FC Landfill Energy, LLC

A project to design, construct, own, operate and maintain a 2.1 megawatt landfill gas to energy facility located at Reichs Ford Sanitary Landfill in Frederick County, Maryland
Reichs Ford Road Sanitary Landfill

- Began accepting waste in 1969
- 530-acre site with a design capacity in excess of 2.75 million tons of MSW over two sites
  - Site A – closed and capped, with an LFG collection and control system installed in 1998
  - Site B – currently open and expected to meet the County’s disposal needs through 2045
- Two previous attempts to build/operate a landfill gas to energy (LFGTE) project were unsuccessful
Construction

Site B Vertical Expansion airspace and 28 wells
Design, Construction: Lessons Learned

- As built drawings, periodic aerial surveys help locate
  - Liner limits, waste depths
  - Leachate collection system
    - Laterals, headers
    - Trenches
    - Cleanouts
- Integrate 12 year old Site A LFGCC
  - 72 extraction wells in good condition, were balanced in-house
  - Blowers, flare – upgrades were necessary
Landfill Gas Project History

- Apr. 1997 – Letter from DPW Director: EPA’s preliminary results find Reichs Ford promising candidate for LFGTE
  - Could generate 2.2 MW of electricity
- Dec. 1998 – Site A’s LFG system in place
  - Actual construction cost = ~$1M; Annual O&M = <$5K; no revenue
- Aug. 1999 – County issued RFP for Feasibility Assessment for LFGTE
  - Evaluate the generation and recovery potential
  - Potential end uses
  - Approximate costs
Landfill Gas Project History

- **Jul. 2001 – Final Report**
  - Identified 3 nearby gas end users/sales
  - Electricity generation up to 3Mw, local utility could be purchaser
  - On-site use – gas up to $13K/Yr, electric up to $75K/Yr
  - Green power, greenhouses

- **Jul. 2001 – Summary of Findings: Reichs Ford good LFGTE candidate**

- **Dec. 2001 – Attended LMOP Conference; solicited expressions of interest from attendees**

- **Jan. - Jul. 2002 – Received 16 responses**

- **Oct. 2002 – Drafted RFP for internal review**

- **Project put “on hold” – a low priority**
Landfill Gas Project History

- Nov. 2003 – County issued RFP for design/build services
- Jan. 2004 – Technical Proposals opened and selection made
- Apr. 2005 – First design progress meeting
- Sept. 2005 – Contractor walks away from negotiations
- Feb. 2007 – Curtis Engine, a contractor partner, planned to pick up contract but waits for another RFP to be issued
- Sept. 2007 – Northeast Maryland Waste Disposal Authority issues RFP for development, ownership, operations, and purchase; no award
- 2008 – Northeast Maryland Waste Disposal Authority issues another RFP for development, ownership, operations, and purchase
- March 2008 – Northeast Maryland Waste Disposal Authority initiates Interconnection Study
- Feb. 2009 – FC Landfill Energy, LLC awarded contract
Project Team

- Frederick County Division of Utilities & Solid Waste Management – owner/operator of Reichs Ford Sanitary Landfill
- Northeast Maryland Waste Disposal Authority – joint project sponsor with Frederick County – procurement and contract administration
- Energenic, LLC – Sole owner of FC Landfill Energy, LLC
- FC Landfill Energy, LLC – special purpose company created to own and operate energy generating facility
  - Energenic, LLC – Project Developer, Project Manager
  - EA Engineering, Science, and Technology, Inc. – environmental permitting
  - South Jersey Energy Solutions, LLC – power and environmental attribute marketing
  - DCO Energy, LLC – EPC/O&M contractor
    - Industry and Energy Associates, LLC (now part of Stantec) – civil, structural, mechanical, electrical and control design
    - EA Engineering, Science, and Technology, Inc. – gas collection system design
Contract Details and Project Specifications

● **FC Landfill Energy, LLC**
  - Wholly owned subsidiary of Energenic, LLC, a partnership between long-term business partners South Jersey Energy Solutions, LLC and DCO Energy, LLC

● **Major Design/Build Elements**
  - New LFG collection system for uncapped and active Area B
  - Integration of the new Area B collection system with the existing Area A system and flare
  - Upgrades to existing flare system
  - New LFG conditioning systems and blowers
  - Two containerized reciprocating internal combustion engine-driven generators
    - Equipped with exhaust silencers and housed in sound-absorbing enclosures to suppress noise propagation beyond the fence line
  - Power transformation equipment and utility interconnection
Project Permitting

- **Site development permitting**
  - Frederick County Site Plan Approval andStormwater Approval
  - Catoctin and Frederick Soil Conservation District (E&S) Approval

- **EA anticipated a new Site Plan would not be required for the project and it would be covered under the existing Plan**

- **County Planning and Zoning determined part of the project covered under existing Plan and part required a new Site Plan – development/approval required 3-4 months**

- **Lessons learned**
  - Meet with permitting staff earlier in the project process
  - Ask for written concurrence of permitting pathway
  - Communicate with all stakeholders frequently
Permit Summary

● County
  ▪ Site Plan, Forest Resource and Adequate Public Facility Ordinance
  ▪ Site Improvement Plans, Zoning/Landuse
  ▪ SWM Plans, Easements
  ▪ Grading Permit, Soil Conservation
  ▪ Building Permits (Electric, Mechanical, Plumbing)

● State, Federal
  ▪ Permit to Construct – Flare, Engines
  ▪ Operating Permits – Title V, Refuse Disposal
  ▪ Green House Gas Reporting
Overview of Project Timeline

- **Feb. 2009** – Construction, Operations & Maintenance Agreement Executed
- **May 2009** – MDE Permit Application
- **Design of collection system (EA Engineering, Science, and Technology) and electrical generation equipment (DCO) occurred in parallel**
- **Jan. 2010** – All Permits Approved; Start of Construction Activities
- **Mar. 2010** – Completion of Well Field Construction
- **Apr. 2010** – Substantial Completion
- **May 2010** – Commercial Operations
- **Aug. 2010** – Final Completion
Operations Begin

- May 31, 2010 – Operations began
- Sept. 9, 2010 – Frederick County Commissioners, the Maryland Energy Administration and the EPA recognized the plant
Current Operations

- Since Commercial Operation in May 2010 till Dec 2010:
  - Total Generated Electricity: 9,830,215 kW
  - Plant Availability: 91.8%
  - Total Landfill Gas Utilized: 258,996,689 ft³
Key Project Aspects

- Successful team effort between developer, the Authority, and the County
- Early initiation of the Interconnection Study by the Northeast Maryland Waste Disposal Authority
- Land GEM models created by Energenic during development phase meet the gas demands of engines
- Gas conditioning designed to remove moisture and particle contaminants and chill the LFG before entering engines
- Controls interface with landfill’s existing LFG collection and flare system
- High plant availability
  - Well-field balancing at startup
  - Remote monitoring and data storage capabilities
Questions ????