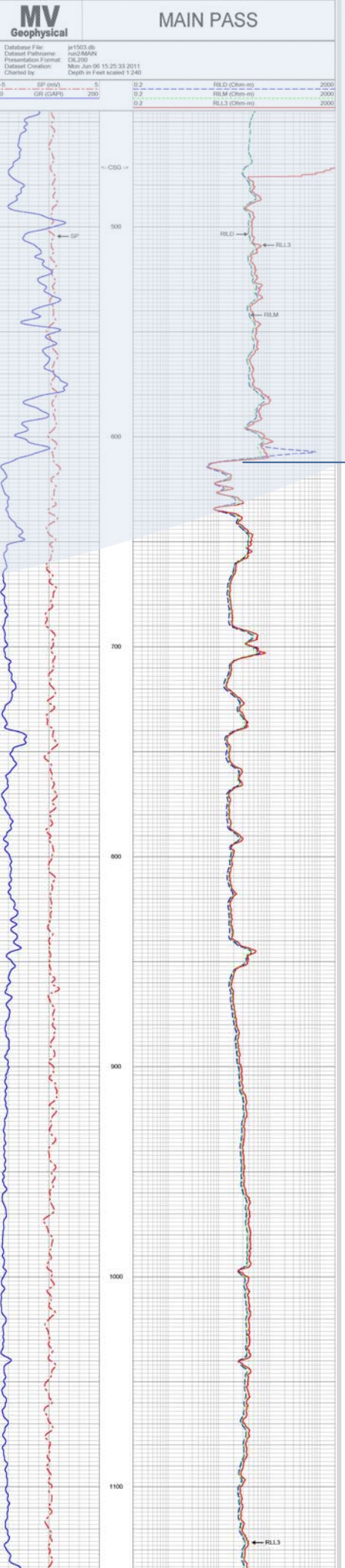

Charlotte County Utilities
Babcock Ranch Preserve
Well Completion and Testing Report

October 2011

Prepared for
Charlotte County Utilities
25550 Harbor View Road
Unit #1
Port Charlotte, FL 33980

Prepared by
Johnson Engineering, Inc.
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E B 642, G.B. 503

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BABCOCK RANCH PRESERVE
WELL COMPLETION AND TESTING REPORT

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Prepared for:

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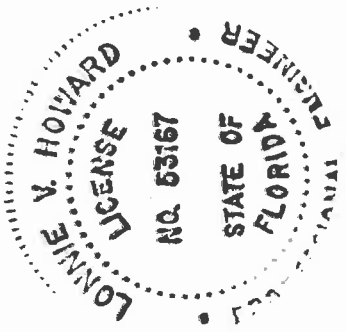

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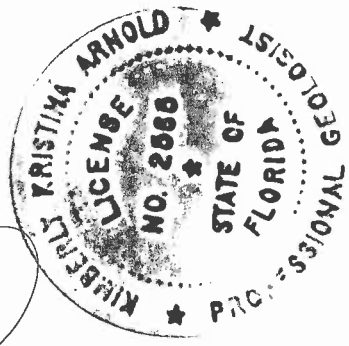

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Acronyms and Abbreviations

adl	Above data logger
APT	Aquifer performance test
bls	Below land surface
bpl	Below pad level
CCU	Charlotte County Utilities
cu ft	Cubic feet
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
ft	Feet
ft^2/d	Squared feet per day
gpd	Gallons per day
gpd/ft	Gallons per day per foot
gpm	Gallons per minute
gpm/ft	Gallons per minute per foot
HP	Horsepower
ID	Inside diameter
JEI	Johnson Engineering, Inc.
L	Leakance
MCL	Maximum contaminant level
MGD	Million gallons per day
mg/L	Milligrams per liter
ND	Not detected
NPT	National pipe thread
OD	Outside diameter
pCi/L	Picocuries per liter
ppg	Pounds per gallon
psi	Pounds per square inch
PVC	Polyvinyl chloride
PWS	Public water supply
RAI	Request for additional information
S	Storage coefficient
SDR	Standard dimension ratio
SFWMD	South Florida Water Management District
T	Transmissivity
TCUC	Town and Country Utilities
TDS	Total dissolved solids
µg/L	Micrograms per liter
µS/cm	Microsiemens per centimeter
USEPA	United States Environmental Protection Agency
WUP	Water use permit

1.0 PROJECT SUMMARY

Charlotte County Utilities (CCU) selected Johnson Engineering, Inc. to conduct an Upper Floridan aquifer drilling and testing program at a site on the Babcock Ranch Preserve in order to address questions from the South Florida Water Management District (SFWMD) related to permitting of a 3 million gallon per day (mgd) Upper Floridan aquifer wellfield for back-up supply. As part of the drilling and testing program, Johnson Engineering constructed an Upper Floridan aquifer test well 1,200 feet deep, along with monitor wells in both the Surficial and Intermediate aquifers. Water quality samples were collected during the drilling of the Upper Floridan aquifer well using the reverse air method, and specific capacity testing was performed. The well was also geophysically logged and water quality samples were collected at discrete depths using a bailer. Johnson Engineering performed a 3-day aquifer performance test (APT) on the Upper Floridan aquifer using the test well as a production well and a nearby existing agricultural irrigation well open to the Upper Floridan aquifer as an observation well during the test. Water levels in the Surficial and Intermediate aquifer wells were also monitored during the test. Upon completion of the APT, Johnson Engineering analyzed the resultant drawdown and recovery data to calculate site-specific hydraulic properties for the Upper Floridan aquifer. Finally, water samples were collected from the Upper Floridan aquifer test well and analyzed for selected water quality parameters. See **Figure 1** for well locations at the proposed CCU Babcock Ranch wellfield.

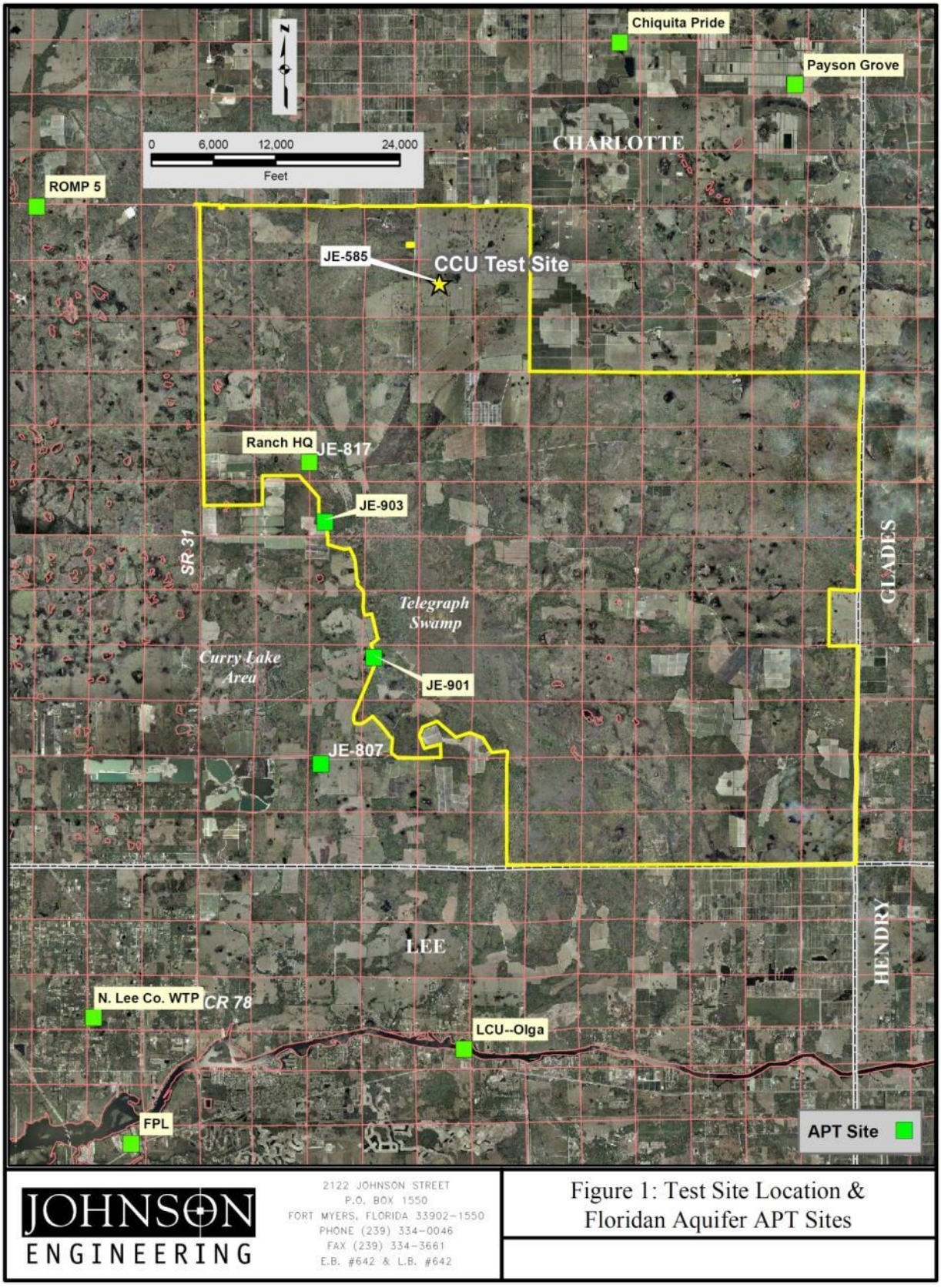


Figure 1. Aerial photograph with project site location and other test sites in the region.

2.0 INTRODUCTION

Charlotte County Utilities (CCU) submitted SFWMD water use permit application #071101-3 in November 2007, originally requesting a public water supply allocation of approximately 24.5 million gallons per day (MGD) from an Upper Floridan aquifer wellfield located on lands of the Babcock Ranch Preserve owned by the State of Florida. The application was subsequently modified over the course of the next 3 years to reduce the requested allocation to 12.5 MGD, and then to the current requested amount of 3 MGD for back-up supply. The production wells proposed for CCU's back-up supply wellfield at Babcock Ranch were originally proposed with estimated cased and total depths of 500 and 750 feet, respectively. In a series of requests for additional information (RAIs), the SFWMD expressed concerns pertaining to whether the proposed cased and total depths would result in cross-connection of the Intermediate (Lower Hawthorn) and Floridan (Suwannee) aquifer systems, as well as whether withdrawal of the proposed allocation would cause upconing of saline groundwater that could potentially impact other legal existing users or the resource. Specifically, this drilling and testing program is designed to address Question #1 of the RAI from the SFWMD dated August 4, 2010, which reads:

1. *Please complete a monitor well and then submit lithologic and water quality information at various depths at the wellfield site that demonstrate that the production horizon is from a single aquifer system, pursuant to Rule 40E-3.502(1)(FAC).*

CCU selected Johnson Engineering to prepare a drilling and testing program to address SFWMD concerns regarding aquifer/production zone depths, hydraulic connectivity, and water quality variations with depth; and then to construct the test wells, and conduct aquifer performance and water quality testing based on the testing program. The drilling and testing program prepared by Johnson Engineering replaces that prepared by Malcolm Pirnie and submitted to the SFWMD on June 26, 2008. See **Appendix A** for a copy of the SFWMD RAI this drilling and testing program was designed to address. See **Appendix B** for a copy of the Upper Floridan Aquifer Drilling and Testing Plan prepared by Johnson Engineering.

In order to acquire the site-specific information necessary to provide the SFWMD with reasonable assurances and secure issuance of the water use the permit, Johnson Engineering

prepared a hydrogeological drilling and testing program to assess the characteristics of the Upper Floridan aquifer at the project site, and submitted the program to the SFWMD permit reviewer for review and approval, as per the scope of services. At the request of the SFWMD, Johnson Engineering revised the total depth of the proposed Upper Floridan aquifer test well from 1,000 to 1,200 feet below land surface (bls). In cooperation with CCU, Johnson Engineering selected a test well location near an existing agricultural irrigation well open to the Upper Floridan aquifer on Babcock Ranch Preserve lands. Charlotte County obtained permission from the State of Florida to carry-out the drilling and testing program on State lands. The test site is located near the proposed location of the CCU Babcock Ranch wellfield.

