Virginia's Contributions to the National Geothermal Data System

Wendy Kelly, DGMR

August 7th 2013

Virginia Department of Mines, Minerals and Energy

U.S. DEPARTMENT OF ENERGY

Acknowledgements

DGMR Geothermal Team:
William Lassetter
Wendy Kelly
Chelsea Feeney
Mike Enomoto
Katie Hernon
Curt Romanchok
Jessee Standbridge
Ralph Hill
Jerrica Frasier
Josh Seay
Noah Egge

Georgia Department of Natural Resources:
Roy Roundtree
Anthony Chumbley
Jim Kennedy

Arizona Geological Survey:
Diane Love
Kim Patten
Steve Richard
Celia Coleman
Christy Caudill

U.S. Geological Survey:
Lester Williams
Wendy McPherson
George Harlow
David Nelms
Niel Plummer
Randy McFarland
Jerry Casile

Virginia Department of Environmental Quality:
Scott Bruce
Joel Maynard
Brad White
Todd Beach

Karst Waters Institute:
William Jones

Maryland Geological Survey:
David Bolton
David Brezinski
David Drummond
Dale Shelton
Megan Farley

Division of Mined Land Reclamation:
Link Elmore

North Carolina Geological Survey:
Kenneth Taylor
Jeff Reid
Walter Haven
Nat Wilson
Jeff Lautier

The Homestead:
Roger Waldeck

Virginia Tech:
John Costain
Stephen Paskvich

Hickey Electric
TLC Heating and Air
VSC Geothermal
Horseman Heating
James River AC Co.

Virginia Division of Gas and Oil:
Blair Linford
James Lovett

James Madison University:
John Haynes
Meghan Moss

Kentucky Geological Survey:
Doug Curl

Delaware Geological Survey:
Sandy Schenck
David Wunsch
John Talley

Maryland Department of the Environment:
Greg Day

West Virginia University:
Dorothy Vesper
Johnathon Moore

Southern Methodist University:
Maria Richards
David Blackwell
Zachery Frone

Outline

1. Data types compiled for the NGDS
2. The Data Collection Process
3. Data Coverage - MD, VA, GA, DE, NC
4. Next Steps

Data for the NGDS

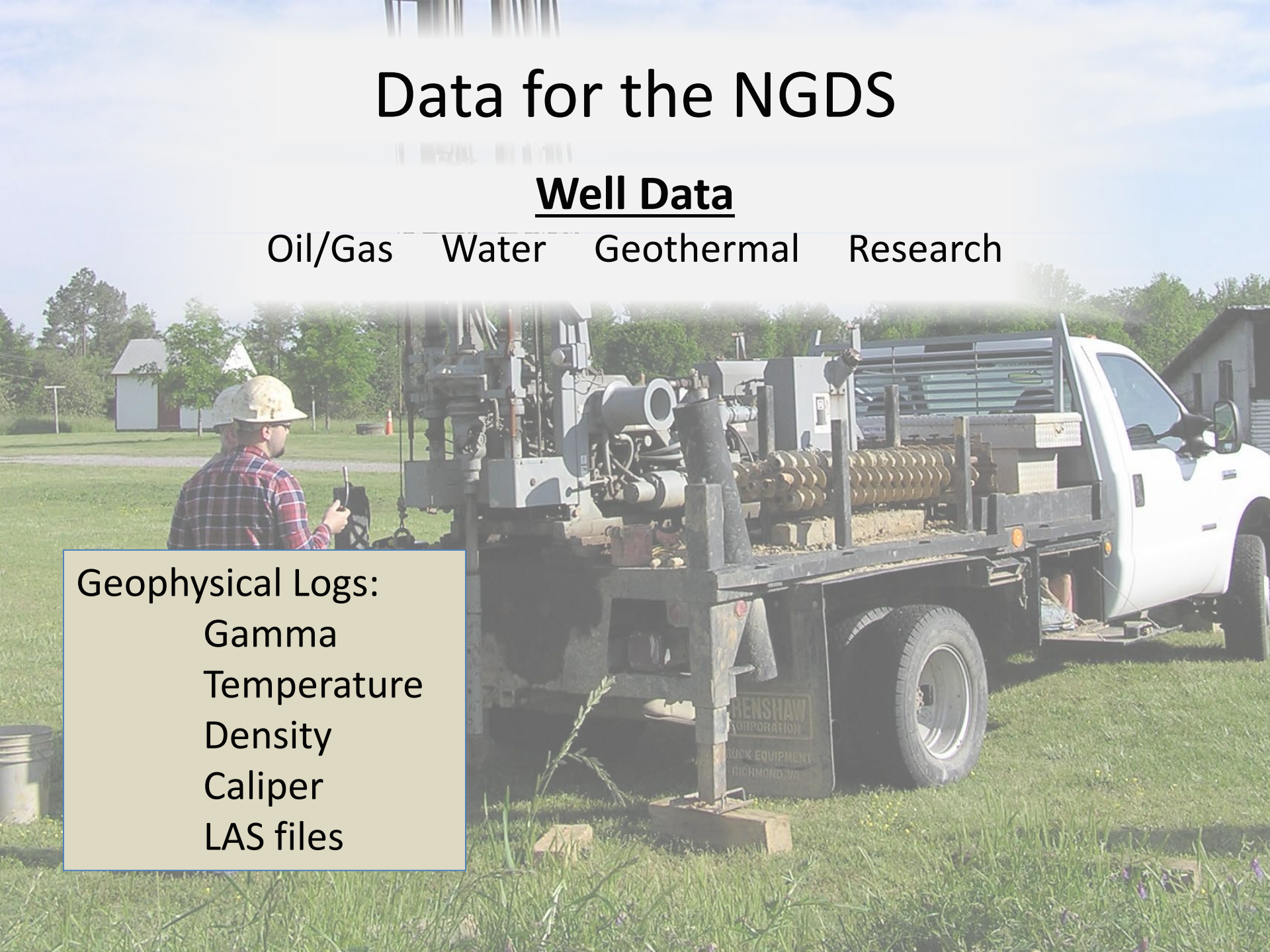
Well Data

Oil/Gas Water Geothermal Research

Data for the NGDS

Well Data

Oil/Gas Water Geothermal Research



Geophysical Logs:

