

STATE WELL REPORT

Part 1

Driller's Log

Mississippi Department of Environmental Quality
Office of Land and Water Resources
P.O. Box 2309
Jackson, MS 39225-2309
(601)961-5555
(601)961-5228 (fax)

For Office Use Only:

Well #: **H224**
Aquifer: _____
E-Log #: _____

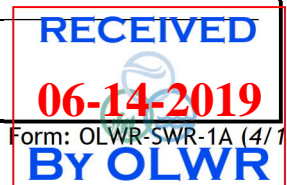
County: Sunflower
Permit #: _____
Driller: Roland W Tollett (RMO-00009026)
Date drilling completed: 5/21/2019

USGS site name: SF-02a-EC

State Law requires that this report be prepared by the license holder responsible for the work and filed with the Department at the above address within 30 days of completion of drilling of the well or borehole.

Well Owner Information (Landowner if borehole is not for a water well) Owner Name: <u>(landowner - Woods Eastland)</u> Mailing Address: <u>USGS (driller - rtollett@usgs.gov)</u> <u>3095 W. California Ave</u> Ruston LA 71270 City State Zip Code Telephone No. (<u>318</u>) <u>251-9630</u> (245-8639 cell)	<input checked="" type="checkbox"/> Well or <input type="checkbox"/> Borehole Location Latitude: <u>33.63993</u> Longitude: <u>-90.53530</u> Method of Lat/Long (check one): Conventional Survey _____, USGS quad _____, Hand-held GPS <u>X</u> , Survey-grade GPS _____ NW <u>1/4</u> SW <u>1/4</u> , Sec <u>32</u> T <u>21N</u> R <u>03W</u> <u>1.25</u> Miles <u>SE</u> of <u>Doddsville, MS</u> (Distance) (Direction) (Nearest Town)
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Well / Borehole Data	
Date drilling started: <u>5/21/2019</u> Date drilling completed: <u>5/21/2019</u> Hole depth: <u>93 ft bls</u> Hole diameter: <u>3.25 in</u>	
Location of the source of any surface water used for drilling: <u>none used</u>	
Method of dosing and volume of Chlorine used in drilling and development: <u>none used</u>	
Logs run (check applicable): <input type="checkbox"/> No log run <input checked="" type="checkbox"/> Electric <input type="checkbox"/> Gamma Ray <input type="checkbox"/> Density <input type="checkbox"/> Sonic <input type="checkbox"/> Neutron <input type="checkbox"/> Other: _____	
Name of organization running log(s): <u>USGS, 3095 W. California Ave, Ruston, LA 71270 (318) 251-9630 x13</u>	
Purpose of borehole (check one): <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Geotechnical/Geological Investigation <input type="checkbox"/> Ground Source Heat Pump <input type="checkbox"/> Seismic Survey <input type="checkbox"/> Other (describe) _____	
If drilling is not related to water well construction, skip the remainder of this block	
Purpose of Well (check all applicable): <input type="checkbox"/> Home <input type="checkbox"/> Industrial <input type="checkbox"/> Public Supply <input type="checkbox"/> Irrigation <input type="checkbox"/> Fish Culture <input checked="" type="checkbox"/> other	
Other (describe): <u>monitoring well</u>	
If a flowing well, method of flow regulation: Valve _____ Other (describe) _____	
Static Water Level: <u>47.57</u> feet <input type="checkbox"/> above or <input checked="" type="checkbox"/> below land surface Date measured: <u>5/23/2019 @ 0830</u> (check one)	
Method of measurement (check one) <input type="checkbox"/> Steel tape <input checked="" type="checkbox"/> Electric tape <input type="checkbox"/> Air line <input type="checkbox"/> Other (describe): _____	
Well depth: <u>79.5</u> Well grouted to a depth of: <u>30</u> feet Type of grout (check one): <input checked="" type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Mix	
Casing length: <u>69.5</u> feet Casing diameter: <u>2</u> inches Type of casing: <u>PVC</u>	
Screen length: <u>10</u> feet Screen diameter: <u>2</u> inches Type of screen: <u>PVC</u>	
Screen slot size: <u>0.010</u> inches Setting depth: From <u>69.5</u> feet to <u>79.5</u> feet	
Type of completion (check all applicable): <input type="checkbox"/> Gravel packed <input type="checkbox"/> Underreamed <input type="checkbox"/> Open hole <input checked="" type="checkbox"/> Natural Development	
Other (describe): _____	
Top of lap pipe or reduction in casing: <u>NA</u> feet	
If telescoped or more than one screen, describe on next page	



