LOUISIANA GEOTHERMAL

Recovery Act: Demonstrating The Commercial Feasibility Of Geopressured-Geothermal Power Generation At Sweet Lake Field, Cameron Parish, Louisiana

May 19, 2010

PI: Steven M. Jordan

Presenter: Phillip A. Gayle, Jr.

Louisiana Tank, Inc.

Company Background, Experience & Skills:

I.Louisiana Tank, Inc.

A. Founded in 1974
B. Oilfield service company specializing in the transportation and disposal of non-hazardous E&P waste
C. Operate state-of-the-art Class II commercial disposal facilities which utilize three commercial injection wells to dispose of E&P waste
D. Expertise from operation of commercial injection wells key to success in geopressured-geothermal drilling operations

II.Jordan Oil Company, Inc.

A. Sister company of Louisiana Tank, specializing in oil & gas exploration and production
B. Experience drilling over 100 wells, many in deep, high-pressured environments throughout the Louisiana Gulf Coast

Sweet Lake Geopressured-Geothermal Project

Cameron Parish, LA

Project Overview:

I. **Timeline**
   I. Award Selection: October 29, 2009
   II. Project Start Date: January 29, 2010
   III. Projected Completion Date: December 31, 2012

II. **Budget**
   I. Total Project Cost: $15,553,250*
   II. DOE Funding Amount: $5,000,000
   III. Recipient Cost Share: $10,553,250 (67.9%)
   IV. Phase C1 Budget Allocation: $1,306,975
   V. Total Expenditures (as of 04/2009): $879,326
      I. DOE Share: $232,767
      II. LA Tank Share: $646,559
   VI. Phase C1 Expenditures (as of 04/2009): 17.8%
   VII. Total DOE Award Expenditures (as of 04/2009): 4.6%

*Note: No Drilling Costs Included in Total Project Cost

Project Overview:

I.Barriers

I.Discussed on Slide 12 – “Market Outlook / Future Challenges”

II.Partners

I.Louisiana Geologic Survey / Louisiana State University (Sub-Awardee)

II.Industry Leading Reservoir Engineering Firm

III.Industry Leading EPC Contractor & Consultant

IV.Industry Leading E&P Service Companies

Project Objectives:

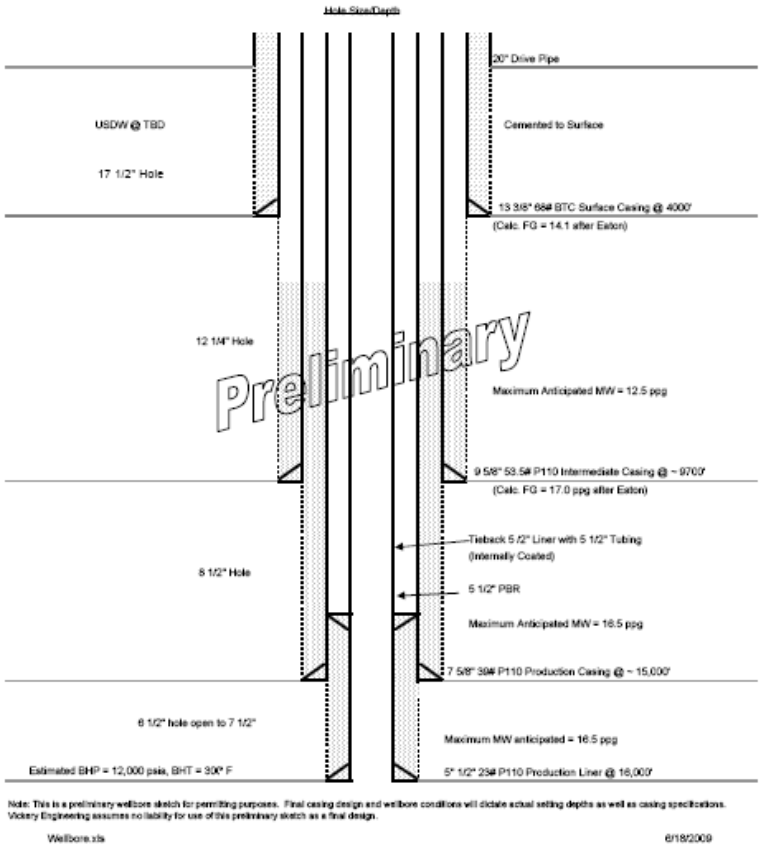
- Extensive conceptual and numerical modeling of the reservoir to quantify the reservoir characteristics, using a wealth of information from oil & gas wells in the area, including log, core, PVT and flow test data
  - Hired Geothermex, Inc. to assist in reservoir engineering & analysis