- Gamma
- Temperature
- Density
- Caliper
- LAS files

BU-0170_B.las - Notepad

File Edit Format View Help

```
#MNEM.UNIT              Value              Description
#----------     -------------------     -------------------
 DATE.                     9/8/1977:    Date As Month-Day-Year
 RUN .                          ONE:    Run Number
 PDAT.                           GL:    Permanent Datum
 EPD .FT                  1484.0000:    Elevation Of Perm. Datum
 LMF .                           KB:    Log Measured From
 FAPD.FT                    10.0000:    Feet Above Perm. Datum
 DMF .                           KB:    Drilling Measured From
 EKB .FT                  1494.0000:    Elevation Of Kelly Bushing
 EDF .FT                  1493.0000:    Elevation Of Derrick Floor
 EGL .FT                  1484.0000:    Elevation Of Ground Level
 TD  .FT                  3460.0000:    Total Depth
 BLI .FT                  3450.0000:    Bottom Log Interval
 TLI .FT                  1900.0000:    Top Log Interval
 DFT .                          Air:    Drilling Fluid Type
 MRT .DEGF                  88.5000:    Maximum Recorded Temperature
 ENGI.                         Roth:    Engineer'S Name
 WITN.          Mr. Connerey & Mr. :    Witness' Name
 WSTA.                          LOC:
#
~Other Information Block
<DescLogPlotStart>   NEURALOG PLOT DEFINITION
PLOTDEFVERSION: 3
LASFILE: X:\Projects\DOE_GEOTHERMAL\Metadata_YEAR_3\Derivative_Maps\HeatFlow\Al
DEPTHSCALE: 240.000000
RESOLUTION: 300
DEPTHLABELFREQ: 100.000000
HEAVYGRIDFREQ: 100.000000
MEDIUMGRIDFREQ: 50.000000
LIGHTGRIDFREQ: 10.000000
#
#    TRACK 1
#
STARTTRACK:
 LEFTX: 0.500000 inch
 RIGHTX: 8.010000 inch
 SCALETYPE: Linear
 NUMCHARTDIVISIONS: 29
CURVE: TEMP   60.000000   90.000000   (0,0,255)      Solid              2      N
ENDTRACK:
#
#    TRACK 2
#
STARTTRACK:
 LEFTX: 8.510000 inch
 RIGHTX: 13.510000 inch
 SCALETYPE: Linear
 NUMCHARTDIVISIONS: 10
ENDTRACK:
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~A DEPTH      TEMP
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    1906.500 76.46992709
    1907.000 76.47259372
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    1908.000 76.47792700
    1908.500 76.48059365
    1909.000 76.48326029
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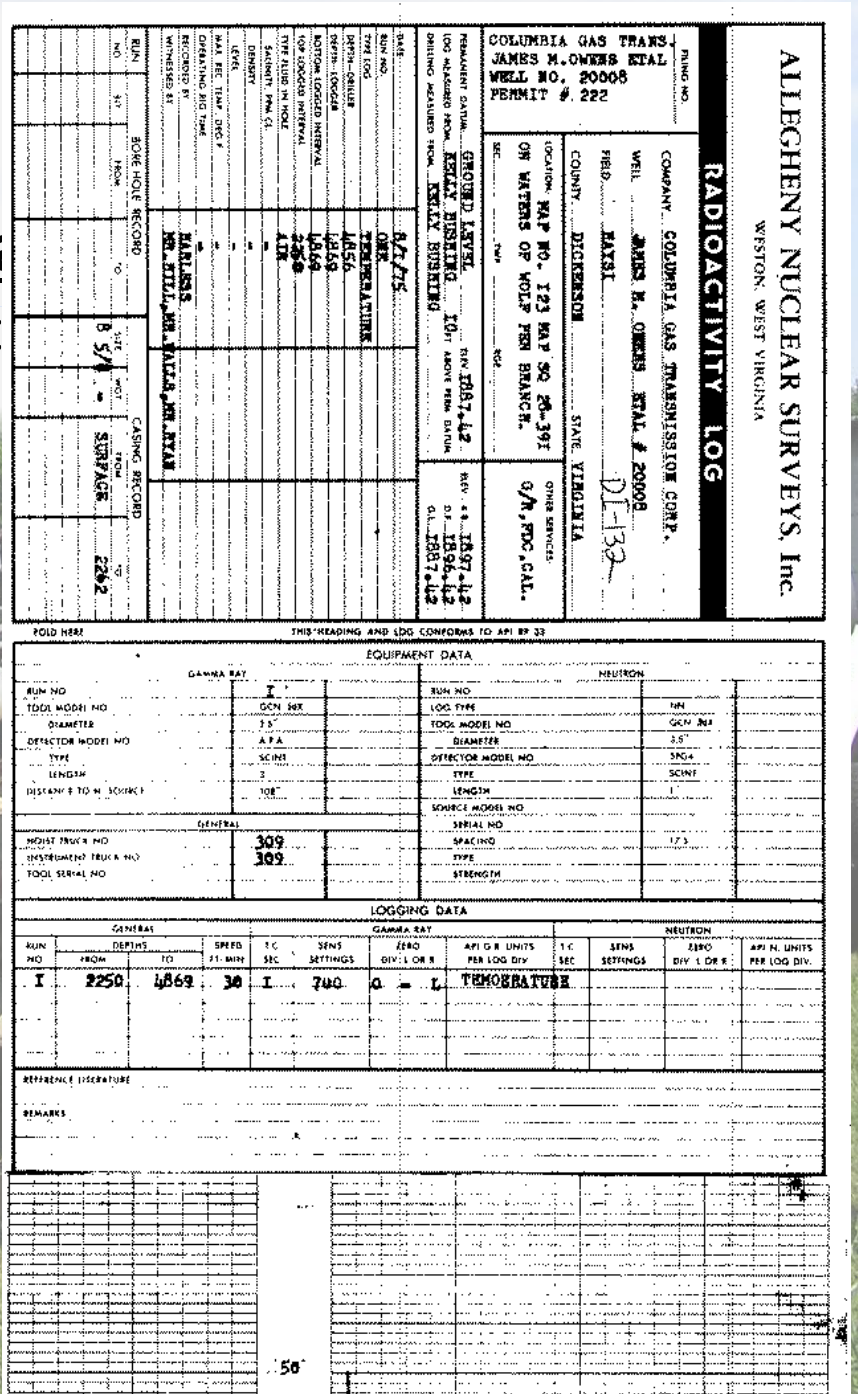


ALLEGHENY NUCLEAR SURVEYS, Inc.
WESTON, WEST VIRGINIA

RADIOACTIVITY LOG

COMPANY COLUMBIA GAS TRANSMISSION CORP.
WELL JAMES M. OWENS ETAL # 20008
FIELD HAZEL
COUNTY DICKERSON STATE VIRGINIA
LOCATION: MAP NO. 123 MAP SQ 20-39I ON WATERS OF WOLF PEN BRANCH.

COLUMBIA GAS TRANS.
JAMES M.OWENS ETAL
WELL NO. 20008
PERMIT #. 222

DI-132

PERMANENT DATUM GROUND LEVEL
LOG MEASURED FROM KELLY BUSHING
DRILLING MEASURED FROM KELLY BUSHING
10 FT ABOVE PERM. DATUM
ELEV. 1487.42
DATE 8/1/75
RUN NO. ONE
TYPE LOG TEMPERATURE
DEPTH-DRILLER 4856
DEPTH-LOGGER 4869
BOTTOM LOGGED INTERVAL 4869
TOP LOGGED INTERVAL 2250
TYPE FLUID IN HOLE AIR
SALINITY, PPM CL -
DENSITY -
LEVEL -
MAX. REC. TEMP. DEG.F -
OPERATING RIG TIME -
RECORDED BY -
WITNESSED BY MR. BILL, MR. BAKER, MR. RYAN

BORE HOLE RECORD
RUN NO. 1
FROM 0
TO 4869
SIZE 8 5/8
WGT. -

CASING RECORD
FROM SURFACE
TO 2262

OTHER SERVICES G/N, FDC, CAL.

REV. ELEV. 1497.42
D.F. ELEV. 1494.42
G.L. ELEV. 1487.42

FOLD HERE

THIS HEADING AND LOG CONFORMS TO API RP 33

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO	I	RUN NO	
TOOL MODEL NO	GCN 36X	LOG TYPE	NN
DIAMETER	3.5"	TOOL MODEL NO	GCN 36X
DETECTOR MODEL NO	A P A	DIAMETER	3.5"
TYPE	SCINT	DETECTOR MODEL NO	3NG4
LENGTH	3	TYPE	SCINT
DISTANCE TO N. SOURCE	108"	LENGTH	1
		SOURCE MODEL NO	
		SERIAL NO	
		SPACING	17.5
		TYPE	
		STRENGTH	

GENERAL

HOIST TRUCK NO	309
INSTRUMENT TRUCK NO	309
TOOL SERIAL NO	

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO	DEPTHS FROM	DEPTHS TO	SPEED FT/MIN	T.C. SEC	SENS SETTINGS	ZERO DIV. 1 OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC	SENS SETTINGS	ZERO DIV. 1 OR R	API N. UNITS PER LOG DIV.
I	2250	4869	30	I	740	0 - L	TEMPERATURE				

REFERENCE (TEMPERATURE)

REMARKS

50

Data for the NGDS

Well Data

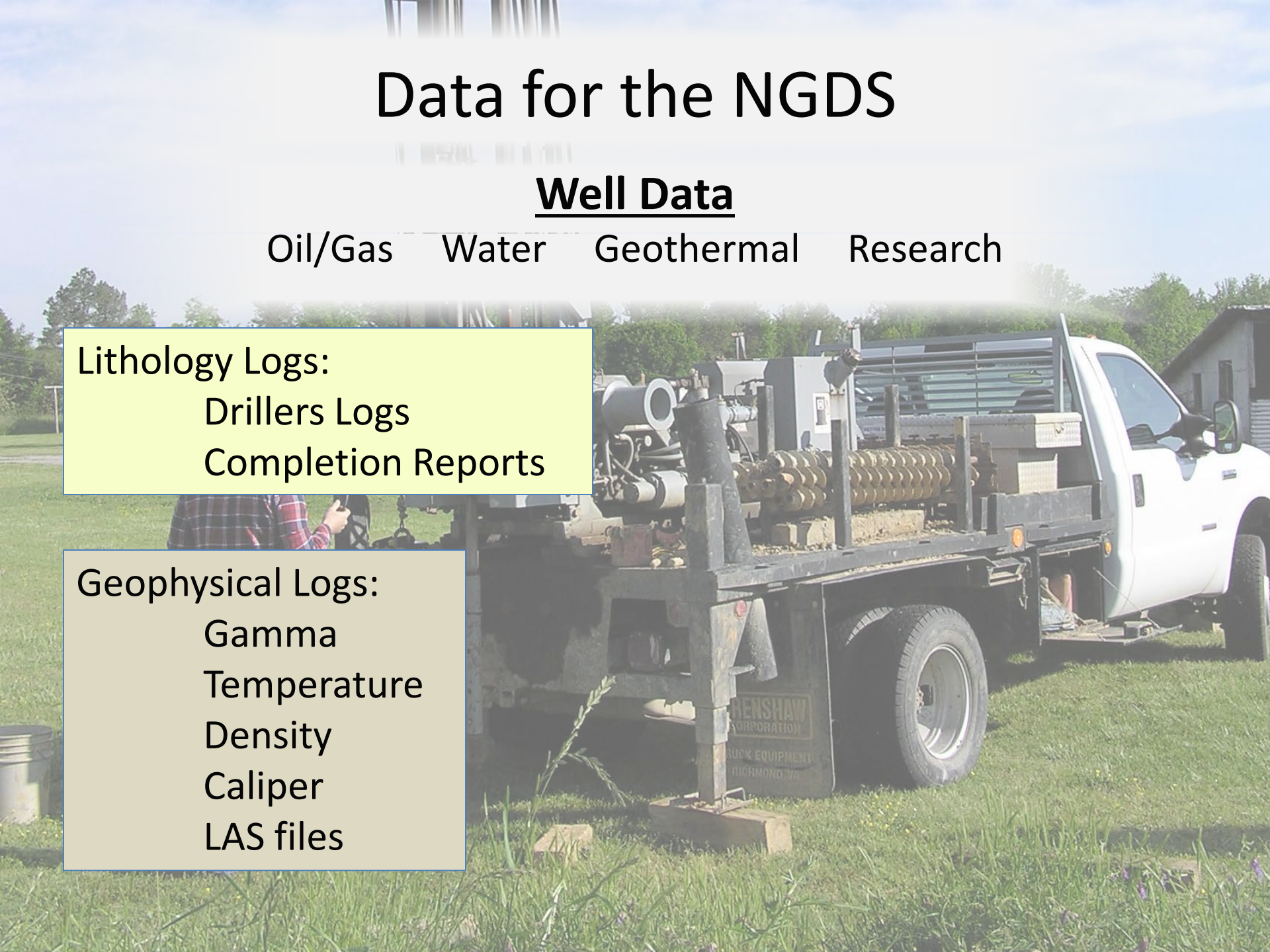
Oil/Gas Water Geothermal Research

Lithology Logs:

- Drillers Logs
- Completion Reports

Geophysical Logs:

- Gamma
- Temperature
- Density
- Caliper
- LAS files



Form 5

STATE OF MARYLAND
DEPARTMENT OF GEOLOGY, MINES AND WATER RESOURCES
The Johns Hopkins University
BALTIMORE 18, MARYLAND

WELL COMPLETION REPORT

This report must be submitted within 30 days after completion of the well

WELL DESCRIPTION

WELL LOG

State the kind of formations penetrated, their depth, their thickness, and if water-bearing

	FEET from	FEET to
Clay	0	10
Slate	10	306
Light Brown Shale	306	394
Gray Shale	394	502
Slate & Shells	502	698
Lime	698	720
Slate & Shells	720	875
Lime	875	892
Slate	892	965
Lime	965	1005
Slate & Shells	1005	1018
Lime	1018	1044
Slate & Shells	1044	1262
Slate & Shells Brown	1262	1318
Slate & Shells Gray	1318	1937
Slate & Shells Dark Gray	1937	1971
Slate & Shells Lt. Brn.	1971	2124
Lime	2124	2137
Slate & Shells Dk. Brn.	2137	2554
Slate & Shells Black	2554	2780

CASING AND SCREEN RECORD

State the kind and size of casing, liner, shoe, screen, and other accessories (if no casing used, give diameter of well)

	DIAM. (inches)	FEET from	FEET to
Drilled 12½" hole to 200' and ran	10 3/4	to 200'	
Drilled 10" hole to 1010' and reduced hole to 8" - Drilled 8" hole to 3267' and ran	7 OD	to 3252'	
Drilled 6 1/4" hole to 3522' and tubed with	2 3/8OD	to 3511'	
Gas at	total amount		

Permit Number 6864

Name of Owner
Snee & Eberly

PUMPING TEST

Hours Pumped

Pumping Rate
Gallons per Minute

WATER LEVEL

Distance from land surface to water:

Before Pumping Ft.

When Pumping Ft.

APPEARANCE OF WATER

Clear