In fulfillment of the drilling and testing program, Johnson Engineering constructed an Upper Floridan aquifer test well cased to 470 feet bls and open to 1,200 feet bls, an Intermediate aquifer monitor well with cased and total depths of 62 and 240 feet bls, respectively, and a Surficial aquifer monitor well with cased and total depths of 13 and 21 feet bls, respectively. During construction of the Upper Floridan aquifer well, Johnson Engineering collected water quality samples during drilling using the reverse air method, and had the well geophysically logged under both static and dynamic conditions. Upon completion of the wells, a 3-day constant rate APT was performed on the Upper Floridan aquifer using the Upper Floridan aquifer test well as the pumping well and the existing agricultural irrigation well as the observation well. Water levels in the Surficial and Intermediate aquifer monitor wells were recorded before, during and after the APT to assess whether appreciable hydraulic connectivity exists between the Upper Floridan aquifer and the shallower aquifer systems. Johnson Engineering analyzed the resultant drawdown and recovery data to calculate hydraulic parameters for the Upper Floridan aquifer at the CCU Babcock Ranch wellfield site.

Using the data obtained from the drilling and testing program, Johnson Engineering prepared a response to the SFWMD's RAI that addressed connectivity among the aquifer systems in the area and the potential for water quality degradation due to the proposed withdrawal. The groundwater flow model used to provide reasonable assurances regarding drawdown and impacts to existing legal users was also revised using the site-specific hydraulic parameters derived from the APT, per the advisory comment in the SFWMD RAI:

1. *Upon receipt of the monitor well data, it will be reviewed to determine if an aquifer performance test (APT) will be required. If an APT is required, the model, upconing analysis and monitoring plan submittals will need to be updated to reflect the APT results.*

3.0 WELL CONSTRUCTION

As part of the scope of services, Johnson Engineering agreed to construct one (1) 4-inch by 50-foot deep Surficial aquifer monitor well, one (1) 4-inch by 250-foot deep Intermediate aquifer monitor well, and one (1) 6-inch by 1,000 foot deep Floridan aquifer monitor well. Actual well construction details were modified slightly to correspond to the lithologies encountered in the field and to accommodate SFWMD-requested revisions to the drilling and testing program prepared by Johnson Engineering. See **Appendix C** for SFWMD well construction permits.

Johnson Engineering used equipment leased from Five Stones Well Drilling, LaBelle Well Drilling and Hertz, including a drill rig, mud system and other drilling equipment. Licensed water well contractors on-staff at Johnson Engineering performed all well construction.

On April 12, 2011, the Florida Department of Environmental Protection (FDEP) granted permission to Charlotte County to access State lands to conduct the drilling and testing program. See **Appendix D** for a copy of the letter of consent from the FDEP. The consent granted by the FDEP was to remain in effect from the date of execution of the letter, as executed by Charlotte County on April 13, 2011, until December 30, 2011.

See **Figure 2** for locations of completed test wells.

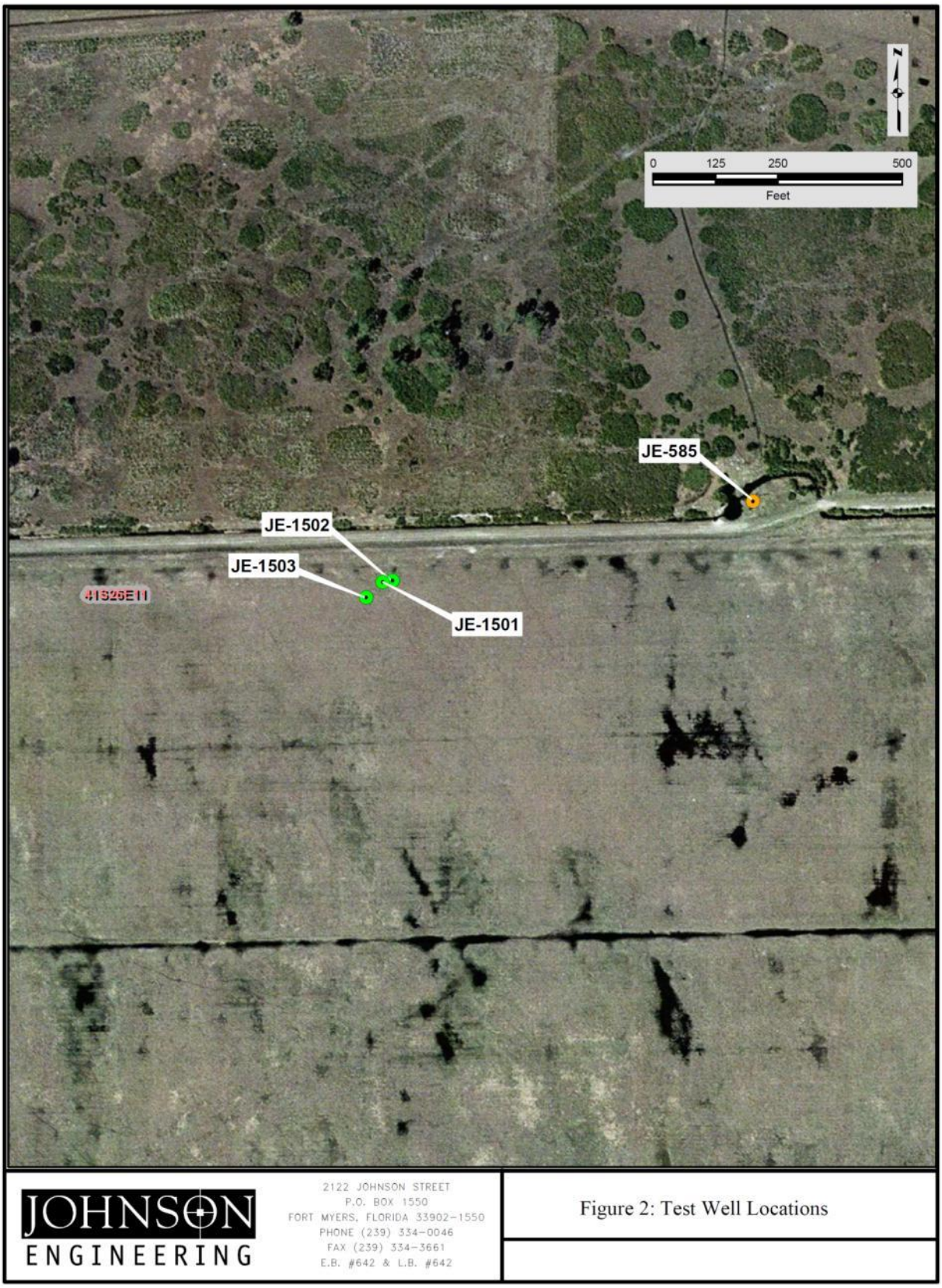


Figure 2. Test and monitor well location map.

JE-585

Prior to beginning test well construction, Johnson Engineering performed a videolog of an existing agricultural irrigation well open to the Upper Floridan aquifer and located near the proposed test site. This well, JE-585, is included on SFWMD water use permit #08-00132-W for agricultural irrigation for the Babcock Ranch Preserve. JE-585 has a 12-inch diameter steel casing that extends to a depth of approximately 270 feet from top of casing (TOC) and a total depth of 551 feet from TOC. On April 15, 2011, Johnson Engineering staff measured a static water level of 8.1 feet below TOC and a specific capacity of approximately 30 gallons per minute per foot (gpm/ft) for the well. Johnson Engineering also collected a water quality sample from JE-585 and performed an in-house chloride titration. The sample reported a specific conductance of 1,548 microsiemens per centimeter (µS/cm) and a chloride concentration of 254 milligrams per liter (mg/L).

Intermediate Aquifer Monitor Well JE-1501

Construction of the Intermediate aquifer monitor well, JE-1501, began on April 28, 2011. A 5-inch diameter pilot hole was drilled to 240 feet bls in order to determine the cased and total depths of the well. During construction of all monitor wells, well cuttings were collected and described at 10-foot intervals or at major changes in lithology. Drilling was conducted using the mud rotary method except where explicitly noted. The pilot hole was reamed to 8 inches to a depth of 62 feet bls, and 4-inch schedule 40 PVC well casing was installed to that depth and grouted using 10 94-pound sacks of Portland Type I/II neat cement. The well was cleaned out to 240 feet bls using a 3-7/8-inch roller cone bit and air-lift developed. The well had a low yield of approximately 5 gpm.

Surficial Aquifer Monitor Well JE-1502

Construction of Surficial aquifer monitor well JE-1502 started on May 3, 2011. Johnson Engineering drilled a 7-7/8-inch borehole to 21 feet bls and set 13 feet of 4-inch schedule 40 PVC well casing with 8 feet of 4-inch schedule 40 PVC 0.032-slot well screen. Ten sacks of 6/20 silica sand were emplaced around the screen to a depth of 4.5 feet bls and topped off with 1 sack of cement. The well was air-lift developed.

Upper Floridan Aquifer Monitor Well JE-1503

Johnson Engineering began construction of Upper Floridan aquifer monitor well JE-1503 on May 4, 2011. Using a 14-3/4-inch bit, a borehole was drilled to 61 feet bls and 10-inch diameter schedule 40 PVC surface casing was set to that depth. The surface casing was grouted using 32 sacks of neat cement. After setting surface casing, a 5-1/4-inch diameter pilot hole was advanced to 618 feet bls. No significant production zone was encountered during drilling of the pilot hole. Based on the lithology observed during drilling of the pilot hole, Johnson Engineering reamed the borehole to 470 feet bls using a 9-5/8-inch bit and conditioned the hole with bentonite in preparation for geophysical logging. On May 16, 2011, MV Geophysical logged the borehole for dual induction, natural gamma and caliper to a depth of 467 feet bls.

On May 17, 2011, Johnson Engineering ran 6-inch diameter schedule 40 PVC well casing to a depth of 470 feet bls and pressure grouted the first lift using 40 sacks of cement with 5% high yield drilling mud chased with 50 gallons of water. Cement from the first lift was tagged at 255 feet bls in the annulus the following day. The casing was then pressurized to 60 psi, and a second lift consisting of 52 sacks of cement with 5% high yield drilling mud was brought to land surface using the tremmie method. Johnson Engineering tagged cement inside the casing at 463 feet bls on May19, 2011 and proceeded to advance the borehole to 860 feet bls using the mud rotary drilling method, as necessitated by the presence of sand in the borehole.

Beginning the week of May 23, 2011, Johnson Engineering air-lift developed the interval from 470 to 830 feet bls at a rate of approximately 600 gpm and switched over to the reverse air drilling method. The borehole was then advanced to 1,200 feet bls using reverse air. While drilling using the reverse air method, water quality samples were collected at 20-foot intervals and analyzed for specific conductance and total dissolved chloride by Johnson Engineering staff. At 60-foot intervals, specific capacity tests were performed, and water quality samples were collected at the end of each test. The samples were submitted to Benchmark EnviroAnalytical, Inc. lab to be analyzed for specific conductance, total dissolved solids (TDS), total dissolved chloride, sulfate, sodium and hardness. Water quality and specific capacity samples collected using this method yielded inconclusive results, since, as additional geophysical logging would later show, all major production zones occur above 860 feet bls. When the borehole had been

advanced to the final depth of 1,200 feet bls, a final specific capacity test was conducted. The test reported a value of 29 gpm/ft for the entire open interval.

