand the requirements!
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Orange County Landfill

- Orange County Waste & Recycling
- Combined-Cycle Biogas Technology
  - Landfill Gas
  - 32 MW Electricity Generation (Renewable PPA)
- Equipment Description
  - LFG Pre-Treatment System with Regenerative Flare
  - Four (4) SolarTurbine Generators
  - 4-on-1 Steam Drum and Turbine
- Oxidation Catalyst; SCR
MSW Anaerobic Digestion

- Air Permitting Agency: SCAQMD
- Anaerobic Digestion of Greenwaste
  - “Digestate” Composted for Soil Amendment
  - Renewable CNG for Waste Collection Trucks
- Permitted Equipment Includes:
  - Digesters
  - Gas Purification Equipment
  - Flare
  - Biofilter
Hyperion Treatment Plant
Digester Gas Utilization Project

- City of Los Angeles
- Process Description
  - Digester Gas and Natural Gas
  - Electricity with Cogeneration of Heat
- What Is Permitted
  - Fuel Gas Treatment System
  - Combustion Turbine Generators (3)
  - Thermal Oxidizers
  - Black-Start Generator
- Control Device
  - Selective Catalytic Reduction System
  - Oxidation Catalyst
Delta Diablo Sanitation District
East County Bioenergy Project

- BAAQMD Alternative Technology Review and Permitting Feasibility Study
- Potential Fuels = 64 TPD Biosolids, Wood Waste, and Food Waste
- Permitting Issues
  - Gasification ≠ Combustion (or Incineration)
  - Few Operating Installations, So Limited Data
  - Syngas (from Gasifier) Is Different Than NG or Landfill Gas
  - BACT Needed for NOx, SOx, and PM
Conclusion – Permitting Can Be Done!

- Despite having to overcome regulatory requirements, air quality permitting for projects is possible.
- Waste-to-energy projects can be advantageous in both environmental and monetary terms.
- In 2009, an onion processing facility expected its $9.5 million system to pay for itself within 6 years, while eliminating 30,000 tons of carbon dioxide-equivalent emissions a year.