



Solving the Geothermal



Data Puzzle



SMU Geothermal Conference
June 13-15, 2011

Martin Kay
MLKay Technologies, LLC



ABOUT MLKAY TECHNOLOGIES



MLKay Technologies provides innovative information technology & data services to the renewable energy, oil & gas, real estate & infrastructure sectors.

We are one of SMU's partners in the development of the DOE's National Geothermal Database.

We specialize in using data, technology and domain experience to identify scientifically relevant/economically viable investment opportunities for private companies, academic institutions, national laboratories, county, state & federal agencies.

GEOHERMAL DATA CHALLENGES

- Developing geothermal power requires a significant amount of resource, engineering, business and infrastructure knowledge
- Little geothermal specific data exists, so we turn to Oil & Gas data
- Oil & Gas data is vast, disparate and often difficult to work with
- In TX alone, we have collected and organized 100M+ unique records on 1.2M distinct wells from 11 formats & 14 sources
- Knowing what to look for, what to ignore, where to find it & how to access it requires both technological and domain experience (and a lot of patience). The NGDS will help solve much of this requirement

CHANGE YOUR PERSPECTIVE

Oil & Gas Data



Geothermal Data



WHAT DO WE NEED TO KNOW?

- ✓ **Resource Type of Interest**
- ✓ **Geographic Information**
- ✓ **Engineering/Wellbore Information**
- ✓ **Infrastructure Information**
- ✓ **Production & Flow Information**
- ✓ **Heat Flow Information**
- ✓ **Geologic Information**
- ✓ **Geophysical Information**
- ✓ **Economic & Business Information**

DATA SOURCES FOR TEXAS

- Texas Rail Road Commission
- Bureau of Economic Geology
- Oil & Gas Companies
- Well Log Libraries
- Universities
- Geologic Papers & Reports
- Prior DOE Reports (Geopressure)
- Retired Geologists Records
- State Agencies (Water Board, ERCOT, etc)
- GIS Data/ Imagery Sources



		Schlumberger	
Company:	Couch Oil & Gas, Inc.		
Well:	Couch 89 Guy #2		
Field:	Edgar Davis (Morris)		
County:	Shackelford	State:	Texas
PLATFORM EXPRESS			
Compensated Neutron			
Three-Detector LithoDensity			
Stratigraphic Interval:	Edge Data (Meters):	Depth (Meters):	Depth (Feet):
	Couch 89 Guy #2	11.00	36.10
	Couch Oil & Gas, Inc.		
	LOGS/LOGS		
Well:	API Serial No.	Section:	Block:
	42-411-20693	09	132
			Abstract:
			800
Logging Date:	27-Mar-2010		
Run Number:	One		
Depth Order:	3530 ft		
Schlumberger Depth:	3530 ft		
Bottom Log Interval:	3528 ft		
Top Log Interval:	135 ft		
Coating Order:	Size @ Depth:		
	8 Gal/in @ 131 ft		
Coating Schlumberger:	135 ft		
Bit Size:	7.875 in		
Type Fluid in Hole:	Fresh		
Density:	9.65 t/cm ³ @ 60 s		
Fluid Loss:	FRT		
Source Of Sample:	Mud Fil		
RMF @ Measured Temperature:	0.760 g/cm ³ @ 82 degF		
RMF @ Measured Temperature:	0.570 g/cm ³ @ 82 degF		
RMF @ Measured Temperature:	1.140 g/cm ³ @ 82 degF		
Source Method:	RMF	Calculated	Calculated
RMF @ MRT:	RMF @ MRT:	0.528 @ 121 (0.386 @ 121)	
Maximum Recorded Temperature:	121 degF		
Circulation Stopped:	Time 7:30		
Logger On Bottom:	Time 13:15		
Well Number:	1016 - Abilene		
Recorded By:	Ben Williams		
Witnessed By:	Mr. Bill Woodruff, Charles Couch		



WHERE TO FIND THE DATA I?