STATE WELL REPORT

Part 2

Pump Installer's Completion Report
 Mississippi Department of Environmental Quality
 Office of Land and Water Resources
 P.O. Box 2309
 Jackson, MS 39225-2309
 (601)961-5210
 (601) 360-0535 (fax)

For Office Use Only:

Well #: **H224**

 Aquifer: _____

County: Sunflower
 Permit #: _____
 Driller: _____
 Date completed: _____
Copy information from block on Part 1

This part of the report must be completed by a licensed water well contractor or a licensed pump installer. A copy of Part 1 of the report must be attached and both parts filed with the Department at the above address within 30 days of well completion.

Well Owner Information	Well Location
Owner Name: _____	Latitude: _____ Longitude: _____
Mailing Address: _____ _____	Method of Lat/Long (check one): Conventional Survey_____, USGS quad_____, Hand-held GPS_____, Survey-grade GPS_____ _____ 1/4 _____ 1/4, Sec _____ T _____ R _____ _____ Miles _____ of _____ (Distance) (Direction) (Nearest Town)
City _____ State _____ Zip Code _____	
Telephone No. (_____) _____	

Pump Type (check one)

Submersible Turbine Air Lift Centrifugal Flowing Well Jet Piston Rotary Other (describe): _____

Date Pump Installed: _____ Rated Pump Capacity: _____ Gallons Per Minute

Is This Pump (check one): New Repaired Replacement

Power Type (check one)

Electric Diesel Gasoline Natural Gas Tractor PTO Windmill Other (describe): _____

Horse Power Rating of Motor: _____ Setting Depth: _____ feet Number of Stages: _____

Pump Test Data for Non Flowing Well

Date Well Tested: _____ Duration of Pump Test (minimum 4 hours): _____ hours

Static Water Level (A): _____ Feet Below Land Surface Pumping Water Level (B): _____ Feet Below Land Surface

Drawdown [(B) - (A)]: _____ Feet Below Land Surface Test Pumping Rate: _____ Gallons Per Minute

Method of measurement (check one): Steel tape Electric tape Air line Other (describe): _____

Pump Test Data for Flowing Well

Measured shut in head: _____ feet.

Well yielded _____ GPM with a drawdown of _____ feet after _____ hours of pumping

Meter Installation

Meter Manufacturer: _____ Meter Serial Number: _____

Meter Model Number/Name: _____ Type of Meter: _____

Totalizer Register Unit and Multiplier Factor (AF x .001, gal x 1000, etc): _____

Installation Date: _____ Meter installed by: _____

Is This Meter (check one): New Repaired Replacement

Important: By submitting the above information you are certifying that this meter was installed to manufacturer standards. For agricultural wells, a list of approved meters is on the MDEQ website.

I HEREBY CERTIFY that the above statements are true to the best of my knowledge.

Print Name of Pump Installer and License No. (if applicable) _____ Date _____ Signature of Pump Installer _____



Driller: Roland W Tollett, USGS, 3095 W California Ave, Ruston, LA 71270 [318-245-8639] (MS LIC RMO-00009026)

Site number: <MDEQ no> Leflore SF-02a-EC

Drill date: 20190521 to 20190522

Plugged date: active monitoring well

Site type: USGS monitoring well

EC-HPT log depth: 93 ft bls

Monitoring well depth: 79.5 ft bls

Rig Type: Geoprobe 7822DT with EC-HPT probe (note: cores collected at well SF-02b six feet NW of this well)

Lat/Long 33.63993 -90.53530 (+- 9ft)

Sec Township Range: NW1/4,SW1/4,S32,T21N,R03W

Land surface elevation: 39.0 meters (128 feet; accuracy 1.6 ft) [data source: DEM]

Topo Map Name: Ruleville, MS

County/Parish: 083 Leflore County, MS (1:24,000)

HUC code: 080302070506 Gorman Lake-Big Sunflower

MAPS site_no for NWIS: 333824090320701

Land owner: James Eastland (famer) Woods Eastland (owner)



***** USER NOTES *****

Drilled by Roland (USGS Ruston LA) and Wesley Bolton (USDA ARS Oxford MS).