Cloudy

Taste

Odor

Height of Casing Above Land Surface Ft.

Data fo

W

Oil/Gas Water

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DAVIDSON OIL DEVELOPMENT COMPANY INC.
DRILLING LOG

ROPER LUMBER COMPANY WELL #1
SEPTEMBER, 1951

0-150	10 3/4" surface casing
150-240	sandy lime and shale streaks
240-261	hard sand shells and lime
261-340	sand and shells
340-360	sand
360-375	sand and shells
375-428	sand and shells
428-490	sand and shells
490-744	soft sticky shale and shells
744-786	soft sticky shale
786-813	sand
813-864	sand
864-878	soft shale
878-1069	sand and shale
1069-1140	soft shale
1140-1220	sand and shale
1220-1306	shale and sand
1306-1350	soft shale
1350-1360	sand
1360-1701	shale and sand
1701-1770	sand and shale

PE-OT-4-66

Company: N.C. Oil + Gas

Well: #1 MacMillan

Location: Vista

Elev. 42' D.F. State: North Carolina

T.D. 1431' County: Pender

Production: D + A

Cored Interval

Survey

DIVISION OF MINERAL RESOURCES

SPONTANEOUS-POTENTIAL (millivolts)	LITHOLOGY	RESISTIVITY ohms m²/m	Shows: A-asphalt, O-oil, G-gas, W-water, M-mud	Color	Grain Size: VF-very fine, F-fine, M-medium, CR-coarse,	Porosity - %	Cement: C-calcite, A-anhydrite, L-limonite	Accessory Minerals: S-siderite, G-glauconite, M-mica, Ph-phosphate, P-pyrite, L-limonite, Q-quartz, F-feldspar	Grain Type and Matrix (Carbonate)	Megafauna: A-abundant, C-common, R-rare	Microfauna: " " "		FOSSIL IDENTIFICATION AND MISC. DATA
													J.T. Ward
					F-M			M G Ph Hv		A	C		
					F-M			M G Ph Hv		A	C		
					F-M			M G Ph Hv		A	C		
					F-M			M G Ph Hv		C	R		
					F			M G Ph Hv		R	R		
					F			M G Ph Hv		A	C		
					F-M			M G Ph H		A	C		
					F-VCR			M G		A	C		
					F-M		R	M C G		R	R		
100					F-M		R	M Ch G		A	A		
					F-M		A	M Ph G		A	A		
					F-M		A	M Ch G		A	A		
					F-M		A	M Ch G		A	A		
										A	A		
Top Eocene ?										A	A		Rotalia sp.?
								O		A	A		Eponides carolinensis
								O		A	A		
								O		A	A		
								O		A	A		
200								O G Ph		A	A		decrease in foraminifera content
					F-CR			A C Ph		A	A		
					F-CR			A G Ph		A	A		
Top "K" Peedee					F-CR			G Ph		A	A		
					F-CR			G Ph Hv		A			20% ss, f-gr. glauc.
					F-CR			G Ph Hv		A			dk. gray dyst. frag.
					F-CR			G Ph Hv		A			med gray glauc. ss
					F-CR			G Ph Hv		A			
					F-CR			G Ph Hv Ph		A			

Data for the NGDS

Well Data

Oil/Gas Water Geothermal Research

Lithology Logs:
- Drillers Logs
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Bottom Hole Temperatures

Geophysical Logs:
- Gamma
- Temperature
- Density
- Caliper
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Data for the NGDS

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Heat Flow measurements

Data for the NGDS

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- Completion Reports

Bottom Hole Temperatures

Geophysical Logs:
- Gamma
- Temperature
- Density
- Caliper
- LAS files

Heat Flow measurements

Thermal Conductivity measurements
- Down Hole samples
- Surface samples

Data for the NGDS

Geologic Formation Data

Descriptions of Geologic Units with elevated U, Th, & K

Geochemistry of Geologic Units with elevated U, Th, & K

Geologic Maps

Data for the NGDS

Gravity Data

Gravity Station Data

Gravity Maps

Data for the NGDS

Springs Data

Descriptions of Thermal Springs

Aqueous Chemistry for Thermal Springs

Data for the NGDS

Publications

Any publications containing information relevant to geothermal research

Diment et al., 1963, Terrestrial Heat Flow near Alberta, Virginia

Brown, 1978-1979, Hot Dry Rock Geothermal Energy Development

A Symposium on Geothermal Energy and its Direct Uses in the East

Hinze et al., 1986, Exploration for Hot-Dry-Rock Geothermal Resou

Anderson and Lund, 1979, Direct utilization of geothermal energy - A

Bollinger and Gilbert, 1974, A Reconnaissance microearthquake surv

Ryan et al., 2006, Reconnaissance Borehole Geophysical, Geological, Culpeper, Orange, and Fairfax Counties, Virginia [Version 1.0], US 2006-1203

Ryan et al., 2008, Reconnaissance Borehole Geophysical, Geological, and Hydrological Data from the Proposed Hydrodynamic Compartments of the Culpeper Basin in Loudoun, Prince William, Culpeper, Orange, and Fairfax Counties, Virginia, U.S. Geological Report 2006–1203, Version 1.0, DVD Ordering Information

Giardini, 2009, Geothermal quake risks must be faced, v.462/17, Nature

Nolde and Giannini, 1997, Ancient Warm Deposits in Bath and Rockingham Counties, Virginia

Potential of Hot-Dry-Rock Geothermal Energy in the Eastern, United States,1993, U.S. Geological Survey in collaboration with the U.S. Department of Energy, USGS Open-file Report 93-377, November

Renner and Vaught - Geothermal Resources of the Eastern United States - 1979

Severini and Huntley, 1983, Heat convection in Warm Springs Valley Virginia

Tillman, 1980, Eastern geothermal resources - Should we pursue them?, Science, v. 210, November

Heiken et al., 1983, Workshop on Exploration for Hot-Dry-Rock Geothermal Systems

Cooper, S., 1986, Evaluation of Pesticides in Groundwater, *in* Geology of a Field Site, Study of Pesticide Migration in the unsaturated and saturated zones of Dougherty Plain, Southwest Georgia, **ISBN13:** 9780841209794

Hendry et al., 1982, Geothermal Investigations in West Virginia, Los Alamos National Laboratory, Los Alamos, NM, LA-9558-HDR

Lee and Froelich, 1989, Triassic-Jurassic Stratigraphy of the Culpeper and Barbourseville Basins, Vrginia and Maryland, USGS Professional Paper 1472, available online.

The Great Alaska earthquake of 1964, Volume 1, Part 1, National Research Council (U.S.), Committee on the Alaska Earthquake, Publication 1603, National Academy of Sciences, 1968

Smith and Dees, 1982, Indicators of low-temperature geothermal resources in northern Louisiana and central Mississippi, Journ. Volcanology and Geothermal Research, v. 14, 389-393.