Table 1. Anticipated Reservoir and Fluid Characteristics			
Top of Geopressured Zone:	9,700 ft	Brine Density:	64.3 lbs/cubic ft
Reservoir Depth:	Less than 16,000 ft	Brine Compressibility:	3×10^{-6} psi^{-1}
Reservoir Pressure:	12,000 psia at 16,000 ft	Brine Formation Vol. Factor:	1.035
Reservoir Temperature:	300°F	Brine Viscosity:	0.386 cp
Reservoir Thickness:	Greater than 100 ft	Dissolved Gas Content:	10 to 30 scf/bbl
Reservoir Porosity:	0.22	Gas Gravity:	0.64
Reservoir Permeability:	260 md	Methane Content in Gas:	90 mol%
Reservoir kh:	Greater than 26,000 md-ft	Ethane Content in Gas:	1.6 mol%
Reservoir Storage Capacity:	0.0002 ft/psi	Propane Content in Gas:	0.3 mol%
Wellbore skin Factor:	0	CO_2 Content in Gas:	8.5 mol%
Brine Salinity:	Less than 130,000 ppm	H_2S Content in Gas:	20 PPMV

Project Objectives:

- **Well Design:**

  Specific to the conditions anticipated for geopressured reservoir (16,000 ft. well; 5 ½" Production Tubing)



Project Objectives:

- **FEED (Front End Engineering & Design):** Design surface facilities based on anticipated reservoir characteristics to optimize production of electricity from heat, kinetic energy and dissolved methane gas in brine

Project Objectives:

- Conduct Long Term Flow Test
- Construct all surface facilities, power plant and begin power generation
- Assessment of technical & economic aspects of performance through direct and indirect job creation from the project

LOUISIANA GEOTHERMAL

Technology & Design:

- Plant will employ a hybrid power cycle in which combustible methane gas is separated from the hot geothermal brine at the wellhead, with the gas being used to power a gas turbine and the hot geothermal brine being delivered to a series of heat exchangers that transfer heat to a secondary working fluid (n-Pentane), which is used in an Organic Rankine Cycle to generate electric power.

- Heat Recovery from the gas engine exhaust to the secondary working fluid cycle may serve to augment electric power generation and improve the overall efficiency of the power cycle. We are currently still in the process of optimizing the design of the power cycle.

LOUISIANA GEOTHERMAL

Production Variables:

- Geothermal Well Production Rate (bbl/day)
- Methane Content of Geothermal Fluid/Brine (scf/bbl)
- Efficiency Capacity (Net Operating Days/Year)
- Price/ kWh for Net Geothermal Power

Market Outlook / Future Challenges:

- Mitigation of Drilling Risk
  - Difficulty in private equity markets due to value creation in drilling phase of project
- Lack of Renewable Portfolio Standard throughout Southeastern United States
- No incentive for utility companies to pay a premium for renewable power vs. other forms, despite the merits of clean, renewable base-load generation
- Geothermal is competitive with other forms of renewable energy technologies on a $/kw installed basis, but not against other forms of “brown” power

LOUISIANA GEOTHERMAL

Please visit us on our website for more information, project status and updates!

www.lageothermal.com

Presentation By: Phillip A. Gayle, Jr. – Chief Operating Officer
P.O. Box 1863 Lake Charles, LA 70602
Phone: (713) 783-2167 ext. 15
Email: phillip@lageothermal.com