Driller notes (ROP is rate of penetration; TOC is top of 2" PVC casing):

SF-02: Wesley Bolton (USDA-ARS) and Roland W Tollett (USGS) pushed this log. Conditions were excellent (a bit windy but nice). There is a second, shallower well (<MDEQ no> Leflore SF-02b-EC) on site for water-quality sampling.

5ft to 37ft bls were mostly clay with some silty zones. We saw a brown clay on the rod wiper which is typically found in the shallower intervals.

37ft to 47ft bls - noticed some aquifer heavying in the dissipation test from this interval. Likely a sandy silty interval.

Noticeable change at 48 ft bls. Likely a nice medium sand as the Geoprobe had a slight shake, tight feel during hammering/pushing. There appears to be a single clay lens at 60 ft bls, but the full interval pushed similar (48-94 ft bls). Cores will also be collected at this site.

HPT log: The last 3 dissipation tests produced a theoretical water level of about 47.8 ft bls which matched the measured WLs very well. However, the 2 dissipation tests taken in the shallower zone between 38 and 55 ft bls indicated a theoretical water level of about 29 ft bls, but this was not observed by the measured water levels in the 2 wells.

Well construction: This 2" PVC monitoring well is ~82.5 ft from bottom of point to TOC with a 10 ft screen; screened interval is ~69.5-79.5 ft bls; MP is 3.00 above land surface with aluminum protective riser and 2 ft radius concrete slab; a 4" point was added to btm of casing; about 10 gallons of tap water were poured into PVC casing prior to pulling rods; this technique was used to balance and equalize pressure.

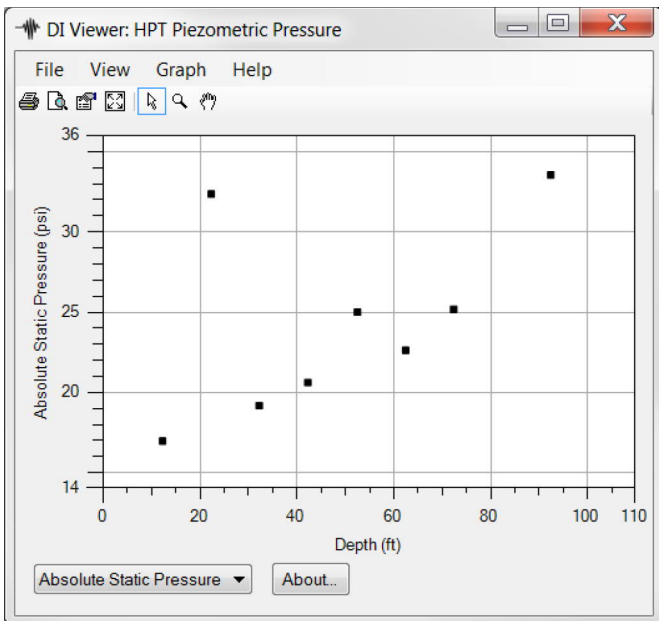
About 2 cups of bentonite granules were poured into the annular space of the borehole and bridged over around 30 ft below land surface (bls). Portland cement at a tap water ratio of 5-6 gals per 92-lb bag was used to seal the borehole from about 30 ft bls to land surface.