Waring, G.A., 1965, Thermal Springs of the United States and Other Countries of the World - A Summary, U.S. Geological Survey Professional Paper 492

Scholle, P.A., Geological Studies on the COST No. B-2 Well, U.S. Mid-Atlantic Outer Continental Shelf Area, U.S. Geological Survey Circular 750

Evaluation of Hot-Dry-Rock Exploration Techniques in the Atlantic Coastal Plain, D'Appolonia Consulting Engineers, Inc. Report LA-8800-MS to Los Alamos Scientific Laboratory, 1979

Kantrowitz, T.H. and W.E. Webb, Geologic and Hydrologic Data From A Test Well Drilled Near Chestertown, Maryland, U.S. Geological Survey Water Resources Division, Open File Report 71-168

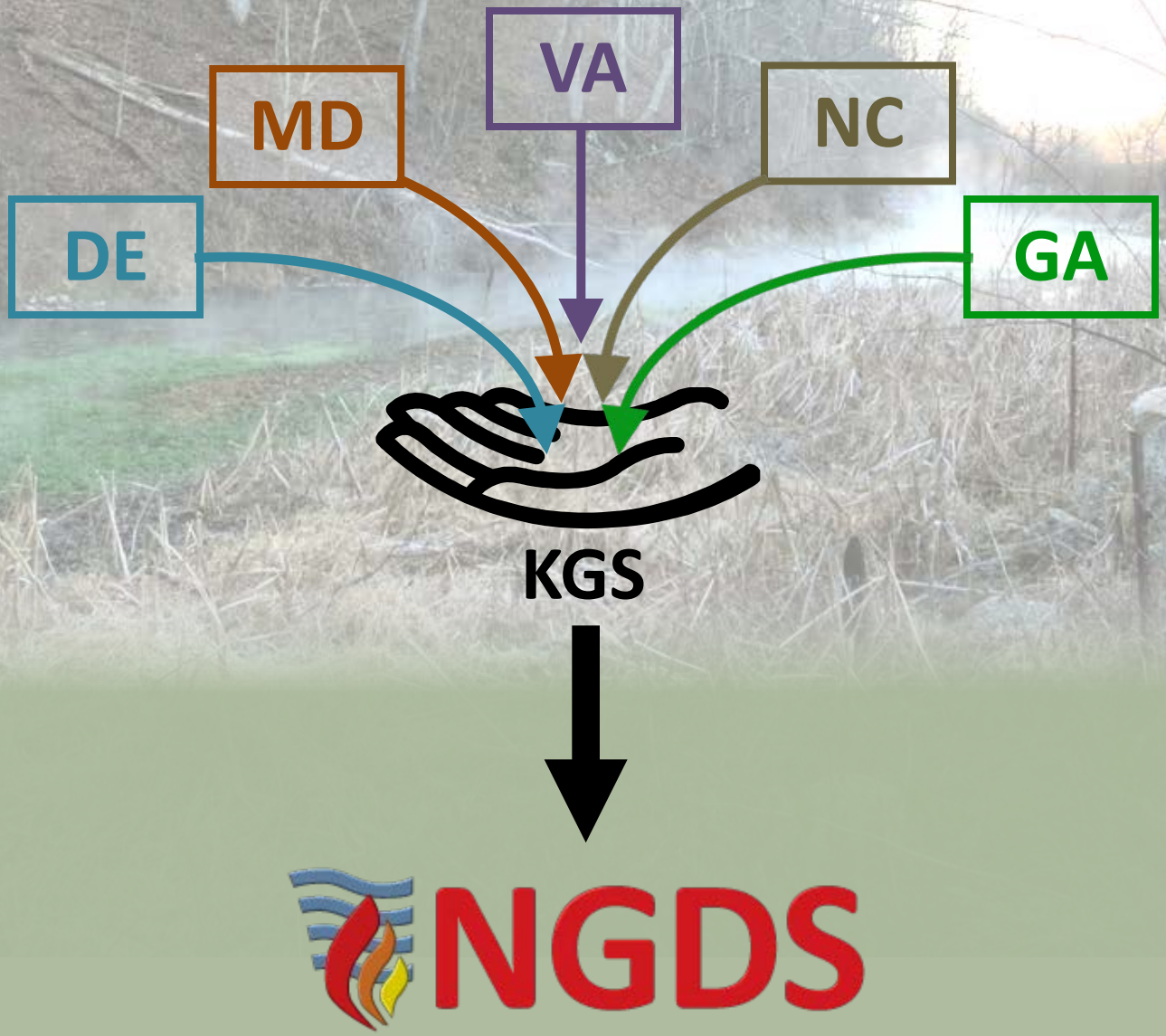
Richards et al., 1962, Generalized Structural Contour Maps of the New Jersey Coastal Plain, Geologic Report Series No. 3, New Jersey Geological Survey

Kasabach and Scudder, 1961, Deep Wells of the New Jersey Coastal Plain, Geologic Report Series No. 3, New Jersey Geological Survey, 1961

Newman, 1983, Potential Geothermal Energy Use at East Coast Naval Facilities, Applied Physics Laboratory, Johns Hopkins University, NAVAL WEAPONS CENTER,CHINA LAKE, CALIFORNIA 93555

Lohse, CD Hopkins et al., Geothermal Well of Opportunity No. 2, Wayne County, GA (Operational Report from Gruy Federal), July 1978

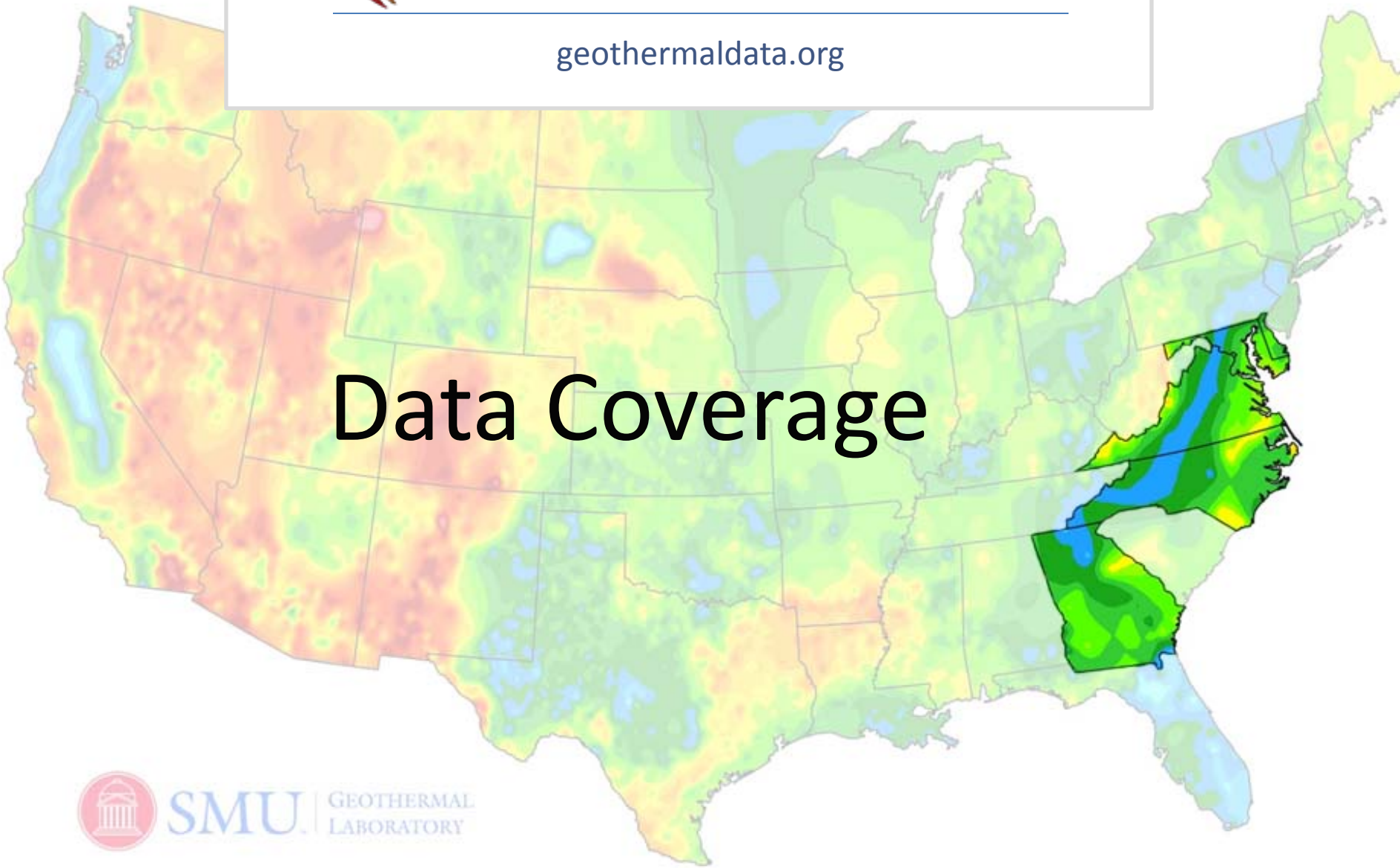
Data Collection Process



NGDS National Geothermal Data System

geothermaldata.org

Data Coverage



SMU GEOTHERMAL LABORATORY

NGDS National Geothermal Data System

geothermaldata.org

MDE

MARYLAND DEPARTMENT OF NATURAL RESOURCES

DM ME Division of Geology & Mineral Resources

RESEARCH DELAWARE GEOLOGICAL SURVEY SERVICE EXPLORATION

DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

GEOLOGICAL SURVEY N.C. 1823

DM ME Gas and Oil Division

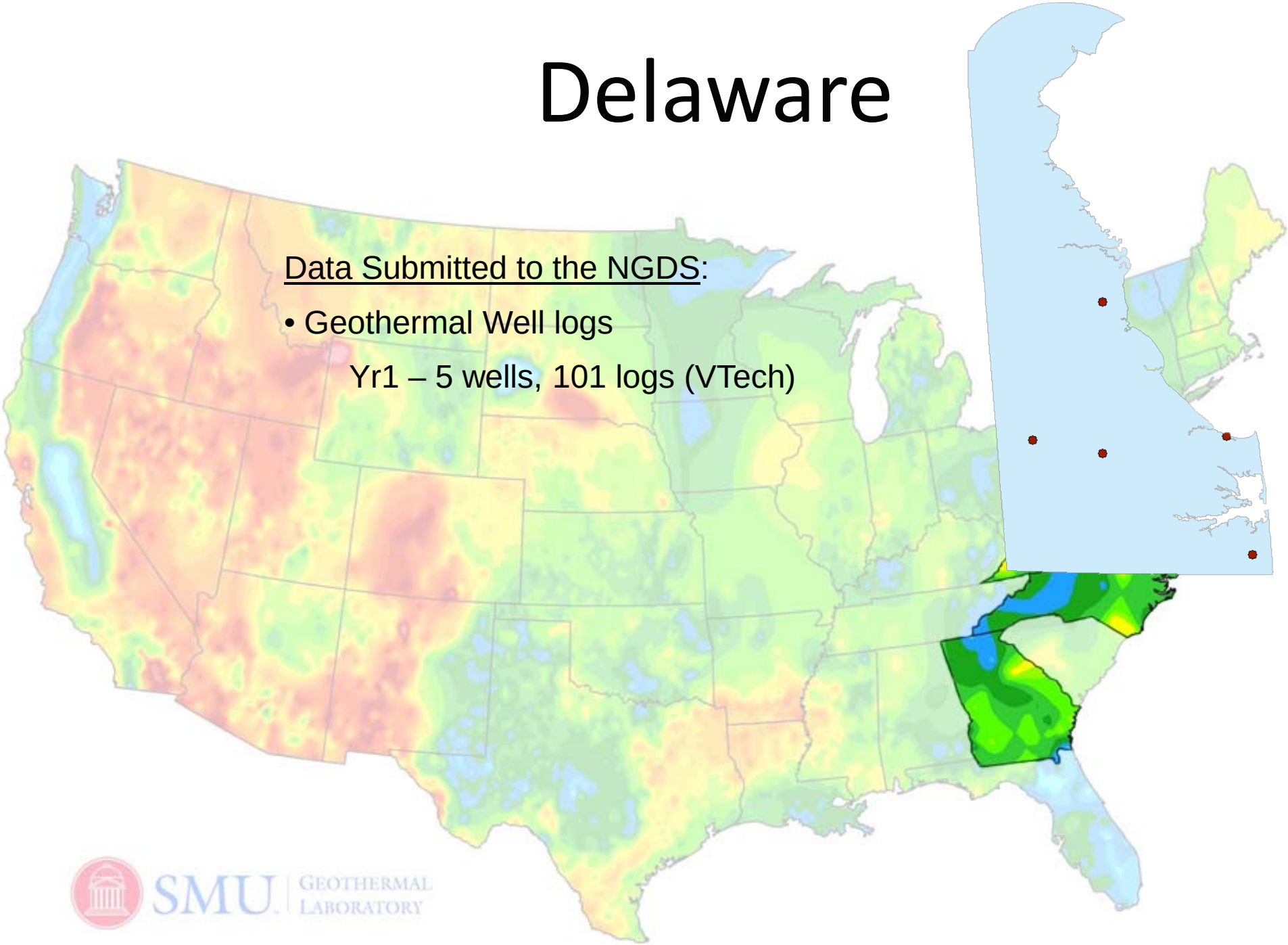
USGS science for a changing world

EPD

GEORGIA DEPARTMENT OF NATURAL RESOURCES

SMU GEOTHERMAL LABORATORY

Delaware



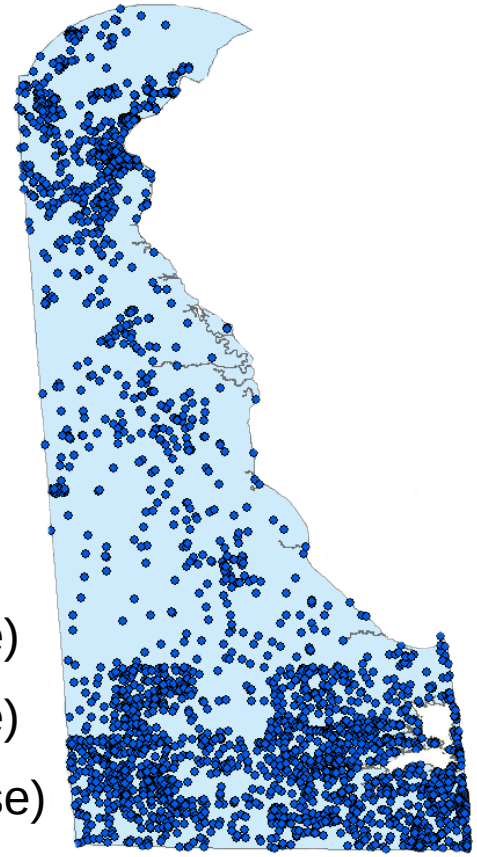
Data Submitted to the NGDS:

- Geothermal Well logs

  Yr1 – 5 wells, 101 logs (VTech)

SMU | GEOTHERMAL LABORATORY

Delaware



<u>Data Submitted to the NGDS</u>:

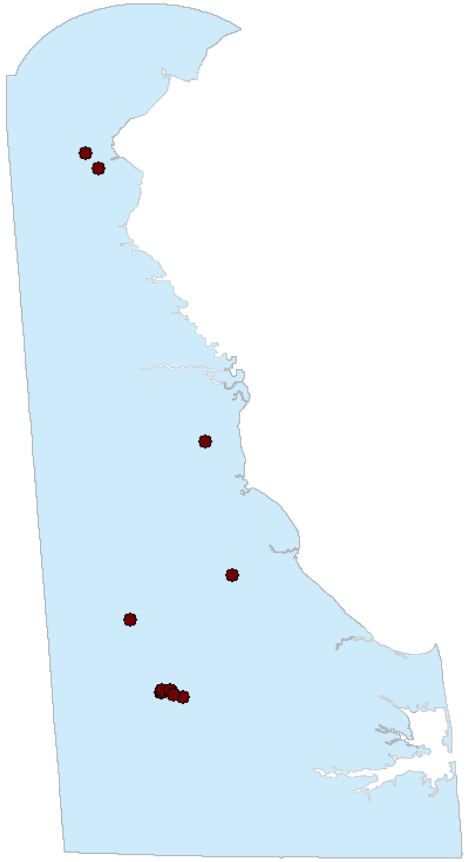
- 101 Geothermal Well logs
- Water Well logs

  Yr1 – 563 wells, 2344 logs (DGS database)

  Yr2 – 319 wells, 1036 logs (DGS database)

  Yr3 – 5302 wells, 8280 logs (DGS database)

Delaware



<u>Data Submitted to the NGDS</u>:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- Oil and Gas Well logs

  Yr2 – 3 wells, 12 logs (DGS database)

  Yr3 – 9 wells, 26 logs (DGS database)

Delaware

Data Submitted to the NGDS:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- 38 Oil and Gas Well logs
- Geologic Maps

  Yr1 – 16 maps (DGS publications)

  Yr2 – 1 map (DGS publication)

  Yr3 – 1 map (DGS publication)

Delaware

Data Submitted to the NGDS:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- 38 Oil and Gas Well logs
- 18 Geologic Maps
- Geothermal Publications

  49 publications referenced (DGS)

Delaware

Data Submitted to the NGDS:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- 38 Oil and Gas Well logs
- 18 Geologic Maps
- 49 Geothermal Publications
- Geologic Units

  54 descriptions of lithologic units (DGS publications)

Delaware

<u>Data Submitted to the NGDS</u>:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- 12 Oil and Gas Well logs
- 18 Geologic Maps
- 49 Geothermal Publications
- 54 Geologic Units
- Borehole Temperatures

  Yr1 – 18 BHT measurements (DGS, VTech)

  Yr2 – 20 BHT measurements (DGS, VTech)

  Yr3 – 13 BHT measurements (DGS, VTech)

Delaware

<u>Data Submitted to the NGDS</u>:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- 38 Oil and Gas Well logs
- 18 Geologic Maps
- 49 Geothermal Publications
- 54 Geologic Units
- 51 Borehole Temperatures
- Heat Flow measurements

  Yr1 – 5 measurements (VTech)

Delaware

Data Submitted to the NGDS:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- 38 Oil and Gas Well logs
- 18 Geologic Maps
- 49 Geothermal Publications
- 54 Geologic Units
- 51 Borehole Temperatures
- 5 Heat Flow measurements
- Thermal Conductivity

  Yr1 – 235 measurements (VTech)

Delaware

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- 11,660 Water Well logs
- 38 Oil and Gas Well logs
- 18 Geologic Maps
- 49 Geothermal Publications
- 54 Geologic Units
- 51 Borehole Temperatures
- 5 Heat Flow measurements
- 235 Thermal Conductivity measurements

**Problems: Minimal deep wells = lack of good temperature data

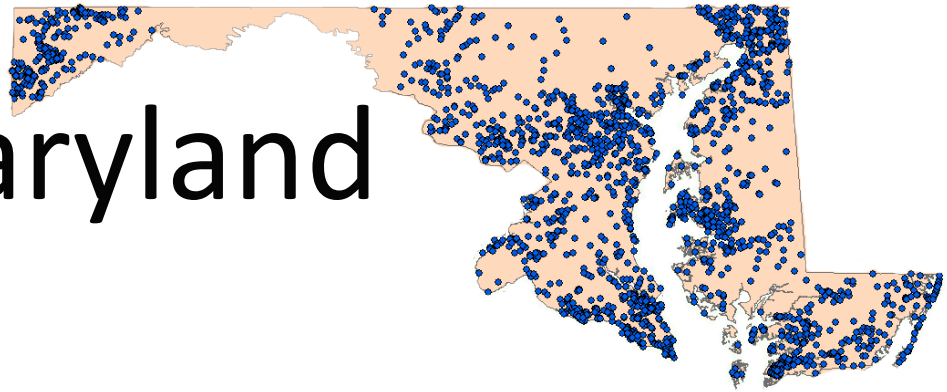
Delaware Maryland

Data Submitted to the NGDS:

- 101 Geothermal Well logs
- 11,660 Water Well logs
- 38 Oil and Gas Well logs
- 18 Geologic Maps
- 49 Geothermal Publications
- 54 Geologic Units
- 51 Borehole Temperatures
- 5 Heat Flow measurements
- 235 Thermal Conductivity measurements

**Problems: Minimal deep wells = lack of good temperature data

Maryland



<u>Data Submitted to the NGDS</u>:

- 107 Geothermal Well logs
- Water Well logs

Yr1 – 201 wells, 491 logs (MGS publications, MGS catalog)

Yr2 – 241 wells, 285 logs (USGS online National Water Information System/MGS catalog)

Yr3 – 1925 wells, 1928 logs (USGS online National Water Information System/MGS catalog)

**Problems: Meshing well records from independent databases

Wells lacking coordinates

Data access limited – for purchase only via MGS

Maryland

<u>Data Submitted to the NGDS</u>:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- Oil and Gas Well logs

  Yr1 – 109 wells, 165 logs (MGS)

  Yr2 – 65 wells, 321 logs (MGS/MDE)

  Yr3 – 40 wells, 40 logs (MDE)

Maryland

<u>Data Submitted to the NGDS</u>:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- Geologic Maps