○ Resource Type

- ✓ Market Driven

○ Geographic

- ✓ Well Headers
- ✓ Surveys
- ✓ Digital Map Data

○ Engineering/Wellbore

- ✓ Well Headers
- ✓ Wellbore Data
- ✓ Well Test Data
- ✓ Well Status Data

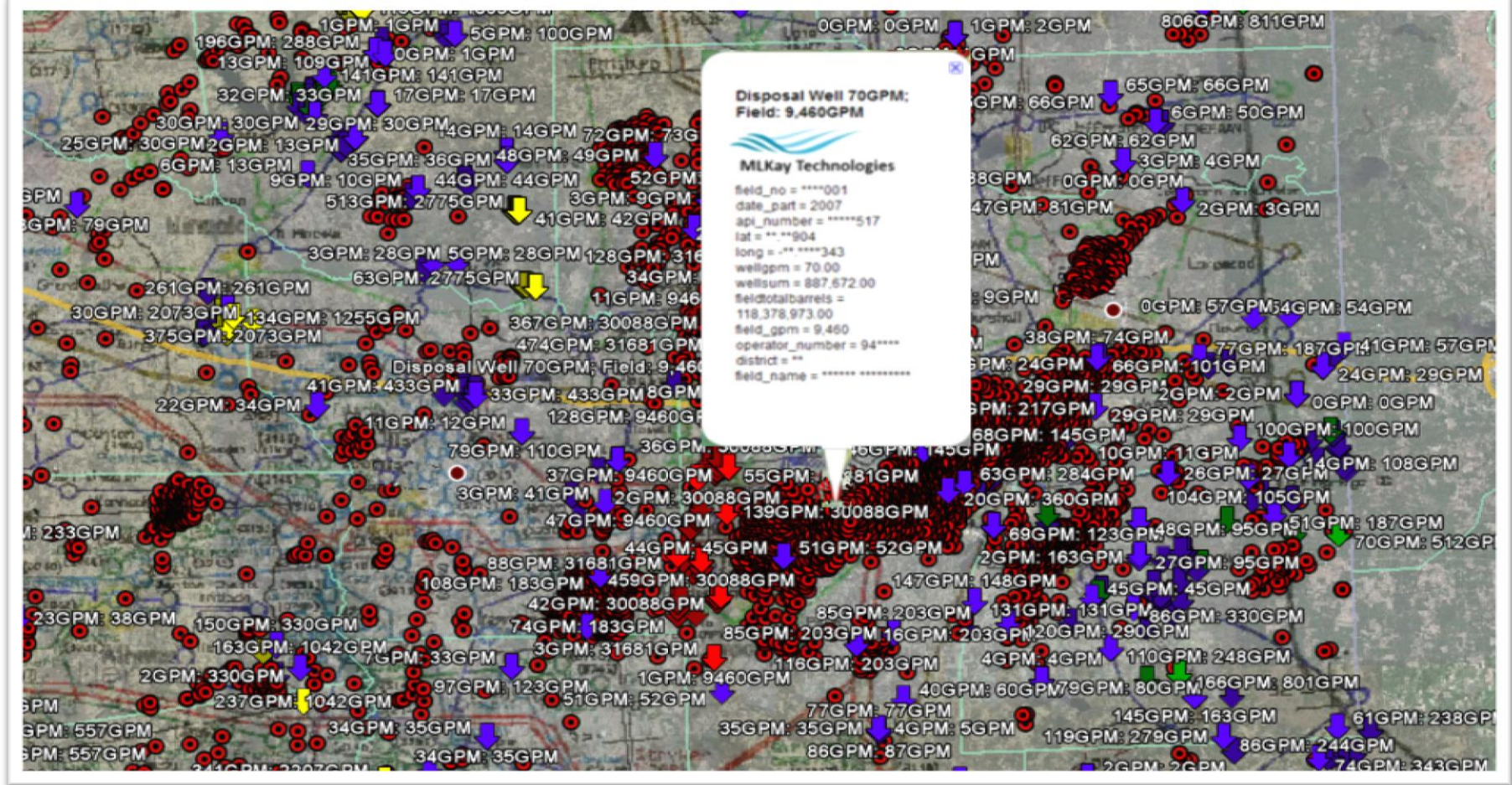
○ Infrastructure

- ✓ Topographical GIS Layers
- ✓ Pipeline GIS Layer
- ✓ Water Resource Layer
- ✓ Ambient Conditions
- ✓ **ERCOT Grid-Interconnect**

○ Production & Flow

- ✓ Injection & Disposal Data
- ✓ Well Test Data
- ✓ Production Data

VISUAL REPRESENTATION I



Injection & Disposal ALL YEARS, Depth > 10,000 ft, Producing or Temp Abandoned, Display Infrastructure, Display Grid

WHERE TO FIND THE DATA II?