Water level:

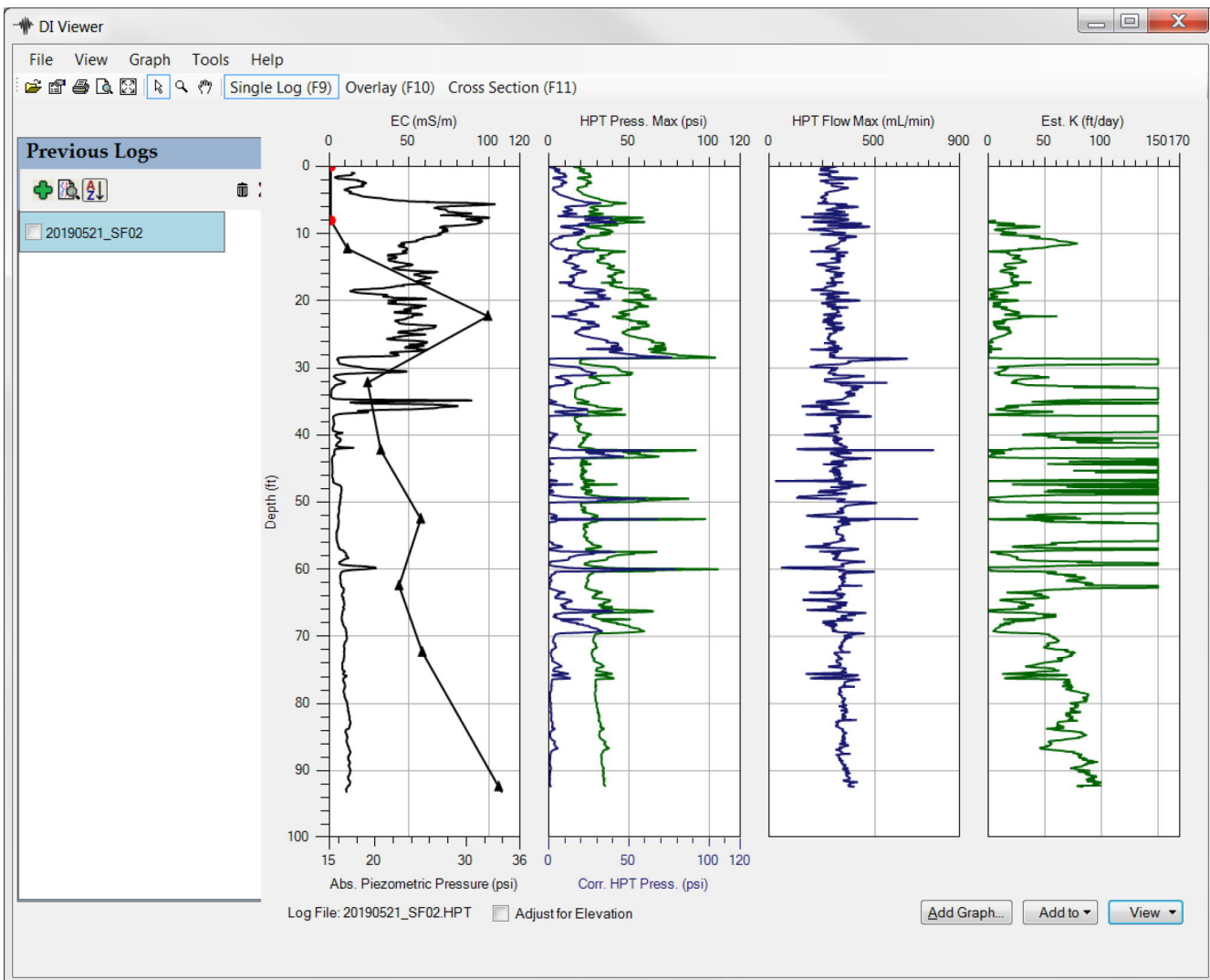
5/23/19 @ 0830 = 51.57 - 1.00 - 3.00 = 47.57 ft bls measured with e-tape by Roland W Tollett of the USGS

USGS SF-02a-EC (continued)

Figure 1. Graph of all 8 dissipation tests and EC-log showing 8 dissipation points from both the unsaturated and saturated zones.