MV Geophysical returned to log the completed well on June 6, 2011. Prior to logging, the well had been shut in since June 1. Under initial static conditions, MV Geophysical ran fluid resistivity, natural gamma, and temperature logs. Grab samples were then collected using a bailer at 520, 620, 800, 1,000, and 1,180 feet bls under static conditions. Finally, caliper and flow logs were run. A set of logs was also run under dynamic conditions, pumping the well at approximately 160 gpm. These logs included temperature, flow and fluid resistivity.

Following the completion of all test wells, Johnson Engineering conducted a 3-day aquifer performance test on the Upper Floridan aquifer using JE-1503 as the pumping well and monitoring water levels in JE-585, JE-1501 and JE-1502. The pumping portion of the test ran from June 13 to 16, followed by 6 days of recovery. The APT pumped JE-1503 at a rate of approximately 125 gpm. Samples for a suite of water quality parameters were collected from JE-1503 on August 13, 2011.

See **Table 1** for a summary of well construction details.

Well	Cased Depth (ft bls)	Total Depth (ft bls)	Surface Casing Depth (ft bls)	Open/Screened Interval (ft bls)
JE-585	270	551	N/A	270-551
JE-1501	62	240	N/A	497-620
JE-1502	13	21	N/A	13-21
JE-1503	470	1,200	0-61	470-1,200

Table 1. Test well construction details.

See **Appendix E** for well construction details and photographs.

4.0 HYDROGEOLOGY

Well cuttings were collected at ten-foot intervals or at major changes in lithology during the drilling of all three test wells. The cuttings were collected prior to passing through the mud system. Johnson Engineering described the collected well cuttings and compiled the following lithologic description based on the results.

The lithology at the Charlotte County Utilities Babcock Ranch wellfield site consists of approximately 30 feet of surficial sands and layers of large shell and shell fragments. A shell bed underlies the surficial sands from approximately 13 to 30 feet bls. Some silt stone may occur below 20 feet bls. These shell and sand layers comprise the Surficial aquifer, which displays high yield at the project site, with most yield coming from the deeper shell bed. Many of the agricultural irrigation wells at the Ranch are constructed in the Surficial aquifer due to the good productivity and fresh water quality of this zone.

The confining layer between the Surficial and Intermediate Aquifer Systems consists of clays of moderate stiffness and plasticity beginning around 30 feet bls and extending to 60 feet bls at the test site. This silty clay contains some shell and fine-grained limestone fragments, which decrease below 50 feet bls. A phosphatic limestone is present below the confining layer and comprises the Intermediate Aquifer System. The thin layer of fine-grained limestone only extends from approximately 60 to 65 feet bls at the test site. Although observation of cuttings indicated good porosity due to the presence of shell, test well JE-1501 open to this layer does not produce significant amounts of water, as determined by specific capacity testing. A silty clay with some shell from 65 to 70 feet bls occurs beneath the limestone layer, followed by silt with clay and trace amounts of limestone and shell. A sequence of clays and silts containing some to trace amounts of limestone and shell extends from approximately 65 feet bls to 460 feet bls. The color ranges from white to dark grayish-brown, and phosphate is present. These clays and silts form the confining layer between the Intermediate Aquifer System and the Floridan aquifer.

The top of the Lower Hawthorn producing zone of the Upper Floridan aquifer begins at approximately 460 feet bls and consists of a weathered limestone that contains appreciable amounts of clay near the top, as well as trace phosphate and shell. Moldic porosity is observed in the cuttings. A clay layer occurs beneath the limestone at approximately 490 feet bls, followed by an interval of alternating silts and clays from 500 to 610 feet bls. These layers contain

phosphate and trace to appreciable amounts of fine-grained white limestone with shell that is poorly to moderately indurated. A second distinct sandy limestone layer occurs from 610 to 620 feet bls, followed by sand with clay and interbedded limestone layers from 620 to 650 feet bls, and a sandy limestone to sandstone layer at 650 to 660 feet bls. The interval from approximately 610 to 660 feet bls produces large amounts of sand. A fine grained limestone layer approximately 10 feet thick is present from 660 feet bls, and underlain by a layer of clay with silt from 670 to 690 feet bls.

The main part of the Suwannee limestone begins at approximately 690 feet bls and consists of fine-grained, poorly to moderately indurated limestone with varying amounts of shell and fines. Portions of the limestone display secondary and moldic porosity based on examination of the cuttings, although these observed characteristics of the rock may not necessarily correspond to a production zone, as determined from geophysical logging. From 980 to 1,100 feet bls, the limestone is finely laminated and breaks into plates resembling shell at times. The limestone may be in the process of transitioning to dolomite, although it does not appear to have fully reached this stage. Occasional clay layers occur throughout this interval, such as from 780 to 790 feet bls and 1,045 to 1,050 feet bls. Below 1,100 feet bls, the limestone has a chalkier texture with minor amounts of shell and fines. In the interval from 1,150 to 1,180 feet bls, small visible crystals of calcite appear. Beginning around this depth and extending to approximately 1,185 feet bls, layers of a lime mud matrix with embedded shell, limestone and sand occurs within the dominantly limestone lithology. Presence of the silty, fine-grained limestone continues until termination of the borehole at 1,200 feet bls. Visible calcite crystals also occur within the interval from 1,185 to 1,190, and trace amounts of a phosphatic sandstone appear from 1,190 to 1,200 feet bls.

See **Appendix F** for lithologic logs for test well JE-1503.

5.0 GEOPHYSICAL LOGGING

Johnson Engineering contracted with MV Geophysical Survey to log Upper Floridan aquifer test well JE-1503 both during and after construction. The logs were designed to assess the physical properties of the aquifer and subsurface lithology at the project site. Dual induction, X-Y caliper and natural gamma logs were run on the reamed borehole prior to setting casing. A complete suite of geophysical logs was also run following the completion of the well. Geophysical logging included X-Y caliper, natural gamma, dual induction, high resolution temperature, fluid conductivity and flow under both static and dynamic conditions, although not all logs were run in every instance. Logging generally included two passes through the borehole, which consisted of the main pass, when the logging tool was initially lowered, and a repeat section as the tool was returned to land surface. Results, often used in conjunction with lithologic and water quality data, and interpretations of note are as follows.

The X-Y caliper log performed on the completed well clearly shows the washout zones associated with the interbedded limestones and sands from approximately 615 to 650 feet bls. The natural gamma signal also drops off immediately above this interval, indicating the termination of the clastic portion of the phosphate-rich Arcadia Formation. Above this depth within the Arcadia Formation, decreases in the natural gamma signal correspond to limestone layers encountered from 460 to 490 feet bls and from approximately 290 to 330 feet bls, as noted in the driller's log, although the cuttings from these depths appear as dominantly clay.

The flow logs show flow zones at approximately 514-520, 655-670, 690-710, 755-772, 788-800 and 845-855 feet bls. No flow occurs below approximately 855 feet bls, according to the logs. The uppermost major flow zone appears to exist around 650 feet bls, although interpretation of this part of the log can be complicated by the presence of the wash-outs from approximately 615 to 650 feet bls. Flow data were also collected at seven stations centered at 450, 510, 590, 650, 750, 840 and 900 feet bls. As expected, flow increased up-borehole, from 0 to over 48 counts per second (cps) between 900 and 450 feet bls, which equates to fluid velocities of 0 to 18 feet per minute. A calibration run using a known line speed was performed inside the casing under static conditions in order to determine that 1 cps was equal to approximately 0.39 ft/min.

The dynamic fluid conductivity logs shows conductivity of the fluid in the borehole remaining stable down to approximately 650 feet bls, then gradually increasing until approximately 860 feet bls, after which point it decreases to the bottom of the borehole. The static fluid conductivity log shows an increase in conductivity from 400 feet (inside the casing) until approximately 610 feet bls. It then levels off until 800 feet bls, after which point it decreases until the bottom of the borehole. Water quality samples collected from discrete depths using a bailer show a similar overall water quality trend. Samples were collected at 520, 620, 800, 1,000, and 1,200 feet bls and analyzed for chloride, total dissolved solids and specific conductance. The analysis results also show all parameters increasing with depth until approximately 800 feet bls and then becoming fresher with depth.

Induction logs measure the electrical conductivity of the surrounding formation, whereas the fluid conductivity logs measure the conductivity of the fluid in the borehole. Effective porosity may also influence the resistivity readings from the dual induction logs. The induction logs show a decrease is resistivity from approximately 610 to 650 feet bls, corresponding with the wash-out zone. This drop may be attributable to the higher effective porosity due to the voids at this interval, rather than a degradation of water quality. Smaller decreases in resistivity also occur from approximately 660-690, 705-720, 740-760, 765-790 and 795-840 feet bls. Resistivity increases slightly with depth in the borehole until approximately 1,100 to 1,150 feet bls, where it gradually dips again before increasing near the bottom of the borehole. Fluid conductivity logs also show a freshening of water quality with depth below approximately 800 feet bls.

See **Appendix G** for copies of the geophysical logs.

6.0 TESTING DURING DRILLING

During drilling using the reverse air method, Johnson Engineering collected water quality samples at 20-foot intervals and analyzed them for specific conductance and total dissolved chloride. Specific capacity tests were also performed at 20-foot intervals coincident with the water quality samples. At 40-foot intervals, water quality samples were collected at the end of every other specific capacity test and analyzed for specific conductance, total dissolved solids (TDS), total dissolved chloride, sulfate, sodium and hardness by a certified analytical laboratory. The air line for the drill rig was used to stress the well for testing conducted during drilling, and flow was measured using a barrel orifice with known dimensions. The barrel orifice consisted of a barrel with four 1-inch diameter holes, the lowest part of each of which was 0.12 feet off the bottom of the barrel. An orifice flow equation was then used to calculate flow with depth from the bottom of the barrel.

Johnson Engineering measured the flow rate from the well using the barrel orifice and measured specific conductance in the field using a calibrated meter. Water quality samples were collected in pre-labeled sample bottles provided by Benchmark EnviroAnalytical lab for analysis of chloride and TDS concentration and specific conductance for the depths of 820, 860, 900, 940, 980, 1,020, 1,060, 1,100, 1,140, 1,180, and 1,200 feet bls.

The testing was performed at the following depths:

JE-1503 Tests					
Depth	***Date***	***Specific Conductance (mS/cm)***	***Static Water Level (feet BTOC)***	***Pumping Water Level (feet BTOC)***	***Pump Rate (gpm)***
620	5/23/11	2.25	8.88	10.8	50
840	5/23/11	2.23	8.88	12.05	50
780	5/25/11	2.25	9.20	12.30	50
800	5/25/11	2.50	9.20	11.32	50
820	5/25/11	2.55	9.20	11.85	50
840	5/25/11	2.18	9.20	11.75	50
860	5/25/11	2.57	9.20	11.40	50
880	5/25/11	2.61	9.20	11.15	50
900	5/25/11	2.75	9.20	11.60	50
920	5/25/11	2.57	9.20	11.37	50
940	5/25/11	2.69	9.20	10.88	50
960	5/25/11	2.70	9.20	10.95	50
980	5/27/11	2.54	9.25	10.90	48
1,000	5/27/11	2.41	9.25	11.02	48
1,020	5/27/11	2.25	9.25	10.94	48
1,040	5/27/11	2.41	9.25	10.62	48
1,060	5/27/11	2.59	9.25	10.70	48
1,080	5/27/11	2.46	9.25	10.62	48
1,100	5/27/11	2.39	9.25	10.67	48
1,100	5/31/11	2.75	8.95	10.15	48
1,120	5/31/11	2.51	8.95	10.24	48

Depth	*Date*	*Specific Conductance (mS/cm)*	*Static Water Level (feet BTOC)*	*Pumping Water Level (feet BTOC)*	*Pump Rate (gpm)*
1,140	5/31/11	2.48	8.95	10.18	48
1,160	5/31/11	2.49	8.95	10.30	48
1,180	5/31/11	2.46	8.95	10.30	48
1,200	5/31/11		8.95	10.09	47
1,200	6/1/11		8.88	11.36	94*
1,200	6/1/11		8.88	14.05	160*
1,200	6/1/11		8.88	14.35	160*
1,200	6/6/11		8.94	14.40	160*

*Well stressed using a pump

Table 2. JE-1503 results of testing during drilling.

