



# WCA & Fort Bend Power Producers: Generating High BTU Gas from Landfill Gas in Texas

WCA's Ft Bend Regional Landfill  
Needville, TX

*Presentation By:* Larry Cohn, PE, Region Engineer-WCA  
Bill Brinker – Ft Bend Power Producers,

*July 16, 2013*

# Quick Project Overview:

---

- ***Project Owner:*** Fort Bend Power Producers, LLC (FBPP)
- ***Landfill Owner:*** Waste Corporation of Texas, LLC (WCA)
- ***Location:*** Fort Bend Regional Landfill – 14115 Davis Estate Rd,  
Needville, TX 77461
- ***Developer:*** Enerdyne Power Systems, Inc. & Morrow Renewables
- ***Major Partners Involved:*** WCA, GHI Energy, Morrow Renewables,  
Enerdyne Power Systems, Advance One Development, GC  
Environmental, SCS Engineers & Field Services, TCEQ, & Fort Bend  
County.
- ***Output:*** 5500 scfm Designed Plant with anticipated growth
- ***Fuel:*** Landfill Gas
- ***Treatment:*** Selexol

# Overview Continued:

---

- ***Expected Life:*** 30+ years
- ***Operational As Of:*** June, 2013
- ***Gas Offtake Agreement:*** GHI Energy
- ***Renewable Identification Numbers (RINs):*** Sold to GHI

# Ft Bend Power Producers, LLC

&

# WCA



# Fort Bend MSW Landfill

---

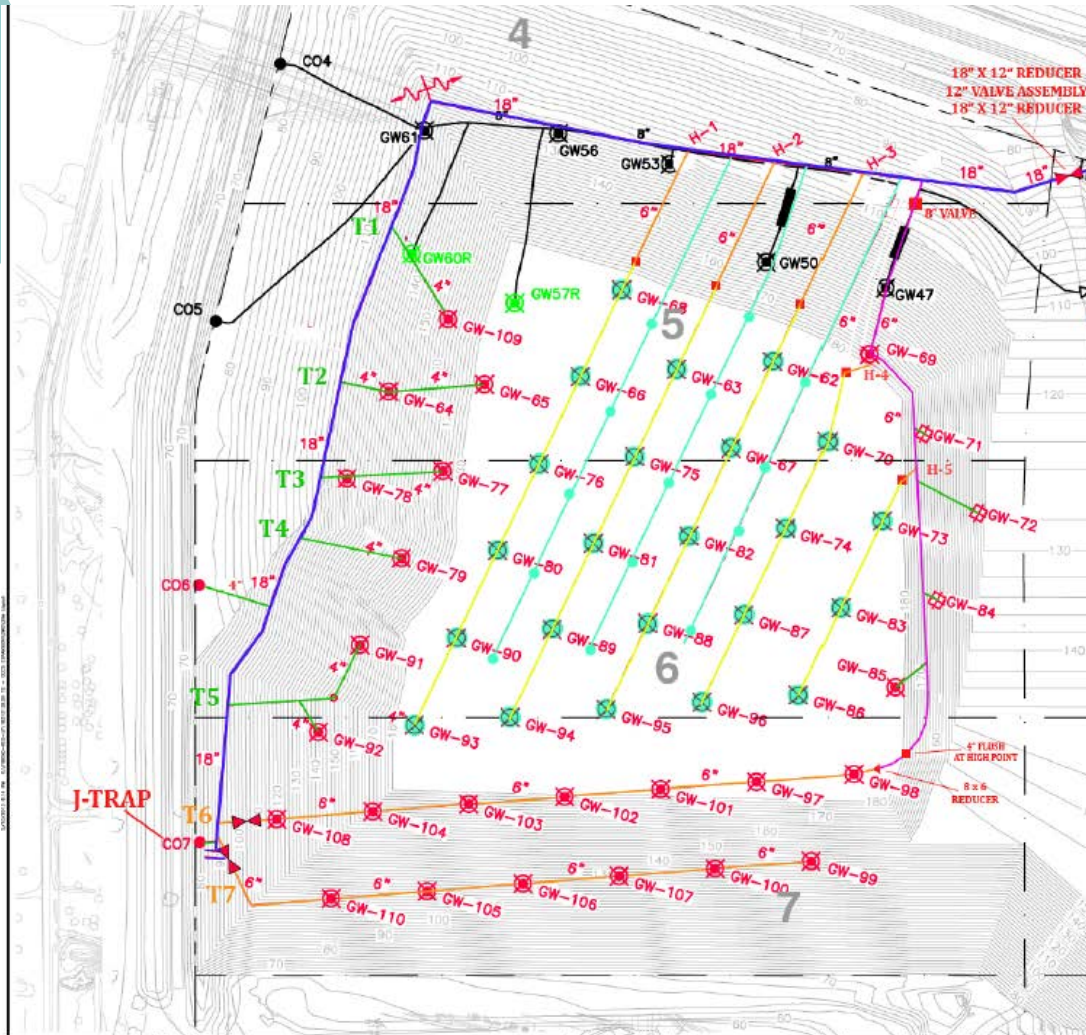
- Site Opened in 2004
- Site takes approx. 3000/tpd of MSW, currently
- Approx. 7,000,000 Tons in Place
- GCCS:
  - 102 Collection Points
    - 53 original wells in 2011
    - 49 additional wells in 2013
  - 1100+ scfm, current.
  - Expect to be 1600-1800 scfm by August, 2013
- WCA wanted to do more than just 'flare the gas' – they wanted to use it!
- To be Proactive – Future...