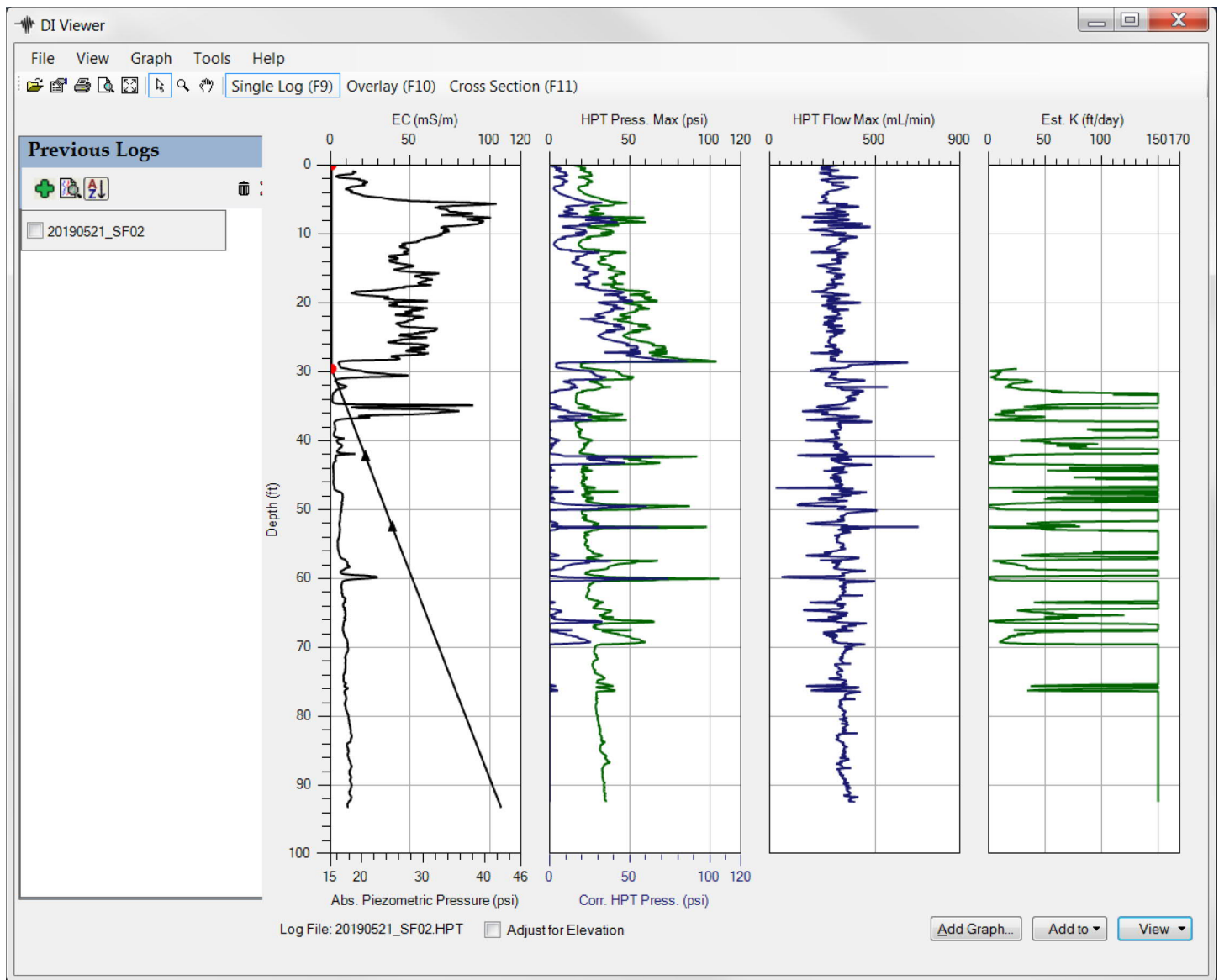
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USGS SF-02a-EC (continued)

Figure 2. Interpretation 1: Graph of dissipation tests and EC-log showing 2 dissipation points and the associated calculated estimated hydraulic head. The water level was estimated to be ~29 ft below land surface from these 2 dissipation tests (sand from 38-58 ft bls; WL on 4/29/19 = 47.57 ft bls).