Johnson Engineering could not begin advancing the borehole using the reverse air method until approximately 860 feet bls due to the presence of sand primarily originating from the interval from 615 to 660 feet bls. Samples listed for depths above 860 feet bls, therefore, may not be representative of that discrete depth. By the time the reverse air method could be employed, all of the major production zones had been intersected previously using mud rotary drilling. As a result, the specific capacity and specific conductance data collected do not show any clear trends with depth, since the tested interval from 860 to 1,200 feet bls does not contribute appreciable flow to the well. Specific capacity testing performed on the well at the end of construction reports a value of 29 gpm/ft. The specific capacity of the well provides an estimate of transmissivity for the formation of 58,000 gallons per day per foot (gpd/ft), or 7,750 feet squared per day (ft^2/d; Driscoll, 2003). This value generally agrees with others reported for the Upper Floridan aquifer in this area.

7.0 FLORIDAN AQUIFER PERFORMANCE TESTING AND DRAWDOWN MODELING

At the completion of test well construction, Johnson Engineering performed a three-day constant pumping rate aquifer performance test and subsequent recovery test on the Upper Floridan aquifer at the test site. The APT used test well JE-1503 as the pumping well and monitored water levels in JE-585, used as an observation well representative of the Upper Floridan aquifer. JE-585 is located approximately 802 feet east of JE-1503 and has cased and total depths of 270 and 551 feet bls, respectively. Water levels in Intermediate aquifer monitor well JE-1501 and Surficial aquifer monitor well JE-1502 were also monitored in order to determine whether appreciable hydraulic connectivity exists between these shallower aquifers and the Upper Floridan aquifer production zone. See **Figure 2** for well locations.

Prior to beginning the pumping portion of the test, background water levels from JE-1503 and all 3 monitoring wells (JE-585, JE-1501 and JE-1502) were collected for 6 days. Immediately prior to beginning the pumping portion of the APT, the datalogger data collection interval for the instruments in the Upper Floridan aquifer test/monitor well and JE-585 was re-set to record data every second and then increased in graduated steps to 3-minute intervals for the duration of the pumping portion of the APT. The APT ran from June 13 to June 16, 2011 using test well JE-1503 as the pumping well and JE-585 as the observation well. The pumping portion of the APT ran for a total of 4,321 minutes and had an average pumping rate of 125 gpm. Immediately prior to ending the pumping portion of the APT, the datalogger data collection interval for the instruments in the Upper Floridan aquifer test/monitor well and J-585 was again re-set to record data every second and then increased in graduated steps to 3-minute intervals for the duration of the recovery portion of the APT. The dataloggers/pressure transducers remained in the wells for approximately 6 days after turning off the pump to collect recovery water level data. The temporary pump used for the APT also remained in JE-1503 during the recovery period. Water levels in JE-1503 and JE-585 returned to or near background levels within approximately 30 hours of turning off the pump. Water levels in Surficial aquifer monitor well JE-1502 rose during the test due to disposal of water pumped from JE-1503 into a nearby ditch creating a mounding of the water table. Hydrographs from wells JE-1501, JE-1502, JE-1503 and JE-585 have been provided as **Figures 3**.

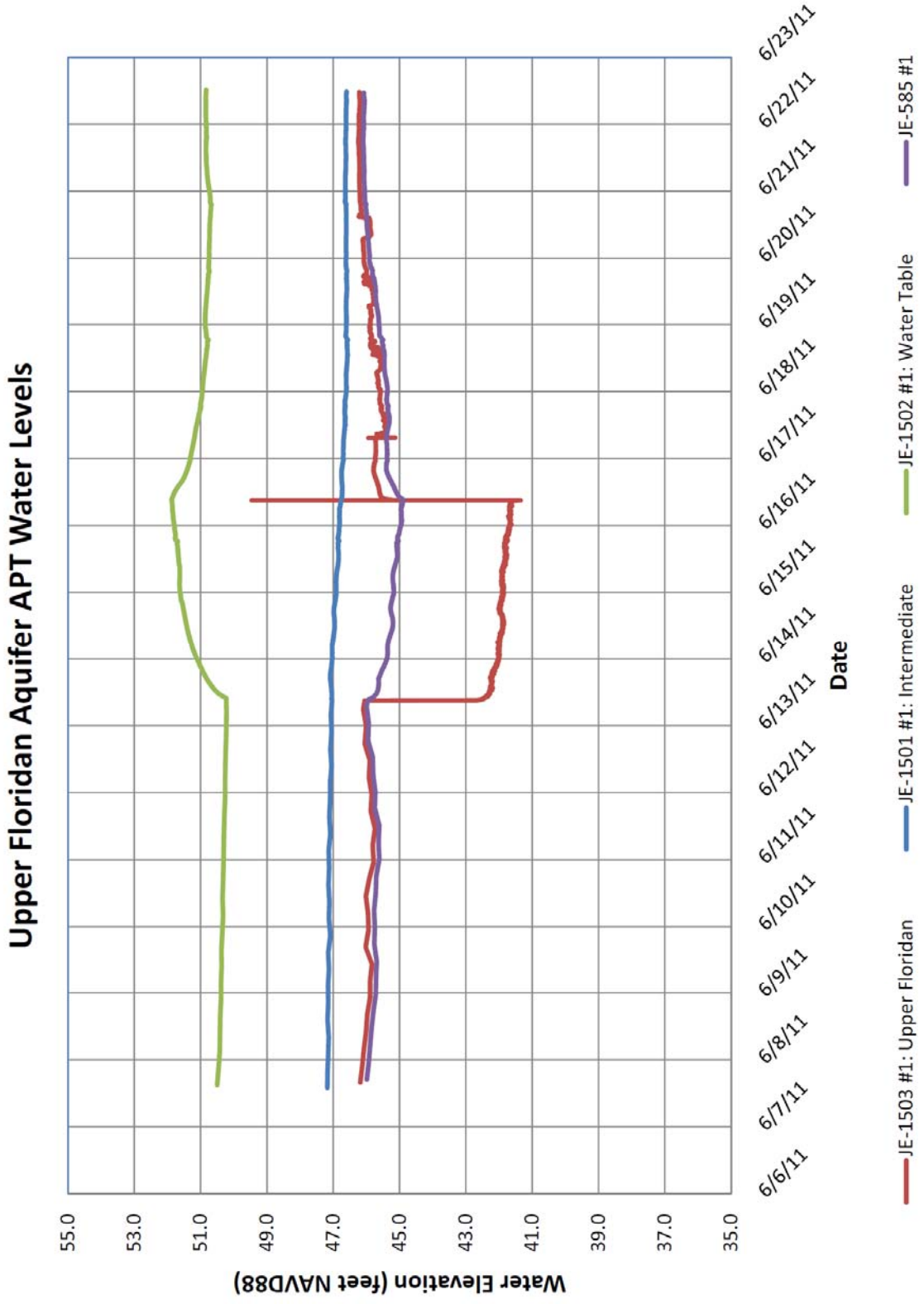


Figure 3. Hydrograph of water levels during APT.

Water levels recorded in JE-585 exhibited a background declination of approximately 0.5 feet during the APT. In order to account for this background trend unrelated to the test, drawdown was calculated relative to a linear interpolation between pre-APT and post- recovery water levels so as not to over-estimated drawdown in JE-585 created by pumping JE-1503. See **Figure 4** for a plot of JE-585 water levels and the trend line used to calculate drawdown.

Drawdown data from JE-585 were analyzed using a Hantush and Jacob (1955) leaky aquifer solution and a manual fit of the data. Data used in the curve matching analysis were unsampled. The data analysis produced a transmissivity value of 11,440 feet squared per day, a storage coefficient value of $1.1e^{-3}$, and a leakance value of $7.1e^{-4}$ per day. See **Figure 5** for drawdown data curve matching and analysis. Analysis of recovery data from JE-1503 using the Theis (1946) recovery solution produced a similar transmissivity value of 12,560 feet squared per day. See **Figure 6** for recovery data analysis. These values also agree well with those measured at the Town and Country Utilities (TCUC; SFWMD #08-00122-W) APT site. Testing at the TCUC wellfield, approximately 4 miles to the south of the Charlotte County Utilities site, reported a transmissivity value of 10,800 feet squared per day, a storage coefficient value of $1.56e^{-4}$, and a leakance value of $2.1e^{-4}$ per day.

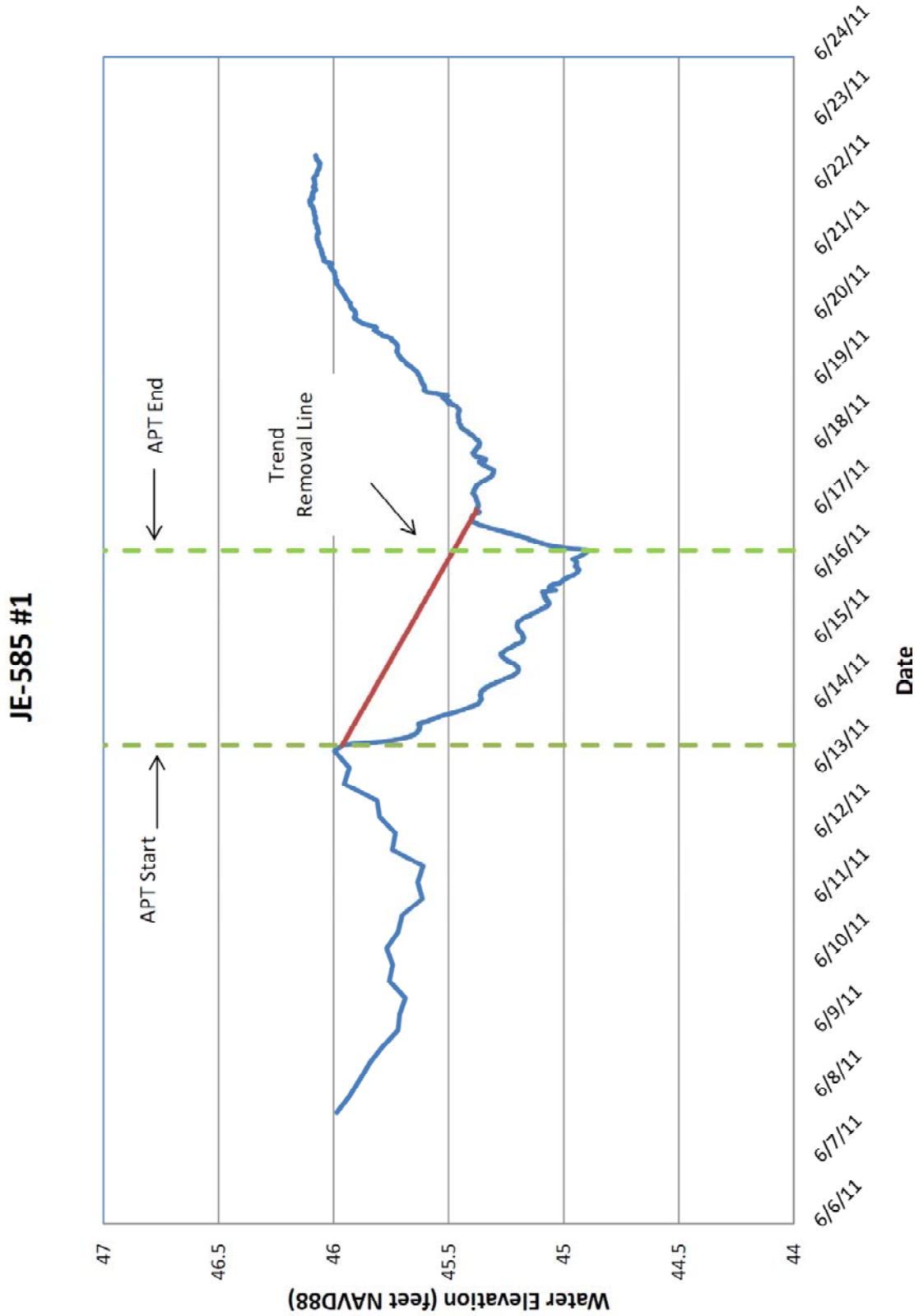


Figure 4. JE-585 water level during APT.