# GCCS – Pics



# 2013 GCCS Expansion



### LEGEND

- EXISTING CONTOURS
- EXISTING HEADER/LATERAL PIPE
- EXISTING VERTICAL EXTRACTION WELL
- EXISTING VERTICAL REVERSE WELL
- EXISTING CLEANOUT RISER
- EXISTING ROAD CROSSING
- EXISTING ISOLATION VALVE
- EXISTING BLIND FLANGE
- EXISTING CONDENSATE SUMP
- EXISTING HIGH POINT
- PROPOSED HEADER/LATERAL PIPE
- 2" LEACHATE/CONDENSATE RECIRCULATION LINES
- HORIZONTAL COLLECTOR
- PROPOSED VERTICAL EXTRACTION WELL
- PROPOSED VERTICAL DOWNSLOPE WELL
- PROPOSED CHIMNEY WELL
- PROPOSED HORIZONTAL WELL-HEAD
- REDESIGNED EXTRACTION WELL
- PROPOSED CLEANOUT RISER
- PROPOSED ISOLATION VALVE
- PROPOSED BLIND FLANGE
- PROPOSED HIGH POINT
- CELL NUMBER

### NOTES:

1. TOPOGRAPHIC MAPPING WAS COMPILED USING PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY ON JANUARY 16, 2012. CHANGES WERE ADDED TO THIS DRAWING PER DISCUSSION WITH THE SITE MANAGER IN ORDER TO SIMULATE GRADES THAT WILL BE PRESENT IN MID-2013 DURING CONSTRUCTION. AS SUCH, ALL GRADES MUST BE RE-VERIFIED IMMEDIATELY PRIOR TO CONSTRUCTION.
2. SLOPES OF HEADER LINES MUST BE A MINIMUM OF 3% INSIDE WASTE AND 1% OUTSIDE OF WASTE AND MUST DRAIN TO A CONDENSATE SUMP. LATERALS MUST HAVE A MINIMUM SLOPE OF 2% AND DRAIN TO A HEADER PIPE. FIELD ADJUSTMENTS MAY BE NEEDED TO THE DESIGN SHOWN HERE BASED ON FIELD GRADES TO ACHIEVE THE REQUIRED SLOPE.
3. PIPE SIZES SHOWN ON THIS DRAWING ARE MINIMUMS.
4. 2-INCH AIR AND CONDENSATE LINES TO BE EXTENDED ALONG ALL 18-INCH PERIMETER HEADERS.