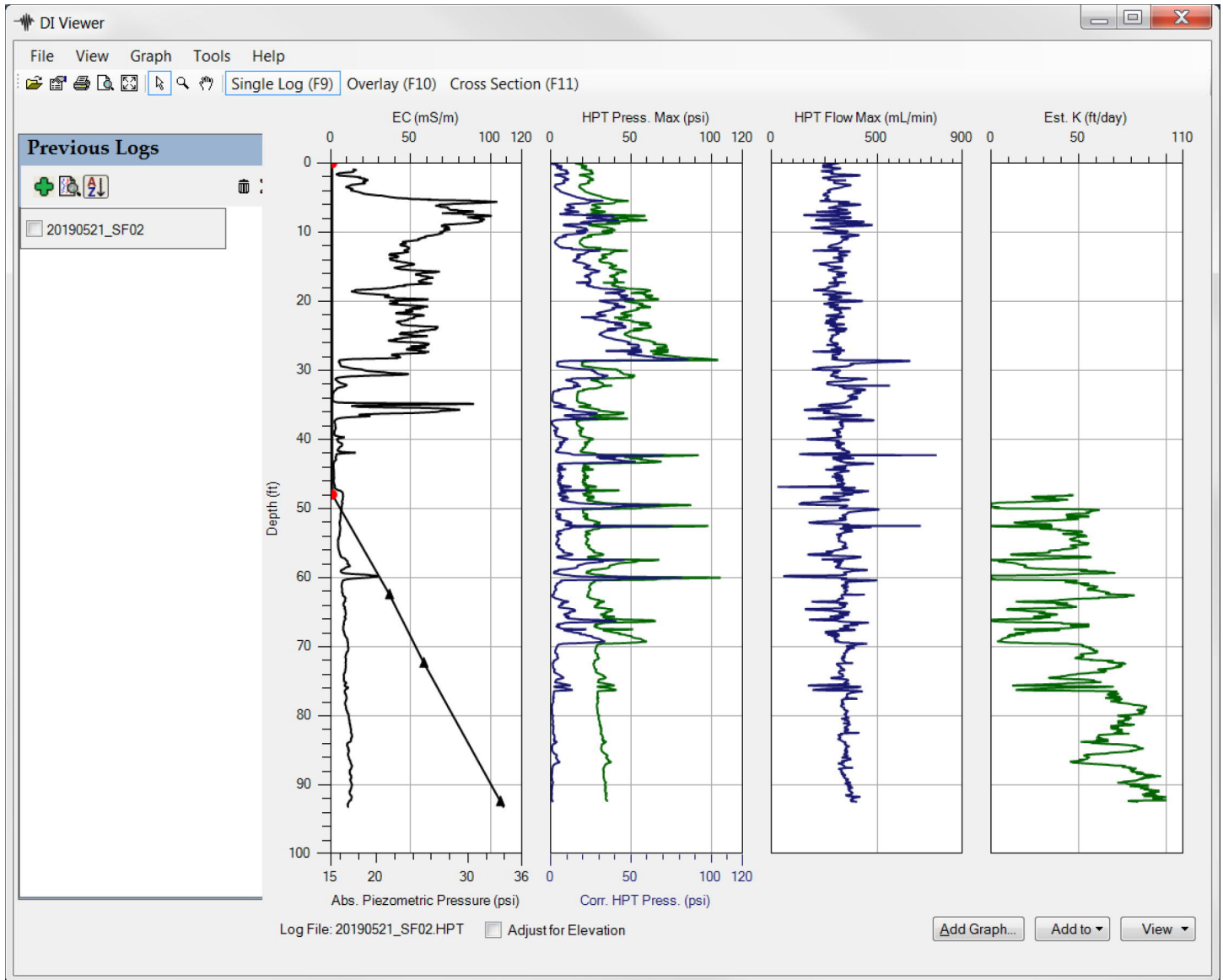
The clay lens from 59 to 61 ft bls appears to be significant because two hydraulic heads slopes are seen on the HPT log. However, the water levels for the 2 wells are almost identical (47.57 and 47.56), which suggest that the heads in the two sands are connected. This well was odd, as I am not quite sure why the estimated head was 29 ft bls for these 2 dissipation points. Perhaps the sand from 38 to 45 ft was moist but not full saturated.