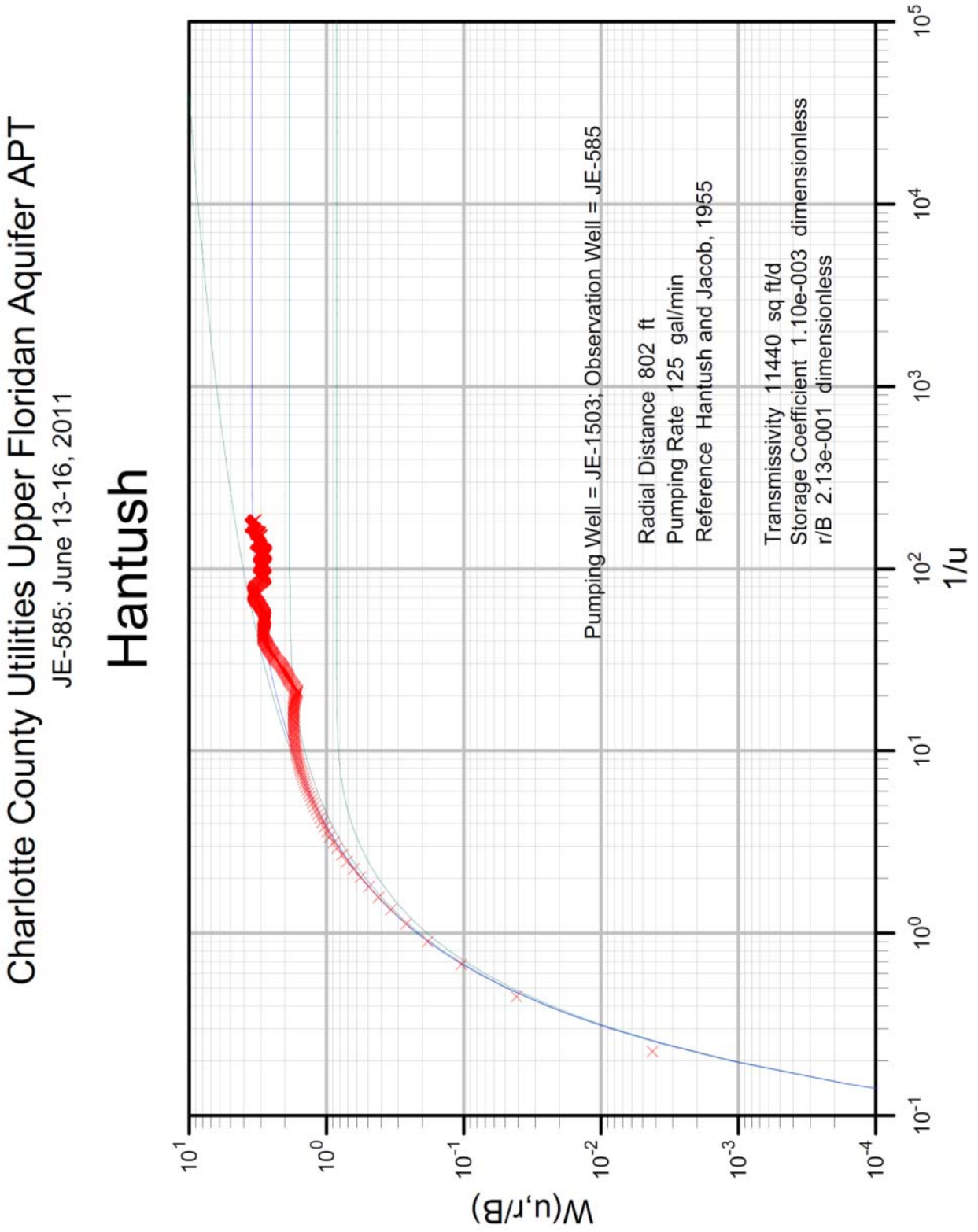


Figure 5. JE-585 APT drawdown data analysis.

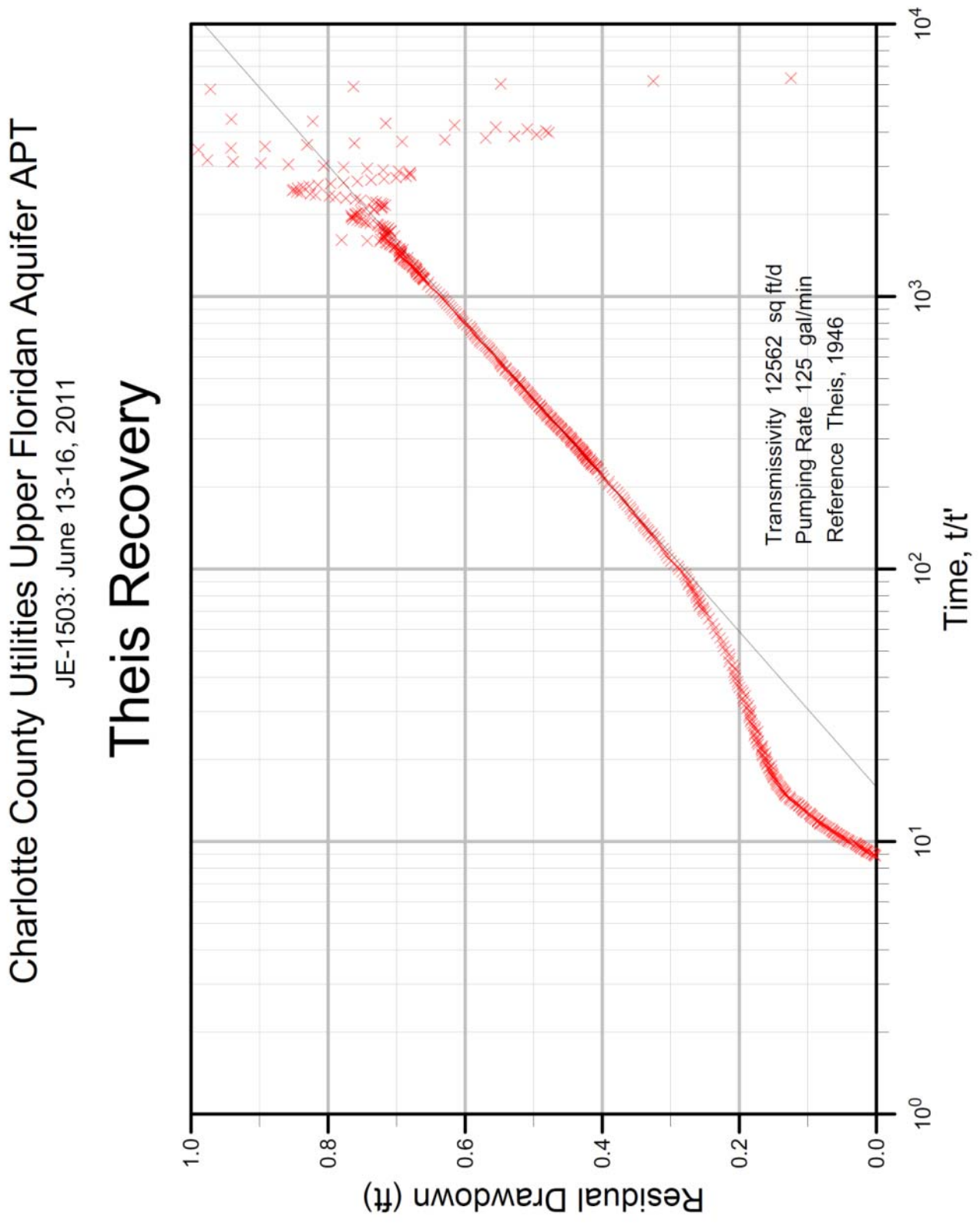


Figure 6. JE-1503 APT recovery data analysis.

Several other APTs conducted on the Upper Floridan aquifer within 5 to 20 miles of the project site report transmissivity values consistent with that measured at the CCU Babcock Ranch wellfield test site. The storage and leakance values calculated at the test site also fall within the ranges reported for those aquifer parameters from other APTs in the area. See **Figure 7** for Floridan aquifer parameters derived from other APTs conducted in the area.

In response to an advisory comment from the SFWMD included on the August 4, 2010 RAI for the CCU SFWMD water use permit application, Johnson Engineering revised the groundwater modeling of the requested Upper Floridan aquifer withdrawals using hydraulic parameters calculated from the results of the APT. A single layer WINFLOW (version 3.05) model using a Hantush and Jacob (1955) Leaky Aquifer solution was developed to depict the CCU public supply wellfield. In accordance with the SFWMD Basis of Review, the model simulated withdrawals of 3.0 mgd from 3 production wells (1.0 mgd per well) for a period of 90 days without rainfall recharge. The model predicts up to 9 feet of drawdown near the center of the CCU wellfield. See **Figure 8** for a map of predicted drawdown in the Upper Floridan aquifer.

Based on results from the revised modeling, the 1-foot drawdown contour created by withdrawing the requested allocation from the Charlotte County Utilities wellfield may intersect Lower Hawthorn/Upper Floridan aquifer uses at the East Charlotte Drainage District (#2689) and Lady Moon Farms (#9648) within the Southwest Florida Water Management District (SWFWMD). The SWFWMD identifies the source for the East Charlotte Drainage District and Lady Moon Farms as from the Intermediate Aquifer System. However, these permitted users were included in the cumulative impact model because the listed well construction details are similar to those of JE-585, which shows hydraulic connectivity with Upper Floridan test well JE-1503.

Additionally, six Babcock Ranch Lower Hawthorn/Upper Floridan aquifer wells (SFWMD #08-00132-W) were also included in the cumulative impact model. These wells include: A5-2 (JE-584), B6-1 (JE-588), B6-4 (JE-704), C4-2 (JE-614), D3-1 (JE-618) and D4-2 (JE-613). Most of these wells are listed as secondary or standby facilities and do not have rated capacities. All wells, with the exception of D3-1, were simulated using a conservative pumping rate of 1 mgd each. The model simulated withdrawals of 72,000 gpd from D3-1 due to the small diameter and low measured yield of that well.

Withdrawals by the Town and Country Utilities public supply wellfield (SFWMD #08-00122-W) were also included in the model as a large nearby user in the Upper Floridan aquifer, although the 1-foot drawdown contours of the two projects do not intersect. Please refer to **Table 3** for permitted users included in the cumulative impact model, along with their number of wells and withdrawal rates. The model simulated withdrawal rates for the facilities permitted through the SWFWMD based on the peak day allocations assigned for each facility, as obtained from the SWFWMD web site.

The cumulative impact model results indicate that up to 20 feet of drawdown may occur at some of the East Charlotte Drainage District wells (**Figure 9**), and approximately 12 feet may occur at the CCU production wells. Based on the lowest recorded water level of 45.8 feet, NGVD measured at ROMP 5 (Suwannee) and a top of aquifer depth of -396 feet, NGVD (450 feet bls), 421.8 feet of potentiometric head will remain above the top of the aquifer based on the greatest predicted drawdown.