  Yr1 – 70 maps (MGS/USGS)

Maryland

<u>Data Submitted to the NGDS</u>:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- 70 Geologic Maps
- Geothermal Publications

  92 publications referenced (MGS/VTech)

Maryland

<u>Data Submitted to the NGDS</u>:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- 70 Geologic Maps
- 92 Geothermal Publications
- Geologic Units

  Yr1 – 93 lithologic descriptions (USGS online spatial data)

Maryland

Data Submitted to the NGDS:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- 70 Geologic Maps
- 92 Geothermal Publications
- 93 Geologic Units
- Bottom Hole Temperatures

  Yr1 – 46 measurements (VTech/MGS)

  Yr2 – 67 measurements (MGS/MDE)

  Yr3 – 15 measurements (VTech/MGS)

Maryland

Data Submitted to the NGDS:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- 70 Geologic Maps
- 92 Geothermal Publications
- 93 Geologic Units
- 128 Bottom Hole Temperatures
- Heat Flow measurements

  Yr1 – 19 measurements (VTech)

Maryland

<u>Data Submitted to the NGDS</u>:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- 70 Geologic Maps
- 92 Geothermal Publications
- 93 Geologic Units
- 128 Bottom Hole Temperatures
- 19 Heat Flow measurements
- Thermal Conductivity

  Yr1 – 898 measurements (VTech)

Maryland

<u>Data Submitted to the NGDS</u>:

- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- 70 Geologic Maps
- 92 Geothermal Publications
- 93 Geologic Units
- 128 Bottom Hole Temperatures
- 19 Heat Flow measurements
- 898 Thermal Conductivity
- Thermal Springs

  Yr1 – 1 spring (MGS)

Maryland

Data Submitted to the NGDS:

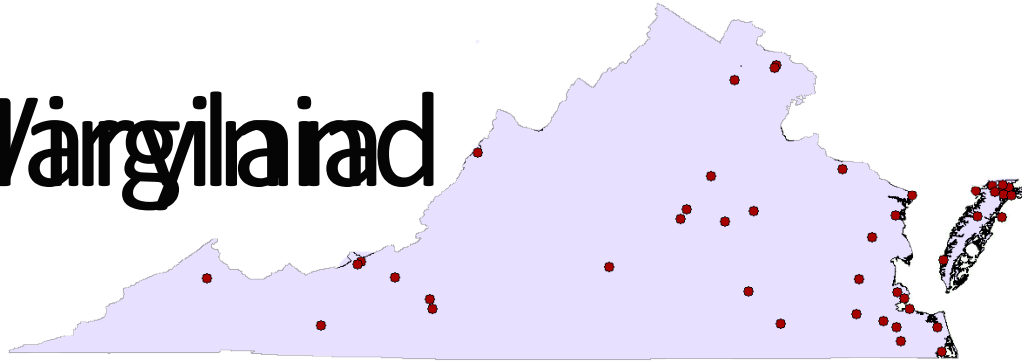
- 107 Geothermal Well logs
- 2,704 Water Well logs
- 526 Oil and Gas Well logs
- 70 Geologic Maps
- 92 Geothermal Publications
- 93 Geologic Units
- 128 Bottom Hole Temperatures
- 19 Heat Flow measurements
- 898 Thermal Conductivity
- 1 Thermal Spring description

*Meshing well records from independent databases

*Wells lacking coordinates

*Data access limited – for purchase only via MGS

Virginia

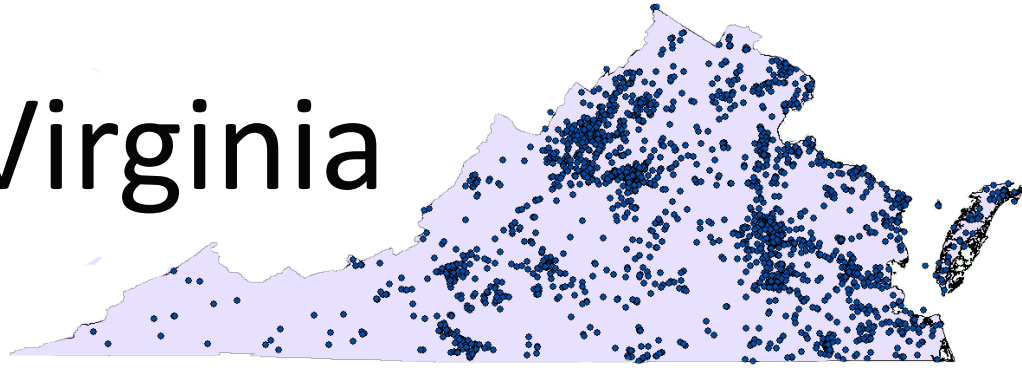


Data Submitted to the NGDS:

- Geothermal Well logs
  - Yr1 – 48 wells, 222 logs (VTech)
  - Yr2 – 5 wells, 14 logs (VTech)
  - Yr3 – 11 wells, 49 logs (USGS, DEQ)
- 92 Geothermal Publications
- 93 Geologic Units
- 128 Bottom Hole Temperatures
- 19 Heat Flow measurements
- 898 Thermal Conductivity
- 1 Thermal Spring description

107 Geothermal Well logs
2,704 Water Well logs
526 Oil and Gas Well logs
Geologic Maps

Virginia



<u>Data Submitted to the NGDS</u>:

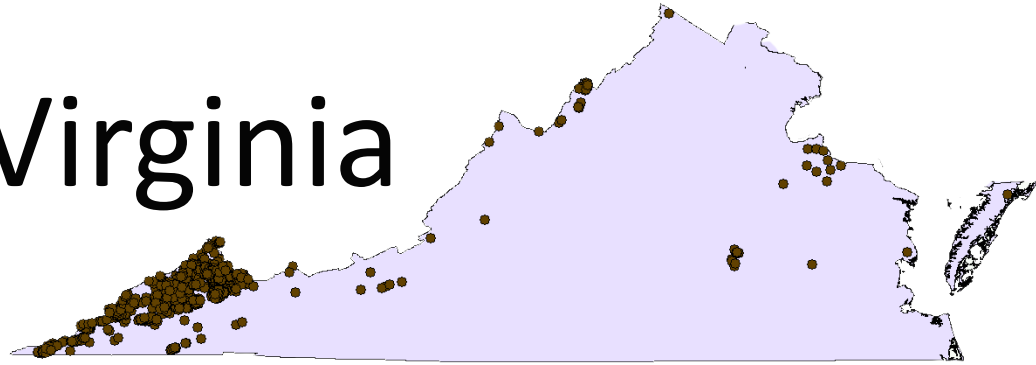
- 285 Geothermal Well logs
- Water Well logs

  Yr1 – 247 wells, 762 logs (DGMR publications, DEQ database)

  Yr2 – 648 wells, 978 logs (DGMR publications, DEQ database)

  Yr3 – 1560 wells, 1732 logs (DGMR publications, DEQ databse)

Virginia



<u>Data Submitted to the NGDS</u>:

- 285 Geothermal Well logs
- 3472 Water Well logs
- Oil and Gas Well logs

  Yr1 – 319 wells, 900 logs (DGO database)

  Yr2 – 203 wells, 501 logs (DGO database)

  Yr3 – 886+ wells, 1708+ logs (DGO database)

**Additional wells and logs exist - Division of Gas and Oil database

Virginia

<u>Data Submitted to the NGDS</u>:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- Geologic Maps

  Yr1 – 160 maps (DGMR)

  Yr2 – 5 maps (DGMR)

Virginia

<u>Data Submitted to the NGDS</u>:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- Geothermal Publications

  112 publications referenced (DGMR, USGS, etc.)

Virginia

<u>Data Submitted to the NGDS</u>:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- Geologic Units

  Yr1 – 356 lithologic descriptions (DGMR, USGS online integrated geologic map database)

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- Geochemistry

  Yr2 – 98 geochemical analyses (DGMR)

**Problems: Database inaccuracies

Virginia

<u>Data Submitted to the NGDS</u>:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- Thermal Conductivity

  Yr1 – 1493 thermal conductivity measurements (VTech)

  Yr2 – 249 thermal conductivity measurements (VTech)

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- Bore Hole Temperature Measurements

  Yr1 – 221 BHTs (DGMR, DGO, DEQ, VTech)

  Yr2 – 468 BHTs (DGMR, DGO, DEQ, VTech)

  Yr3 – 1173 BHTs (DGMR, DGO, DEQ)

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- Thermal Springs Data

  Yr1 – 81 Thermal Springs descriptions (DGMR)

  Yr3 – 2 Thermal Springs descriptions (WVU)

Virginia

<u>Data Submitted to the NGDS</u>:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- Aqueous Chemistry

  Yr2 – 74 chemical analyses (DGMR, USGS, DEQ)

Virginia

<u>Data Submitted to the NGDS</u>:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- 74 Aqueous Chemistry analyses

- Heat Flow Data

  Yr1 – 35 measurements (VTech)

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- 74 Aqueous Chemistry analyses
- 35 Heat Flow measurements
- Gravity Station Data

  Yr2 – 9,330 measurements

**Additional data exists – DGMR publications

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- 74 Aqueous Chemistry analyses
- 35 Heat Flow measurements
- 9,330 Gravity Station measurements
- Gravity Maps

  Yr2 – 10 maps

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- 74 Aqueous Chemistry analyses
- 35 Heat Flow measurements
- 9,330 Gravity Station measurements
- 10 Gravity Maps
- Buried Radiogenic Intrusives
  - Yr2 – 24 descriptions

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- 74 Aqueous Chemistry analyses
- 35 Heat Flow measurements
- 9,330 Gravity Station measurements
- 10 Gravity Maps
- 24 Buried Intrusive descriptions
- Heat Pump Facilities

  Yr3 – 692 installations

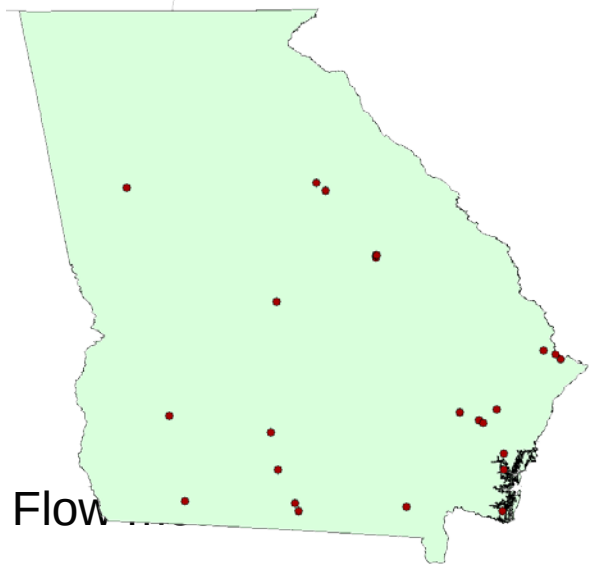