USGS SF-02a-EC (continued)

Figure 3. Interpretation 2: Graph of dissipation tests and EC-log showing the last 3 dissipation points and the associated calculated estimated hydraulic head. The water level was estimated to be ~47.5 ft below land surface from these 3 dissipation tests (sand from 61-93 ft bls; WL on 5/23/19 = 47.57 ft bls).

The deeper dissipation points produced a theoretical water level that matched the actual water levels measured in both this well and the shallower well (SF-02b-EC) next to it.



USGS SF-02a-EC (continued) – Log file from Geoprobe software

20190521_SF02.zip

SITE INFORMATION -- DIRECT IMAGE HPT PROBE

Geoprobe DI Acquisition Software for Windows

Version: 3.2 Build: 18113

Pre-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Test 1	195.0	198.9	2.0	PASS
Test 2	97.0	98.2	1.3	PASS
Test 3	24.0	23.8	0.8	PASS

COMPANY: Geoprobe

OPERATOR: rtollett

PROJECT ID: usgs_office

CLIENT: USGS

UNITS: ENGLISH

PROBE AND ARRAY: K6050 HPT Probe with Wenner

LOCATION: LA

100 INCH STRING POT USED

ROD LENGTH: 5 feet

PRE-LOG HPT REFERENCE TEST VALUES

PRE TEST TIME: Tue May 21 2019 10:52:27

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	15.557	0.0	107.260
TOP with FLOW>0	15.907	295.4	109.670
BOTTOM with FLOW=0	15.323	0.0	105.650
BOTTOM with FLOW>0	15.677	295.1	108.090

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%

ACTUAL FLOW=0 HPT DIFF.: 0.23 psi (1.6 kPa)

TRANSDUCER TEST PASSED

HPT IDEAL COEFFS: 2.2696e1,-2.2356

HPT SENSOR CAL NUMBERS: XD30959A,0.0000,0.0000,0.0000,0.0000,9.9490e-1,-1.3100

LOG START TIME: Tue May 21 2019 10:58:17

LOG END DEPTH: 92.40 ft (28.164 m)

LOG END TIME: Tue May 21 2019 12:09:51

LATITUDE: 33.639950000

LONGITUDE: 90.535400000

ELEVATION: 0.000 METERS 0.00 FEET

GPS Quality: Manual

POST-LOG HPT REFERENCE TEST VALUES

POST TEST TIME: Tue May 21 2019 12:34:16

TEST	HPT PRESSURE (psi)	FLOW (mL/min)	HPT PRESSURE (kPa)
TOP with FLOW=0	15.575	0.0	107.380
TOP with FLOW>0	15.819	299.2	109.070
BOTTOM with FLOW=0	15.344	0.0	105.790
BOTTOM with FLOW>0	15.611	300.7	107.640

EXPECTED FLOW=0 HPT DIFF.: 0.22 psi (1.5 kPa) +/- 10%

ACTUAL FLOW=0 HPT DIFF.: 0.23 psi (1.6 kPa)

TRANSDUCER TEST PASSED



USGS SF-02a-EC (continued) – Log file from Geoprobe software



Post-Log EC Load Tests

Test	Target (mS/m)	Actual (mS/m)	% Diff	P/F
Test 1	195.0	200.3	2.7	PASS
Test 2	97.0	98.7	1.7	PASS
Test 3	24.0	24.5	2.0	PASS