On August 24, 2011, Johnson engineering submitted a response to the SFWMD RAI based on the results of the drilling and testing program, including a discussion of the lithology and water quality encountered during drilling and the geophysical logging results. APT data analyses and determination of hydraulic parameters for the Upper Floridan aquifer at the CCU test site were also provided to the SFWMD, along with revised drawdown modeling, per the advisory comment in the SFWMD's August 2010 letter. See **Appendix H** for a copy of the RAI response.

Permit #	Project Name	Max Month Allocation (mgm)	Source
SFWMD			
08-00122-W	Town and Country Utilities	205.1	Upper Floridan aquifer (17 wells)
08-00132-W	Babcock Ranch Preserve	152.28	Lower Hawthorn aquifer/FAS (6 wells)
SWFWMD			
2689	East Charlotte Drainage District	397.92	Intermediate (per SWFWMD; 17 wells varying rates)
9648	Lady Moon Farms	51.67	Intermediate (per SWFWMD; 6 wells)

Table 3. Permitted users included in cumulative impact model

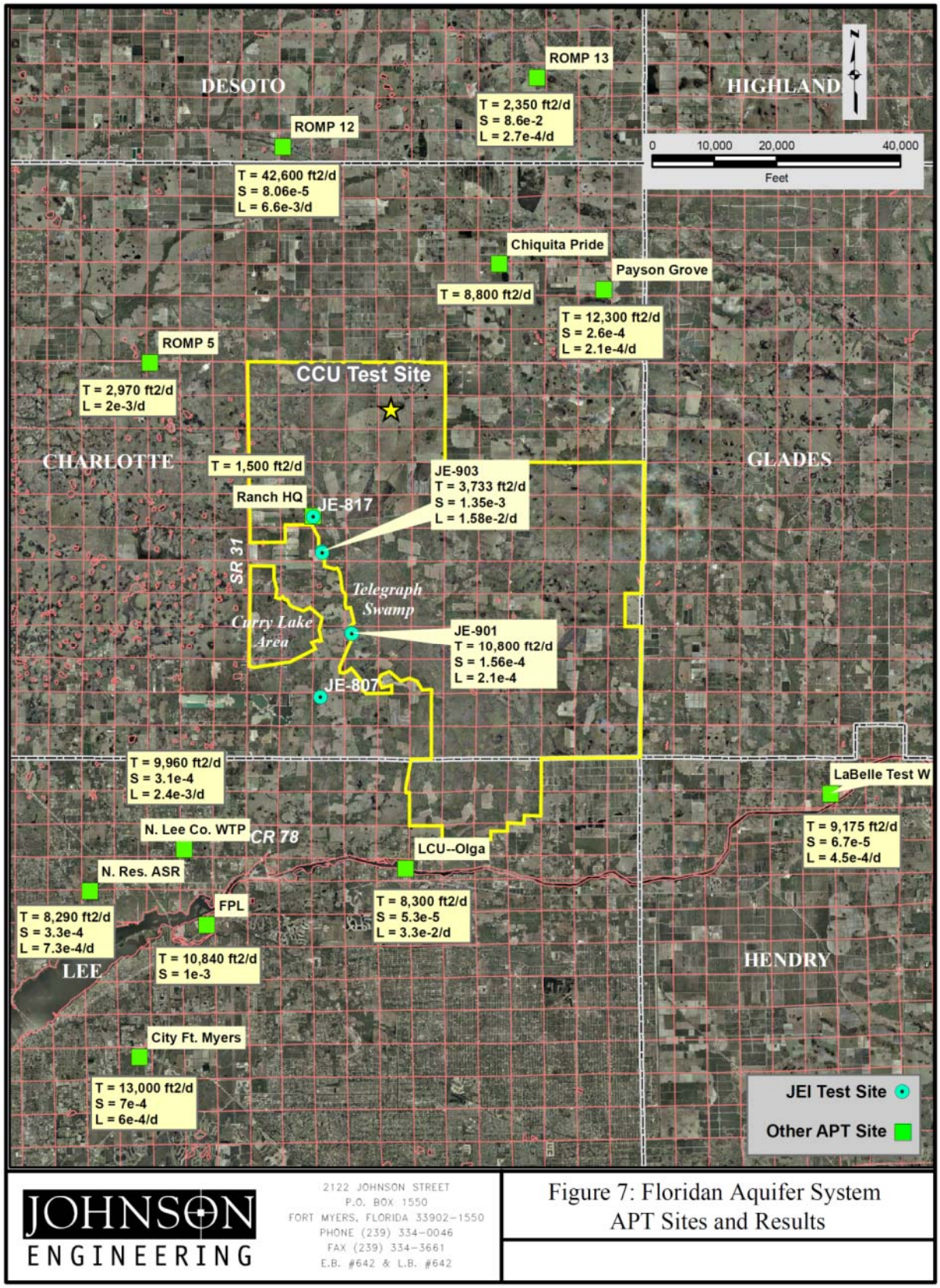


Figure 7. Floridan aquifer hydraulic parameters.

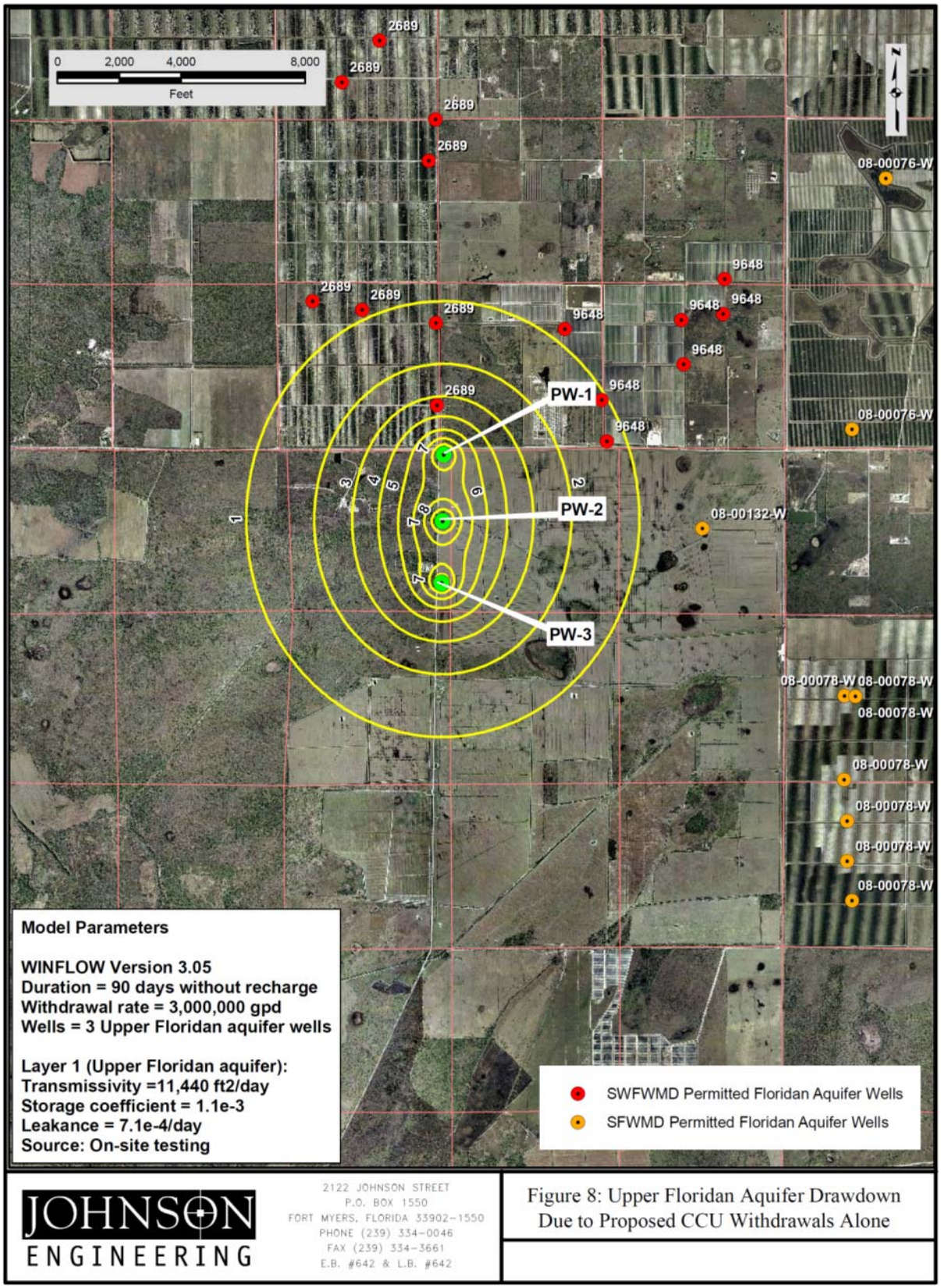


Figure 8. Predicted Floridan aquifer drawdown due to CCU withdrawals.

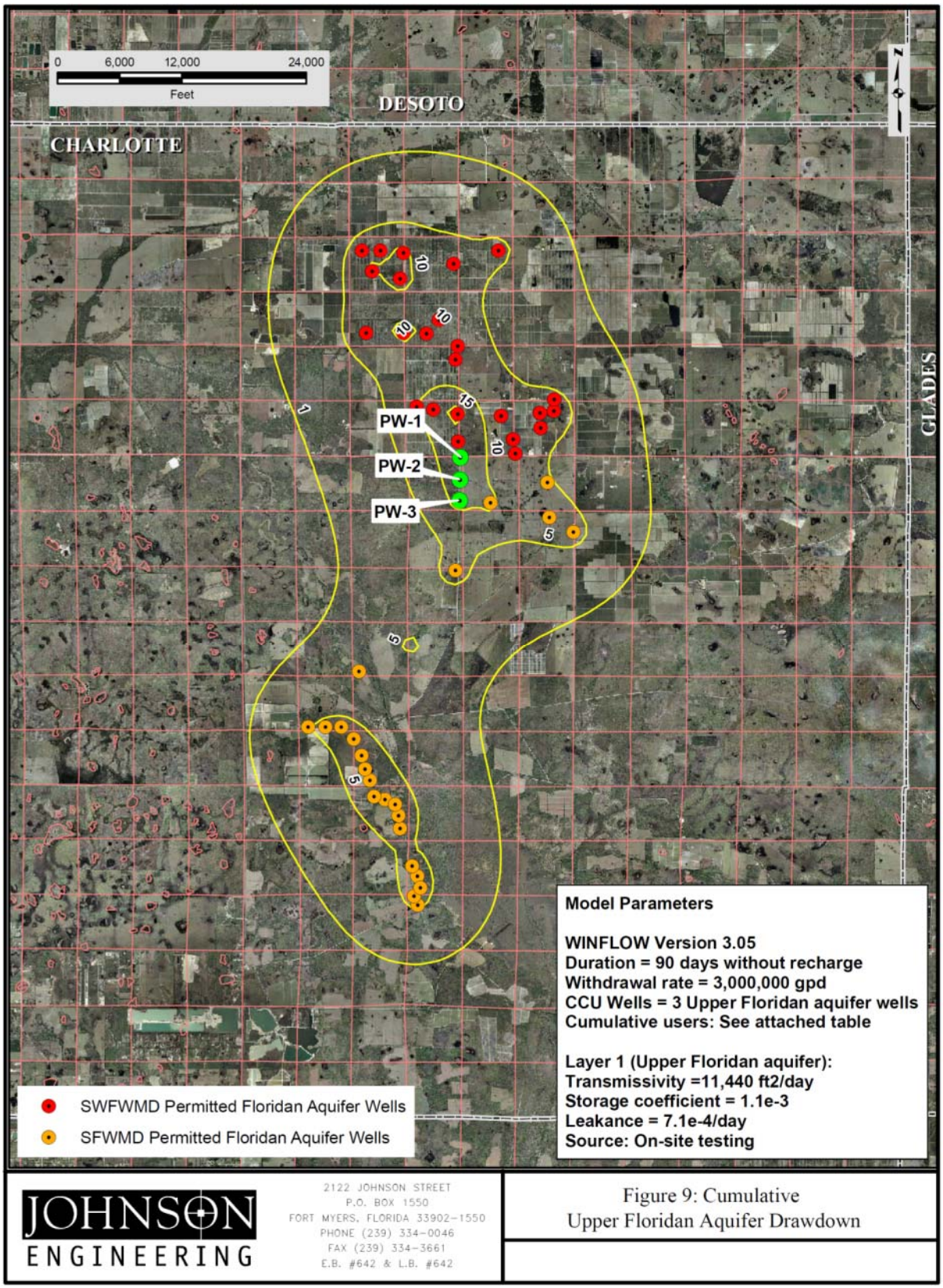


Figure 9. Predicted Floridan aquifer drawdown due to cumulative withdrawals.