**Exact coordinates unobtainable, additional data exists!

Virginia

Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- 74 Aqueous Chemistry analyses
- 35 Heat Flow measurements
- 9,330 Gravity Station measurements
- 10 Gravity Maps
- 24 Buried Intrusive descriptions
- 692 Heat Pump Facilities

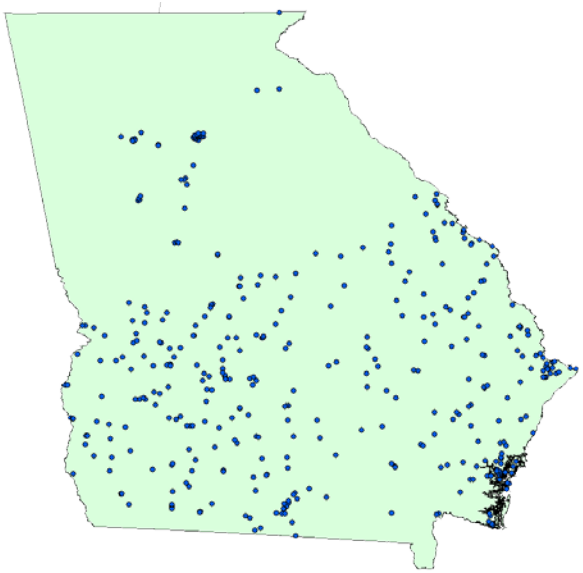
Virginia



Data Submitted to the NGDS:

- 285 Geothermal Well logs
- 3472 Water Well logs
- 3109 Oil and Gas Well logs
- 165 Geologic Maps
- 112 Geothermal Publications
- 356 Geologic Units
- 98 Geochemical measurements
- 1742 Thermal Conductivity
- 1862 Bore Hole Temperature Measurements
- 83 Thermal Springs Data
- 74 Aqueous Chemistry analyses
- 35 Heat Flow
- 9330 Gravity Station measurements
- 10 Gravity Maps
- 24 Buried Intrusive descriptions
- 692 Heat Pump Facilities

Georgia



<u>Data Submitted to the NGDS</u>:

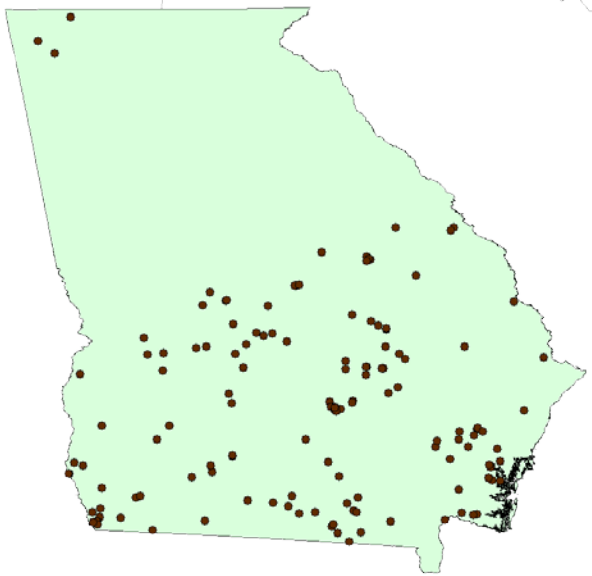
- 24 Geothermal Well logs
- Water Well logs

  Yr2 – 218 wells, 1150 logs (GGS publications, USGS NWIS database, USGS GeoLogs database)

  Yr3 – 400+ wells, 1229 logs+ (USGS, GGS publications)

**Additional data exists – lack of dates, coordinates, or other supporting information

Georgia



<u>Data Submitted to the NGDS</u>:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- Oil and Gas Well logs

  Yr1 – 119 wells, 329 logs (GA EDP)

  Yr2 – 10 wells, 14 logs (GA EPD, GGS)

  Yr3 – 109 wells, 424 logs (USGS)

**Some additional logs exists, but must be scanned – GA EPD

Georgia

<u>Data Submitted to the NGDS</u>:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- Geologic Maps

  Yr1 – 27 maps (USGS, GA EPD)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- Geothermal Publications

  63+ publications referenced (GGS, VTech, USGS)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- Geologic Units

  171 lithologic descriptions (USGS)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- Geochemistry

  Yr1 – 100 geochemical analyses (VTech)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- Thermal Conductivity

  176 measurements (VTech)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- Borehole Temperature measurements

  Yr1 – 93 measurements (VTech, GGS)

  Yr2 – 239 measurements (USGS-EPD)

  Yr3 – 143+ measurements (USGS-EPD)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- 475 Borehole Temperature measurements
- Thermal Springs

  7 descriptions of thermal springs (USGS)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- 475 Borehole Temperature measurements
- 7 Thermal Springs
- Heat Flow Data

  Yr1 – 6 calculations (VTech)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- 475 Borehole Temperature measurements
- 7 Thermal Springs
- 6 Heat Flow calculations

- Gravity Station Data

  Yr2 – 59 measurements (GGS)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- 475 Borehole Temperature measurements
- 7 Thermal Springs
- 6 Heat Flow calculations
- 59 Gravity Station measurements
- Gravity Maps
  - Yr2 – 8 maps (GGS, VTech)
  - Yr3 – 1 map (USGS)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- 475 Borehole Temperature measurements
- 7 Thermal Springs
- 6 Heat Flow calculations
- 59 Gravity Station measurements
- 9 Gravity Maps
- Buried Intrusives

  Yr2 – 10 descriptions (VTech)

Georgia

Data Submitted to the NGDS:

- 24 Geothermal Well logs
- 2379+ Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- 475 Borehole Temperature measurements
- 7 Thermal Springs
- 6 Heat Flow calculations
- 59 Gravity Station measurements
- 9 Gravity Maps
- 10 Buried Intrusive descriptions

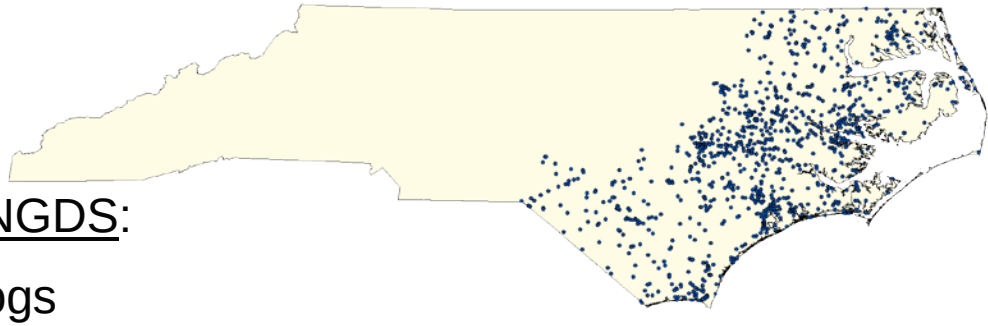
**limited data outside Coastal Plain, additional data exists

North Carolina

Data Submitted to the NGDS:

- 24 Geothermal Wells
- 2376 Water Well logs
- 767 Oil and Gas Well logs
- 27 Geologic Maps
- 63 Geothermal Publications
- 171 Geologic Units
- 100 Geochemical measurements
- 176 Thermal Conductivity measurements
- xxx Borehole Temperature measurements
- 7 Thermal Springs
- 6 Heat Flow calculations
- 26 Water Well logs (VTech)
- 59 Gravity Station measurements
- 9 Gravity Maps
- 10 Buried Intrusive descriptions

North Carolina

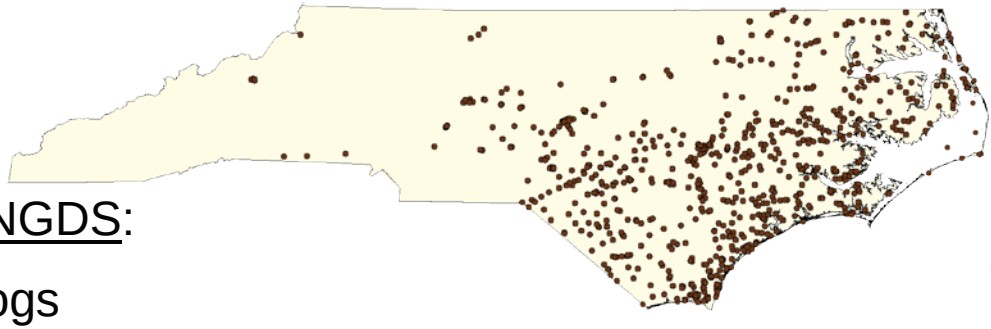


<u>Data Submitted to the NGDS</u>:

- 75 Geothermal Well logs
- Water Well logs

  1175+ wells, 3279+ logs (NCDENR Ground Water Database)

North Carolina



<u>Data Submitted to the NGDS</u>:

- 75 Geothermal Well logs
- 3279+ Water Well logs
- Oil and Gas logs

  877+ wells, 212+ logs (NCGS)

** Still in progress!

North Carolina

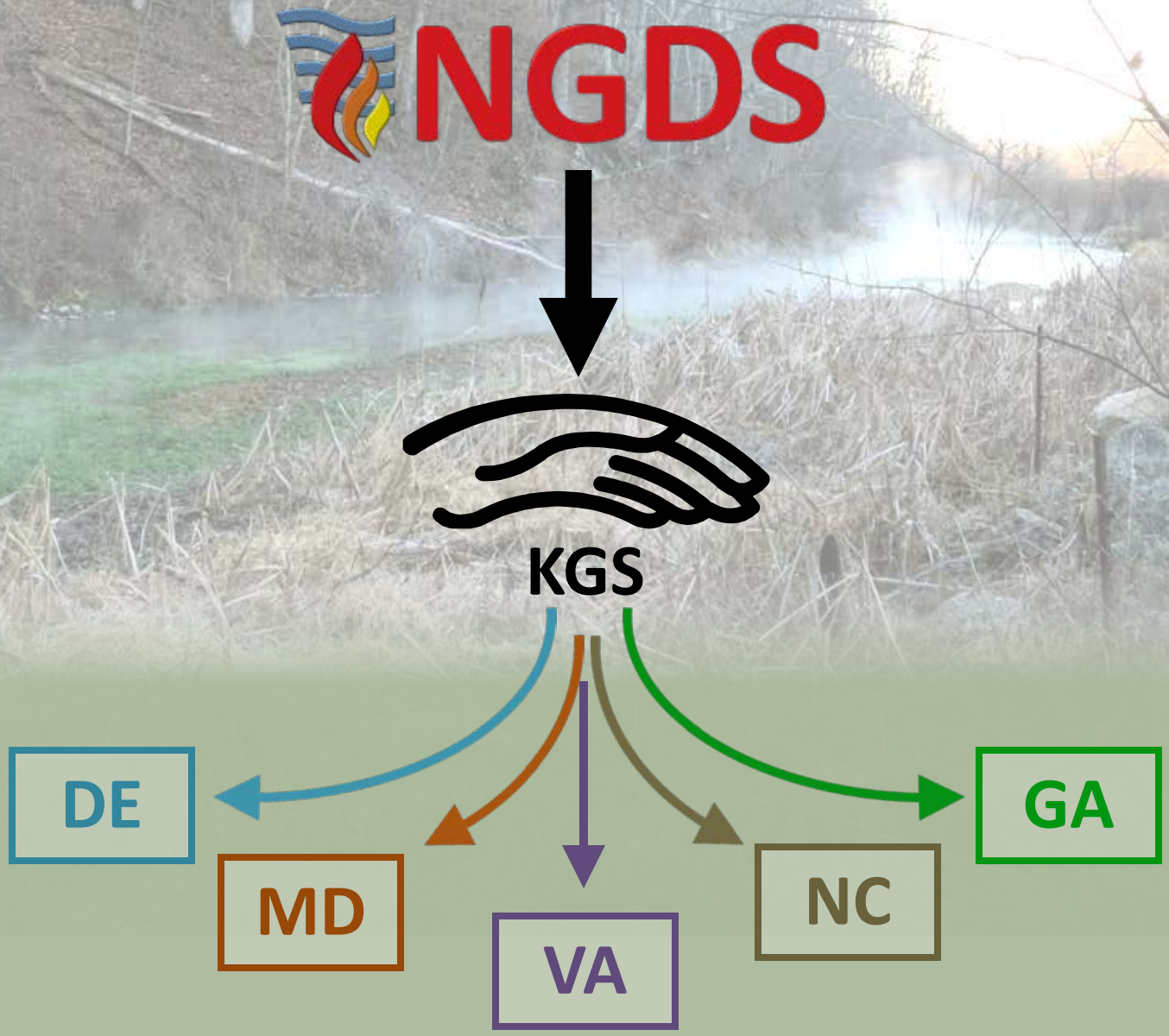
Data Submitted to the NGDS:

- 75 Geothermal Well logs
- 3279+ Water Well logs

Upcoming:

- 212+ Oil and Gas logs
- 75+ Geothermal Publications
- 200± Geologic Maps
- 1± Geochemical measurements
- 1058± Thermal Conductivity measurements
- 40± Borehole Temperature measurements
- 1± Thermal Springs
- 9± Geologic Units
- 13± Heat Flow calculations
- 9± Buried Intrusives
- 2± Gravity Maps
- 217± Gravity Station Data

Obtaining Your Data From The



NGDS National Geothermal Data System

Geothermaldata.org

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NGDS Featured in May 2013 Scientific American article

Decades-Old Documents Could Speed Discovery of Geothermal Wells

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- USGIN Tutorials
- Using Apps

SHARE DATA

Becoming a data provider to the NGDS is simple. To learn more about contributing your project's data to the DOE Geothermal Data Repository, data interchange formats, and data services follow the links below:

PARTICIPANTS

AASG — Association of American State Geologists

SMU — Southern Methodist University

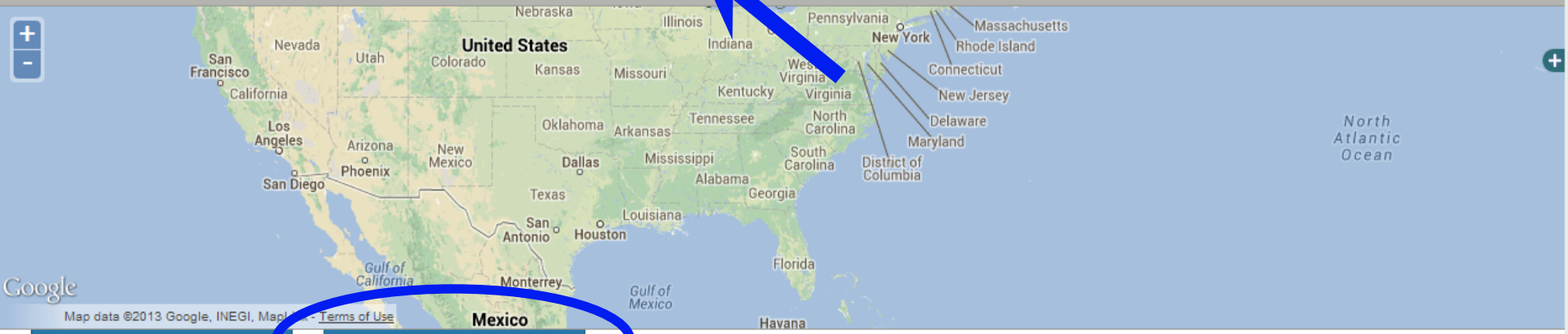
BOISE STATE — Boise State University