***** USER NOTES *****

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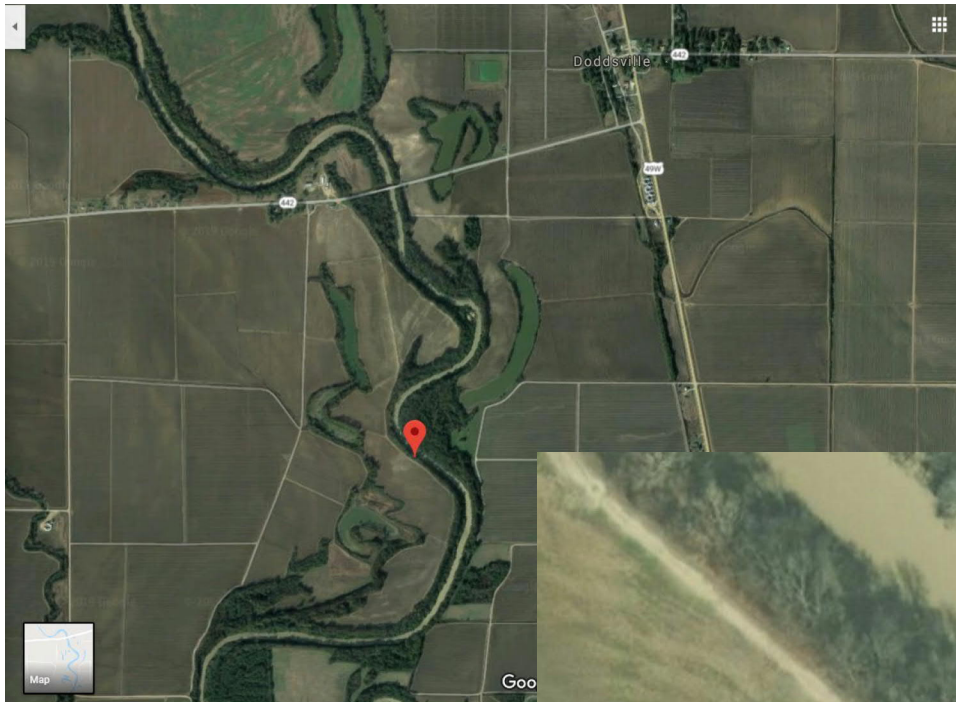
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Figure 3. Location of monitoring well SF-02a-EC near Doddsville, MS.



USGS SF-02a-EC (continued)

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MAPS New Site Sheet Form - MAPS

File Tables Search Network Help

NEW SITE

Site Record

Agency Code: USGS : U.S. Geologica Site Number: 333824090320701 Site Type Code: GW

Station Name: _____ Agency Use Code: _____

Coordinate/Altitude Data

Latitude: 333823.75 Longitude: 0903207.08 Coordinate Accuracy: H: Hndrth secon Coordinate Method: G: GPS

Coordinate Datum: NAD83: NA Datum of 1983 Latitude NAD83 in decimal degrees Longitude NAD83 in decimal degrees

Altitude in ft: 128 Altitude Datum Code: NAVD88: V Datum of 1988 Altitude Method Code: N: DEM Altitude Accuracy Value: _____

Surface Water Data

Drainage Area in sq mi: _____ Basin Code: _____

Contributing Drainage Area in sq mi: _____

Hydrologic Unit Code: 080302070506: Gorman Lake-Big Sunfl

Spatial Data

Land Net: S32 T21N R03W 0 Topographic Code: _____

Map Name: RULEVILLE, MS Map Scale: 24000

Groundwater Data

Aquifer Code: _____

National Aquifer Code: _____

Aquifer Type Code: _____

Well Depth in ft: _____

Hole Depth in ft: _____

Source of Depth: _____

Administrative Data

Country Code: US: United Stat

State Fips Code: 28: Mississippi

County Fips Code: 133: Sunflower (

Minor Civil Division: 92817: District 4

District Code: 28: MISSISSIPP

Time Zone Code: CST : Central Standar

Daylight Savings Time Flag: Y: Yes

Use Data

Primary Use of Site: _____

Secondary Use of Site: _____

Tertiary Use of Site Code: _____

Primary Use of Water Code: _____

Secondary Use of Water Code: _____

Tertiary Use of Water Code: _____

National Water Use Code: _____

Data Collection and Dates



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