8.0 WATER QUALITY ANALYSES

The collection of water quality samples occurred throughout the drilling and testing program, in order to assess changes in water quality with depth and address SFWMD concerns regarding the potential for upconing of saline water. Water quality samples were collected during the drilling of JE-1503 when using the reverse air method, as well as at discrete depths during geophysical logging. Johnson Engineering personnel collected all of the water quality samples, and performed all field specific conductance analyses. All other water quality samples were sent to Benchmark EnviroAnalytical, Inc. for analysis by a NELAC-certified lab. Samples intended for analysis by Benchmark were collected in pre-labeled, laboratory-issued sample bottles and stored in coolers with ice prior to pick-up by or delivery to the lab within the specified hold time. Results of water quality analyses are provided in **Appendix I**.

Reverse Air Drilling

Water quality samples were collected from JE-1503 any time drilling was conducted using the reverse air method. A sample was collected after advancement of every other length of drill rod (each approximately 20 feet in length for a sampling increment of 40 feet). For each sampling event, Johnson Engineering personnel collected a water quality sample for analysis of specific conductance, total dissolved solids (TDS) and dissolved chloride by Benchmark. This sampling was intended to assess of changes in water quality with depth. Water quality samples were collected for the depths of 820, 860, 900, 940, 980, 1,020, 1,060, 1,100, 1,140, 1,180, and 1,200 feet bls. At the end of every rod (20 feet), Johnson Engineering personnel also performed a field measurement of specific conductance using a calibrated portable meter.

Johnson Engineering could not begin advancing the borehole using the reverse air method until approximately 860 feet bls due to the presence of sand. By the time the reverse air method could be employed, all of the major production zones had been intersected previously using mud rotary drilling. As a result, the water data collected do not show any clear trends with depth, since the tested interval from 860 to 1,200 feet bls does not contribute appreciable flow to the well. All measured parameters remain fairly stable throughout this interval. See **Figure 10** for a plot of water quality with depth in JE-1503.

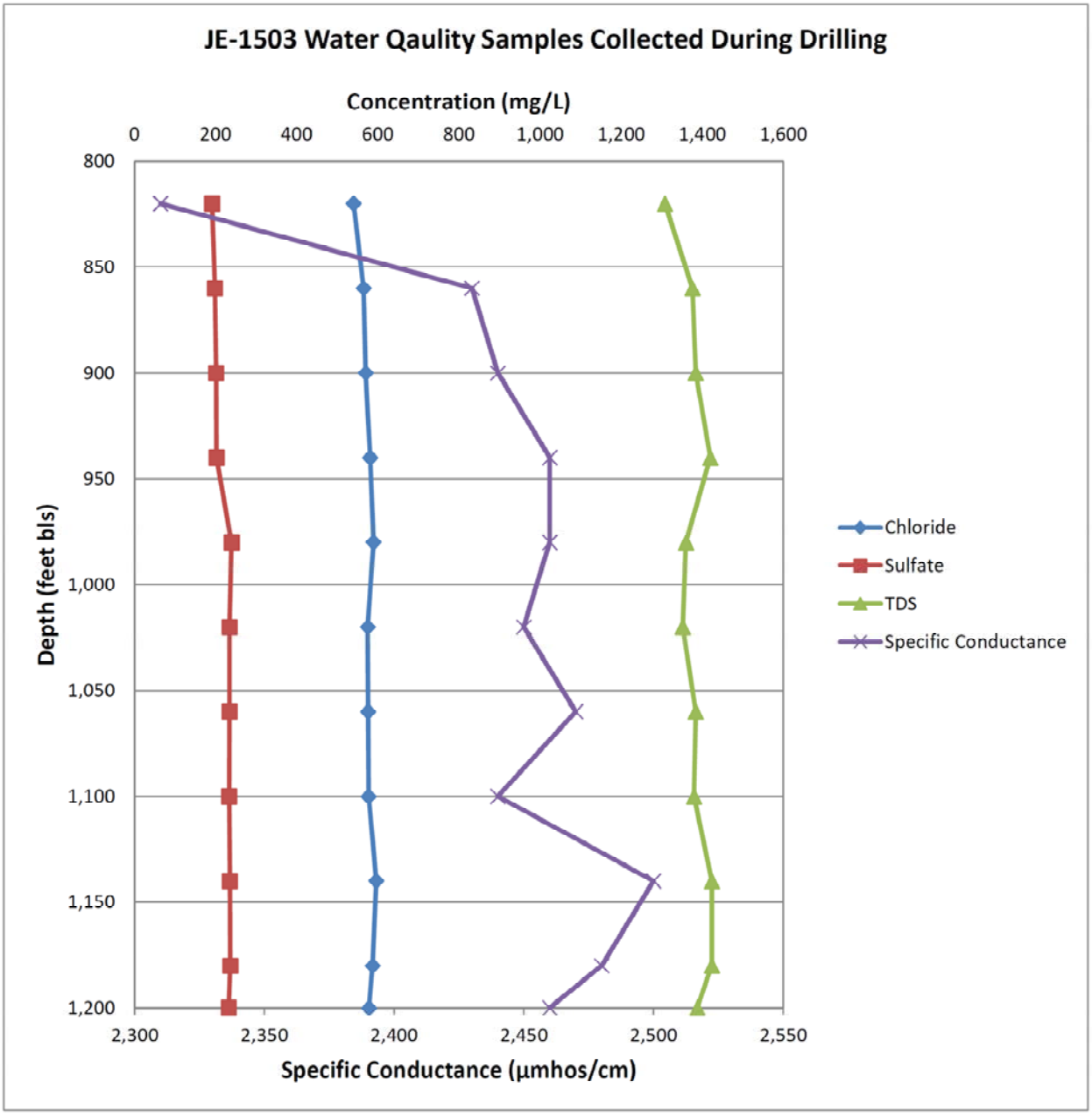


Figure 10. Results of water quality sampling collected during drilling using reverse air method .

Geophysical Logging

During the geophysical logging event on June 6, 2011, MV Geophysical collected grab samples from JE-1503 using a bailer at the discrete depths of 520, 620, 800, 1,000, and 1,180 feet bls. Prior to sample collection, the well had been shut in since June 1. Sampling was performed under static conditions in order to generate a profile of native formation water quality with depth. The samples collected were analyzed for dissolved chloride, sulfate, TDS and specific conductance by Benchmark. Results showed a gradual increase in all four parameters from 520 feet bls to a peak at 800 feet bls, after which point the values of all four parameters decreased until the bottom of the borehole. The values measured for 1,200 feet bls depth were lower than those measured at 520 feet bls in the case of all four parameters. See **Figure 11** for a plot of water quality with depth as sampled using the bailer method.

Aquifer Performance Testing

Water quality samples were collected daily during the pumping portion of the APT at 24, 48 and 72 hours from JE-1503. Water quality sampling consisted of chloride and specific conductance analysis by Johnson Engineering staff. The chloride concentrations from the three samples range from 582 to 591 mg/L, while specific conductance ranged from 2,060 to 2,270 µS/cm, with no discernable trends over time or between parameters. These results also agree well with those collected during drilling using the reverse air method for depths below 860 feet bls. This chloride value exceeds the FDEP secondary water quality standard for 250 mg/L set for chloride.

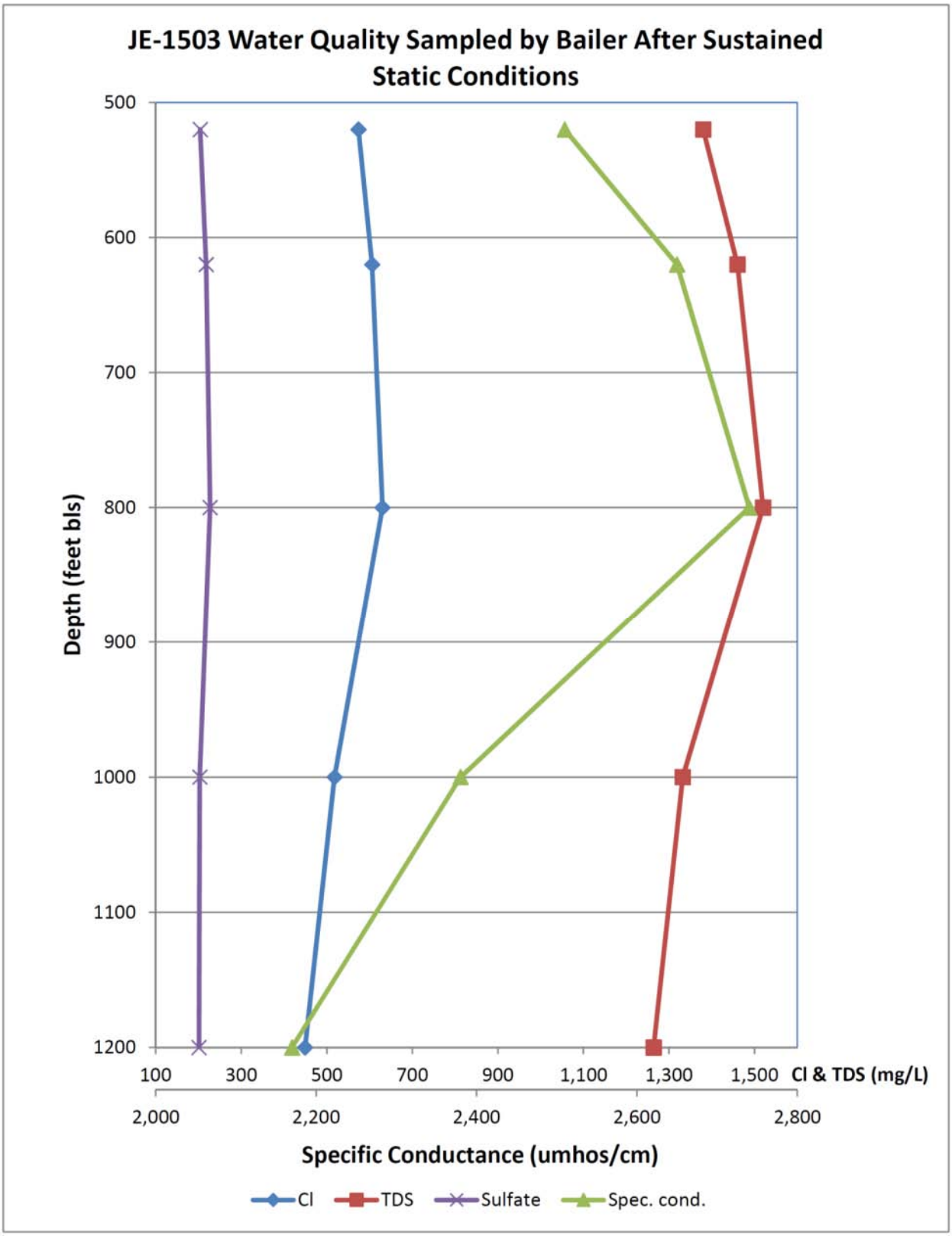


Figure 11. Results of water quality sampling collected using a bailer .