USGS — U. S. Geological Survey

NGDS National Geothermal Data System

Georgia well

Search



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Results 16 total results Next 6 Results >

More Details
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Full XML Metadata

Access Options

- Add WMS to Map
- Add ESRI Service to Map
- Add to ArcMap
- Preview Data Table
- Zipped Excel Spreadsheet Containing Georgia Well Log Observation Data
- WMS Capabilities
- WFS Capabilities
- ESRI Service Endpoint
- Contact Distributor

Georgia Well Log Observation Data

This resource is a compilation of Georgia Well Log observations compiled by the Virginia Division of Geology and Mineral Resources, published as a Web feature service for the AASG National Geothermal Data System. The data is available in the following for...

By Virginia Division of Geology and Mineral Resources - Published on Wed Feb 01 2012 - Modified on Fri Jul 26 2013

Keywords: Geology Geothermal template well well logs Georgia North America United States Well Log Observation Data Downloadable Files ESRI Services WMS Services WFS Services Georgia Geological Survey

Well Logs of the Coastal Plain of Georgia

Bulletin on the well logs of the Coastal Plain in Georgia.This resource is available for purchase at the Environmental Protection Division, Georgia Department of Natural Resources. This document is available as a pdf; Contact the Environmental Protection ...

By Herrick, S.M. - Published on Sun Jan 01 1961 - Modified on Wed Sep 26 2012

Keywords: Well Logs Coastal Plain North America Georgia Offline Access Georgia Geological Survey

Georgia Heat Flow 1.23

This is the most current dataset and uses schema version 1.23. The other Georgia Heat Flow dataset will eventually be depreciated. This dataset is a compilation of heat flow measurements and calculations compiled by the Georgia Department of Natural Resou...

By Virginia Department of Mines, Minerals and Energy, Division of Geology and Mineral Resources - Published on Wed Mar 20 2013 - Modified on Thu Mar 21 2013

Keywords: Georgia Well Temperature Heat Flow Ground Water Geothermal Geology WMS Services WFS Services ESRI Services Downloadable Files Georgia Geological Survey

Georgia Borehole Temperatures

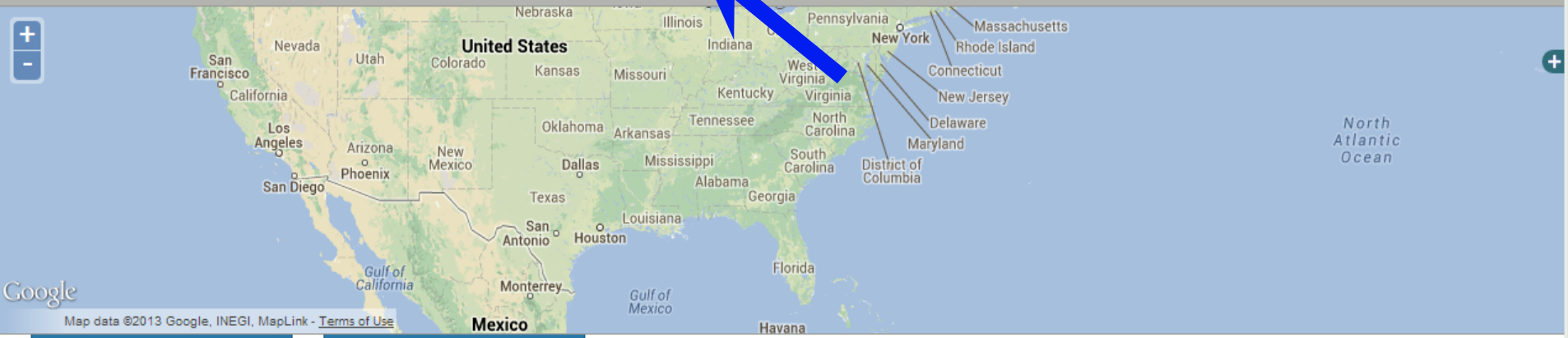
This resource is a compilation of Georgia Borehole Temperature observations compiled by the Virginia Division of Geology and Mineral Resources, published as a Web feature service for the AASG National Geothermal Data System. The data is available in the f...

By Virginia Division of Geology and Mineral Resources - Published on Wed Oct 05 2011 - Modified on Tue Jun 25 2013

NGDS National Geothermal Data System

Georgia well

Search



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Define A Search Area

Results 16 total results Next 6 Results >

More Details
Show Area on Map
Full XML Metadata

Access Options

- Add WMS to Map
- Add ESRI Service to Map
- Preview Data Table
- Zipped Excel Spreadsheet Containing Georgia Well Log Observation Data
- WFS Capabilities
- ESRI Service Endpoint
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Georgia Well Log Observation Data

This resource is a compilation of Georgia Well Log observations compiled by the Virginia Division of Geology and Mineral Resources, published as a Web feature service for the AASG National Geothermal Data System. The data is available in the following for...

By Virginia Division of Geology and Mineral Resources - Published on Wed Feb 01 2012 - Modified on Fri Jul 26 2013

Keywords: Geology, Geothermal, Template, well, well logs, Georgia, North America, United States, Well Log Observation Data, Downloadable Files, ESRI Services, WMS Services, WFS Service

Well Logs o

Bullet Protection Division, Georgia Depar

By Herr

Keywor

Georgia Hea

This is be depreciated. This dataset is a compi

By Virg lified on Thu Mar 21 2013

Keywor adable Files, Georgia Geological Survey

Georgia Bor

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By Virg

Georgia Well Log Observation Data Data Preview

nLoggedInterval_ft	DateTimeLogRun	PaperCopyLocation	ScannedFileURL
	1900-01-01T00:00:00	Environmental Protection Division, Georgia Department of Natural Resources (GAEPD)	http://kgs.uky.edu/kgsweb/geothermal/ga/oilandgaswells/GGS-0011_Bull70.pdf
	1900-01-01T00:00:00	Environmental Protection Division, Georgia Department of Natural Resources (GAEPD)	http://kgs.uky.edu/kgsweb/geothermal/ga/oilandgaswells/GGS-0011_PALEO_580_5013.pdf

Copy of Combined_GA_Revised_WellLogObservationContentModel_schemamatch0.8.xls [Read-Only] [Compatibility Mode] - Microsoft Excel

LogURI	OtherLogI	DisplayName	Notes	LogTypeTerm	LogTypeName	WellBoreURI	WellBoreN
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http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Resistivity | Temperature for		RES | TL	Resistivity |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0376/	C.E.P. Curry
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-0376_Bull70.pdf/		Borehole Lithology Log for		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0376/	C.E.P. Curry
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-0376_CAL_0_2050.tif/		Caliper for C.E.P. Curry No. 1		CAL	Caliper	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0376/	C.E.P. Curry
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-0376_NEU_0_2050.tif/		Neutron Porosity for C.E.P.		NPOR	Neutron Porosity	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0376/	C.E.P. Curry
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-0376_ELOG_0_2050.tif/		Resistivity for C.E.P. Curry No.		RES	Resistivity	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0376/	C.E.P. Curry