	DATE	DESCRIPTION
<b>PROJECT TITLE</b>		
LFG COLLECTION SYSTEM LAYOUT PLAN		
GCCS EXPANSION		
FORT BEND REGIONAL LANDFILL		
<b>CLIENT</b>		
ENERGY POWER SYSTEMS INC. 16801 MONROE ROAD SUITE F MATTHEWS, NORTH CAROLINA 28105		
<b>CLIENT ADDRESS</b>		
16801 MONROE ROAD SUITE F MATTHEWS, NORTH CAROLINA 28105		
<b>CLIENT PHONE</b>		
(704) 851-1111		
<b>CLIENT FAX</b>		
(704) 851-1111		
<b>CLIENT EMAIL</b>		
info@epsinc.com		
<b>CLIENT WEBSITE</b>		
www.epsinc.com		
<b>CLIENT LOGO</b>		
<b>CLIENT PROJECT NUMBER</b>		
EPS-13-001		
<b>CLIENT PROJECT NAME</b>		
GCCS EXPANSION		
<b>CLIENT PROJECT LOCATION</b>		
FORT BEND REGIONAL LANDFILL		
<b>CLIENT PROJECT DATE</b>		
01/2013		
<b>CLIENT PROJECT SCALE</b>		
AS SHOWN		
<b>CLIENT PROJECT DRAWING NO.</b>		
1		





# Permitting

---

- GCCS
- Type IX
- Local Building Permits



# Project Sizing / Development Approach

---

- Gas Curve
- End-Use Options
- Power, Direct Use, High BTU
- Life Expectancy of LF/End Use

## Key Items:

1. Landfill
2. End-User
3. Permit
4. Money
5. Knowledge / Patience



# Project Challenges

---

- Pipeline Interconnection/Spec
- Changing Regulations/Legislation
- Off-Take
- ROW
- Utility Power

# Preparation



# Utility – Upgrade Incoming Service

---

- The Project Consumes Approx. 1MW of power to run @ full load.





# Equipment:

---

- PD Blower
- Gas Cooling
- Reciprocating Compression
- Pre-Treatment
- Incineration of Pre-Treatment Reject
- CO<sub>2</sub> Treatment with Physical Solvent
- Oxygen Removal
- Glycol Dehydration

# Plant Operation:

- 24/7 Operation
- 95% + online time @ full capacity
- 5 MW Equiv.
- 3 full time technicians









# Benefits to the Landfill Owner

---

WCA will receive several benefits over the life of this project...

A few include:

- Revenue from gas payments
- A Clean/Green Image.
- Avoided Costs - FBPP will operate and manage the project at **no** cost to WCA.
  - Including capital improvements to the well-field and equipment,
  - general well-field O&M,
  - and all associated responsibilities to the end-use project.

# Environmental Benefits

---



Produces enough power/fuel for about 5000 homes!

The **Annual Reduction** of GHG attributable to this project is approximately the same as the annual GHG emissions of:

- More than **7,400** passenger cars
- Carbon Dioxide emissions from **85,000** barrels of oil
- Carbon sequestered by **8,000** acres of pine forest!



# Project Costs & Financing

---

- \$9.2 Million Total Project Value – partial equity and partial bank debt for:
  - Pipeline Tap & Meter
  - Easements & Pipeline
  - Permits, Design, Engineering, etc.
  - Site Work
  - Blower-Flare
  - Office Building/Maintenance Shop
  - Gas Treatment
  - Interconnection
  - Transformers
  - GCCS
  - Installation & miscellaneous items



# Tax Credits

---

- High BTU projects currently do not qualify for Any Tax Credits!
- Push your representatives to support these projects!

# Overall Plant

---



# Compression – 1<sup>st</sup> Stage

---



# Compression – 2<sup>nd</sup>/3<sup>rd</sup> Stage

---





# Dehydration

---



# Dehydration, 2

---



# Gas Cooler

---



# Incinerator

---



# O<sub>2</sub> Removal

---



# Pre-Treatment & Stripper

---



# Pre-Treatment Pump & Cooler

---



# Blower

---





# CO2 Removal

---



# CO2 Removal

---





# Moving Forward...

---

- If you have a landfill, public or private...
- Use this project and others that have been done as an example...
- LFG projects from medium BTU to high BTU, power, or simply flaring are **POSTIVE** and beneficial in a number of ways.
- Act ahead of the cure...
- **TAKE ACTION!**
- **ACT NOW!**
- Everyday without a project is a day of lost revenue and it causes undo harm our environment!



Advance ONE Development, LLC



**GHI ENERGY**<sup>™</sup>  
BIOFUELS & RENEWABLES



**SCS ENGINEERS**