○ Heat Flow

- ✓ Well Headers
- ✓ Temperature Tests
- ✓ Heatflow Databases

○ Geology

- ✓ Well Logs
- ✓ Well Test Data
- ✓ Drill Stem Tests
- ✓ *Geochemical Tests*

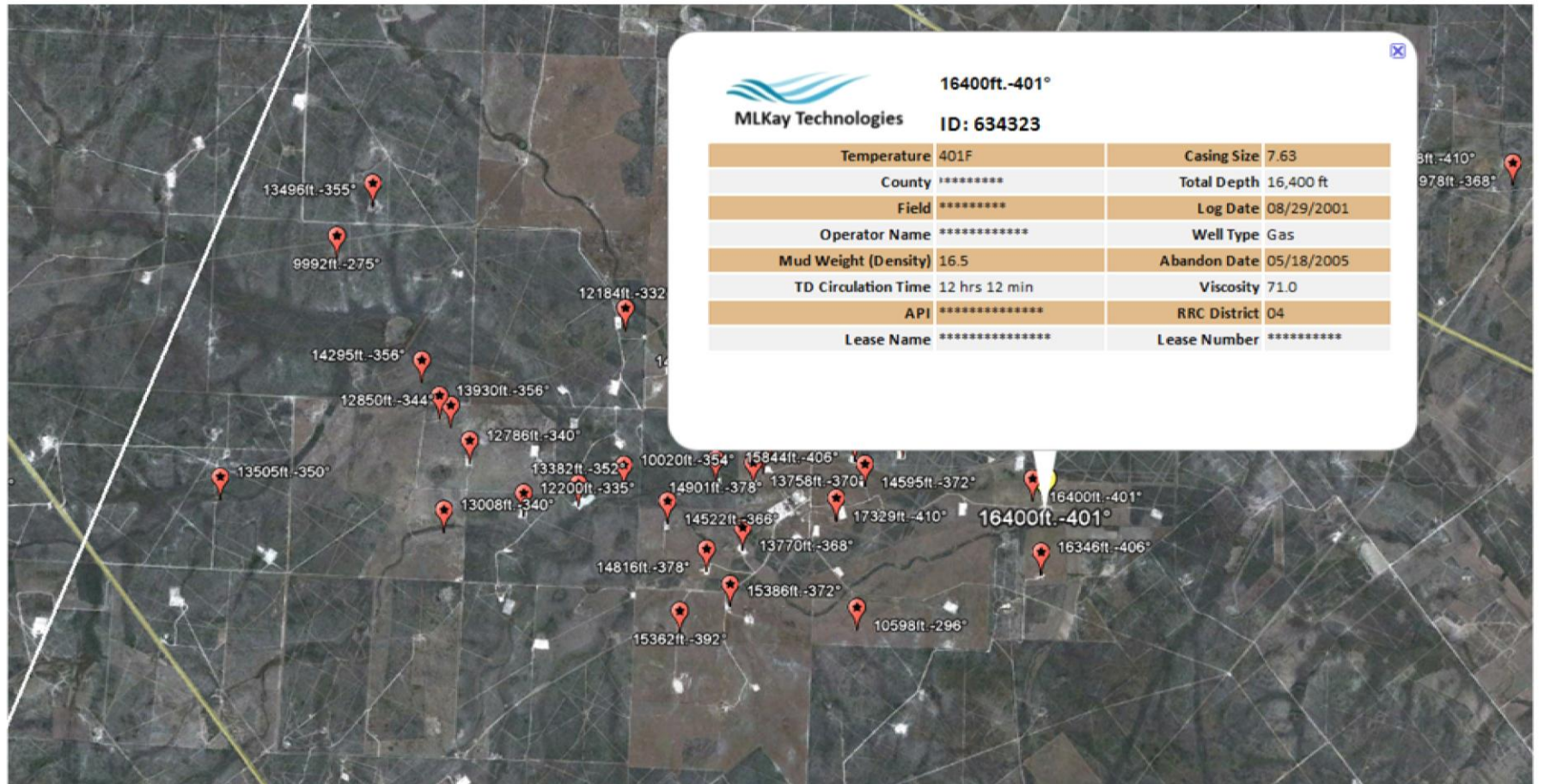
○ Geophysical

- ✓ Well Logs
- ✓ Seismic Data
- ✓ *Reservoir Data*

○ Economic & Business

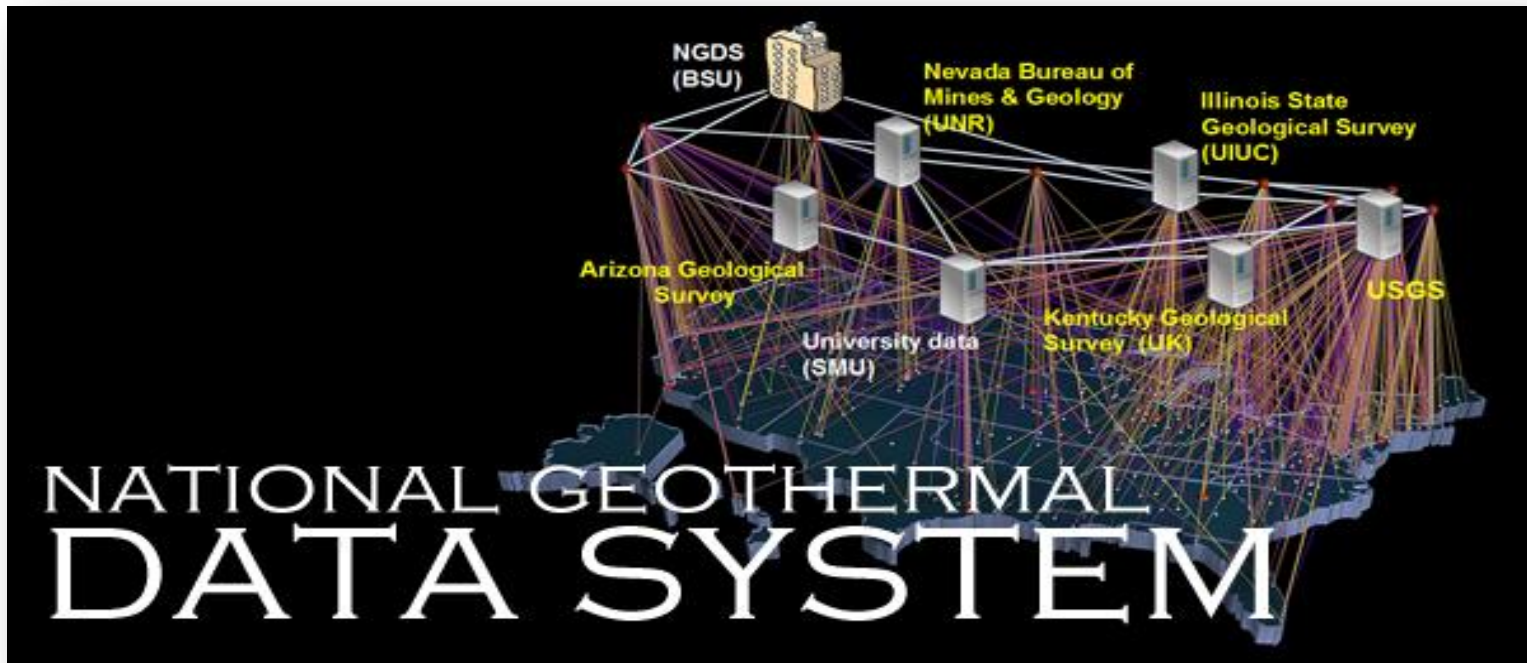
- ✓ Market Demand-Utilities
- ✓ Ownership/Lease Data
- ✓ Permitting Data
- ✓ Tax Incentives

VISUAL REPRESENTATION II



Wellbore>10,000 ft., Temperature >270F, Well Type = Gas, Display Infrastructure

ORGANIZING & ACCESSING DATA



THANK YOU



Martin Kay, Managing Director
MLKay Technologies, LLC
Houston, TX
Main Tel: 888.203.4311
Direct: 713.568.5440
martin@mlkay.com