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential |		SP | RES | DIFL	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-3466/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Caliper | Bulk		GR | CAL | BD | N |	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-3466/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Spontaneous		GR | SP | CAL | AVL |	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-3466/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Caliper | Bulk		GR | CAL | BD |	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-3466/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential |		SP | CON	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-1197/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Caliper |		GR | CAL | AMPS	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-1197/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Caliper | Resistivity |		CAL | RES | MLAT	Caliper | Resistivity	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0724/	Union Bag C
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential |		SP | RES | CON	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0724/	Union Bag C
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential | Sonic		SP | SL	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0724/	Union Bag C
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Caliper | Bulk		GR | CAL | BD | CFD	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-1198/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential |		SP | CAL | BCS	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-1198/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Borehole Lithology Log for		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-1198/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Borehole Lithology Log for		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-1198/	Union Camp
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential |		SP | RES | LATL	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0362/	Roy H. Mass
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-0362_Bull70.pdf/		Borehole Lithology Log for Roy		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0362/	Roy H. Mass
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Borehole Lithology Log for Roy		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0362/	Roy H. Mass
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Borehole Lithology Log for Roy		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0362/	Roy H. Mass
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray for Roy H. Massey		GR	Gamma Ray	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0362/	Roy H. Mass
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Caliper | Microlaterolog for		CAL | MLAT	Caliper |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0719/	W.C. McDor
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential |		SP | RES | CON	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0719/	W.C. McDor
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential | Sonic		SP | SL	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-0719/	W.C. McDor
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Spontaneous Potential |		SP | RES | DIFL	Spontaneous	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-3365/	Scott & Mea
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Borehole Lithology Log for		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-3365/	Scott & Mea
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Caliper | Bulk		GR | CAL | BD |	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Glynn_GGS-3365/	Scott & Mea
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Spontaneous		GR | SP | BCS	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-3537/	Amoco-Pen
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Spontaneous		GR | SP | DISF	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-3537/	Amoco-Pen
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Caliper | Compensated		CAL | CNLD	Caliper |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-3537/	Amoco-Pen
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Spontaneous		GR | SP | CAL | BCS	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-3537/	Amoco-Pen
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Gamma Ray | Spontaneous		GR | SP | DISF	Gamma Ray |	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-3537/	Amoco-Pen
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Pressure for Amoco-		PR	Pressure	http://resources.usgin.org/uri-gin/gadnr/well/GA_Camden_GGS-3537/	Amoco-Pen
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-0062_Bull70.pdf/		Borehole Lithology Log for		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Chatham_GGS-0062/	Cherokee H
http://resources.usgin.org/uri-gin/gadnr/welllog/GGS-		Borehole Lithology Log for		LITH	Borehole Lithology	http://resources.usgin.org/uri-gin/gadnr/well/GA_Chatham_GGS-0062/	Cherokee H

About | Notes | DatasetMetadata | VellLogObservationContent | FieldList | DataValidTerms | AASG data log type codes

Ready

Thoughts for the Future

- All inclusive database per state
- Completing datasets –
  continuing to submit data to the NGDS
- Using the data to produce useful tools
  for industry, research, and the public

NGDS National Geothermal Data System

geothermaldata.org

MDE

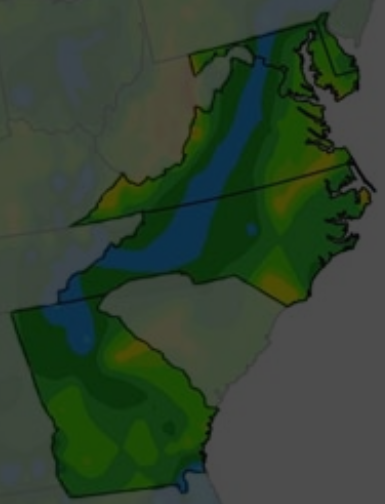
MARYLAND DEPARTMENT OF NATURAL RESOURCES

DMME Division of Geology & Mineral Resources

RESEARCH DELAWARE GEOLOGICAL SURVEY SERVICE EXPLORATION

DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

GEOLOGICAL SURVEY N.C. 1823



DMME Gas and Oil Division

USGS science for a changing world

EPD

GEORGIA DEPARTMENT OF NATURAL RESOURCES

SMU GEOTHERMAL LABORATORY