9.0 SUMMARY

Johnson Engineering prepared an Upper Floridan aquifer drilling and testing program to address questions from the SFWMD related to Charlotte County Utilities' water use permit application #071101-3 requesting a back-up supply allocation of 3 million gallon per day (mgd) from an Upper Floridan aquifer wellfield. Specifically, the program was designed to collect lithologic and water quality data to determine whether the requested production interval sources water from a single aquifer within the Floridan Aquifer System. The simplified drilling and testing program prepared by Johnson Engineering replaced an earlier program prepared by Malcolm Pirnie and submitted to the SFWMD. The Johnson Engineering program proposed construction three test/monitor wells open to the Surficial, Intermediate and Floridan Aquifer Systems, along with geophysical logging, flow measurement and water quality sampling performed during drilling, and a constant rate, 3-day APT on the Upper Floridan aquifer at the completion of test well construction. The plan was submitted to the SFWMD for review and approval prior to the commencement of test well construction.

From April to June 2011, Johnson Engineering constructed one Intermediate Aquifer System monitor well (JE-1501), one Surficial Aquifer System monitor well (JE-1502) and one 1,200-foot deep Upper Floridan aquifer monitor well (JE-1503) at a test site near the Charlotte County Utilities proposed Floridan aquifer wellfield site on the Babcock Ranch Preserve. Both the 470-foot-deep reamed borehole and 1,200-foot-deep borehole for JE-1503 were geophyscially logged, including collection of static and dynamic flow measurement and water quality samples at discrete depths within the borehole using a bailer. Water quality sampling and specific capacity testing was also conducted during drilling of JE-1503 when the reverse air drilling method could be utilized.

Results from the water quality analyses show the tested parameters remaining relatively stable with depth within the borehole down to 1,200 feet bls. No flow zones exist between approximately 860 and 1,200 feet bls at the location of JE-1503. A confining layer consisting of low permeability limestone occurs from approximately 860 to at least 1,200 feet bls and separates the fresher Upper Floridan aquifer production zone from the deeper, more saline portion of the aquifer, which was not encountered during drilling. Water quality within the Upper Floridan aquifer production zone has chloride concentrations approaching 600 mg/L, which

exceeds FDEP secondary drinking water standards and will require advanced treatment prior to use.

Once all three test/monitor wells had been completed, Johnson Engineering performed a 3-day constant rate aquifer performance test on the Upper Floridan aquifer and analyzed the resultant drawdown and recovery data. The test used JE-1503 as the pumping well and monitored water levels in all 3 test/monitor wells, as well as in an existing agricultural irrigation well open to the Upper Floridan aquifer and located proximate to the test site. Hydraulic parameters for the Upper Floridan aquifer calculated from the APT data were input into a WINFLOW model in order to predict the potential drawdown associated with CCU potable supply withdrawals from the Upper Floridan aquifer, as discussed in an advisory comment in the SFWMD's August 2010 letter. Johnson Engineering modeled proposed withdrawals by CCU alone, and then conducted a cumulative impact model including other permitted users of the Upper Floridan aquifer in both the SWFWMD and SFWMD. The results of the cumulative impact model predict approximately 12 feet of drawdown at the CCU Babcock Ranch wellfield due to the combined withdrawals.

Based on the results of the drilling and testing program, the proposed cased and total depths of the Upper Floridan aquifer production wells were revised to 660 and 900 feet bls, respectively, to coincide with depths of production zones encountered during drilling. The revised depths are greater than those proposed in the original water use permit application. A revised wellfield lay-out consisting of three production wells was prepared to provide the requested allocation of 3 mgd. On August 24, 2011, Johnson Engineering submitted a response to the SFWMD August 2010 request for additional information that included lithologic, geophysical and water quality data collected during the drilling and testing program, results of the aquifer performance testing and data analysis, revised drawdown modeling, revised well depths, and a revised wellfield lay-out.

Appendix A

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

August 4, 2010

Ms. Terri Kesner, Acting Director
Charlotte County Utilities
25550 Harbor View Road, Unit 1
Port Charlotte, FL 33980

Dear Ms. Kesner:

Subject: Water Use Permit Application No. 071101-3
Project: Charlotte County Babcock Ranch Water Supply
County: Charlotte Sec 3,10,12,14,15/Twp 41S/R 26E

A review of the response to the October 15, 2009 request for additional information for the above project indicates that additional information will be required in order to complete the evaluation, pursuant to Rule 40E-1.603, Florida Administrative Code (F.A.C.). Please answer all parts of the following comments:

1. Please complete a monitor well and then submit lithologic and water quality information at various depths at the wellfield site that demonstrates that the production horizon is from a single aquifer system, pursuant to Rule 40E-3.502(1)(FAC).

Advisory Comments:

1. Upon receipt of the monitor well data, it will be reviewed to determine if an aquifer performance test (APT) will be required. If an APT is required, the model, upconing analysis and monitoring plan submittals will need to be updated to reflect the APT results.
2. Per your response and subsequent phone conversations, we will process the application for a secondary source of 3 MGD of raw water.

Electronic versions of applicable statutes, rules, permit applications, and forms may be found at the following internet address by selecting Application/Permit Information, then Water Use: http://my.sfwmd.gov/permitting

In accordance with Rule 40E-1.603(d), F.A.C., an extension to provide a complete response has been granted and a response is required by October 15, 2010 or the application may be processed for denial if not withdrawn by the applicant. Please use the enclosed transmittal form when responding and include four (4) copies of the information. Should you have any questions regarding this application or this letter, please contact me at (800) 432-2045 ext. 2026 or (561) 682-2026. Thank you for your cooperation in this matter.

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045
Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-4680 • www.sfwmd.gov

Ms. Terri Kesner – Charlotte County Utilities
Application No. 071101-3 - Charlotte County Babcock Ranch Water Supply
August 4, 2010

Sincerely,

Karin A. Smith, P.G.
Lead Hydrogeologist
Water Use Regulation Division
Water Supply Department

Enclosures: RAI Transmittal Form

c: Tonya Simmons, P.E. – Malcolm Pirnie
Scott Petersen - SWFWMD
Terry Holihen - Kitson and Partners

Ms. Terri Kesner – Charlotte County Utilities
Application No. 071101-3 - Charlotte County Babcock Ranch Water Supply
August 4, 2010

bc: Beth Ross – 1413
Terri Bates - 2111

Addresses:

Ms. Tonya Simmons, P.E.
Malcolm Pirnie
1300 East 8th Ave, Suite F100
Tampa, FL 33605

Mr. Scott Petersen
Southwest Florida Water Management District
6750 Fruitville Road
Sarasota, FL 34240

Mr. Terry Holihen
Kitson and Partners
17837 Murdock Circle
Port Charlotte, FL 33948

Appendix B

UPPER FLORIDAN AQUIFER DRILLING AND TESTING PLAN

CHARLOTTE COUNTY BABCOCK RANCH WATER SUPPLY

Submitted to:

South Florida Water Management District

Prepared for:

Charlotte County Utilities
25550 Harbor View Road, Unit 1
Port Charlotte, Florida 33980

Prepared by:

Johnson Engineering, Inc.
Post Office Box 1550
Fort Myers, Florida 33902

April 2011

PURPOSE

This drilling and testing program prepared in support of South Florida Water Management District (SFWMD) water use permit application #071101-3 intends to address SFWMD concerns regarding aquifer/production zone depths, hydraulic connectivity, and water quality variations with depth.

Charlotte County Utilities (CCU) submitted application #071101-3 in November 2007, originally requesting a public water supply allocation of approximately 24.5 million gallons per day (MGD) from an Upper Floridan aquifer wellfield located on lands of the Babcock Ranch Preserve owned by the State of Florida. The application was subsequently modified over the course of the next 3 years to reduce the requested allocation to 12.5 MGD, and then to the current requested amount of 3 MGD for back-up supply. The production wells proposed for CCU's back-up supply wellfield at Babcock Ranch have estimated cased and total depth of 500 and 750 feet, respectively. In a series of requests for additional information (RAIs), the SFWMD expressed concerns pertaining to whether the proposed cased and total depths will result in cross-connection of the Intermediate (Lower Hawthorn) and Floridan (Suwannee) aquifer systems, as well as whether withdrawal of the proposed allocation will cause upconing of saline groundwater that could potentially impact other legal existing users or the resource. Specifically, this drilling and testing program is designed to address Question #1 of the RAI from the SFWMD dated August 4, 2010, which reads:

> *Please complete a monitor well and then submit lithologic and water quality information at various depths at the wellfield site that demonstrate that the production horizon is from a single aquifer system, pursuant to Rule 40E-3.502(1)(FAC).*

This drilling and testing program replaces that prepared by Malcolm Pirnie and submitted to the SFWMD on June 26, 2008.

WELL CONSTRUCTION & TESTING PERFORMED DURING CONSTRUCTION

Three test/monitor wells are proposed at the Charlotte County Babcock Ranch Upper Floridan aquifer wellfield site. The three monitor wells will be constructed in the Surficial, Intermediate and Upper Floridan aquifers, respectively. Data obtained from these wells will be used in conjunction with information from other testing programs conducted in the vicinity, as well as from existing wells near the proposed wellfield site. Please see Figure 1 for the location of the proposed Charlotte County Utilities Babcock Ranch test site, along with selected existing wells in the vicinity and nearby test locations.

On April 12, 2011, the Florida Department of Environmental Protection granted permission to Charlotte County to access State lands to conduct the drilling and testing program, as described below. Please see attached for a copy of the letter of consent from the FDEP. The consent granted by the FDEP will remain in effect from the date of execution of the letter, as executed by Charlotte County on April 13, 2011, until December 30, 2011.

General Sampling Protocol

For all test/monitor well construction, well cuttings will be collected and described at 10-foot intervals or at major changes in lithology. Water quality sample collection for samples submitted to a NELAC-certified laboratory will follow the appropriate sample handling, preservation and chain-of-custody procedures, as established by the FDEP standard operating procedures adopted by Johnson Engineering (copy of this document is available upon request). Prior to sample collection, the well will be pumped via air-lift pumping until field parameters have stabilized, indicating that a sample indicative of the aquifer's native water quality is being obtained. Duplicate samples and sample blanks will also be collected. Samples will be collected using laboratory-supplied bottles for the appropriate analyte and then packed with ice in laboratory-supplied coolers and delivered to the laboratory following chain-of-custody procedures.

Intermediate Aquifer Test/Monitor Well

One 4-inch diameter Intermediate aquifer test/monitor well with a cased depth of approximately 100-150 feet below land surface (BLS) and a total depth of approximately 260 feet BLS will be constructed at the location shown on Figure 1. This well will be the first constructed. A 5-1/2-inch diameter pilot hole will be advanced to approximately 260 feet BLS. The pilot hole will then be reamed to an 8-inch diameter to approximately 100-150 feet BLS, or the selected cased depth based on the lithology encountered. Four-inch diameter Schedule 40 PVC well casing with a formation packer on the end will be installed and tremmie grouted using cement with 5% high yield drilling mud additive. The well will then be air-lift developed until reasonably clear.

Surficial Aquifer Test/Monitor Well

One 4-inch diameter Surficial aquifer test/monitor well with a cased depth of approximately 10 feet BLS and a total depth of approximately 20 feet BLS will be constructed at the location shown on Figure 1. An 8-inch diameter borehole will be advanced to approximately 20 feet BLS. Approximately 10 feet of 4-inch diameter Schedule 40 PVC well casing and 10 feet of 20 slot 4-inch diameter PVC well screen will be installed. A 6/20 silica sand gravel pack will be emplaced to approximately 5 feet above the top of the well screen. The remainder of the annular space will be grouted using cement with 5% high yield drilling mud additive. The well will then be air-lift developed until reasonably clear.

Upper Floridan Aquifer Test/Monitor Well

One 6-inch diameter Upper Floridan aquifer test/monitor well with a cased depth of approximately 450-500 feet BLS and a total depth of approximately 1,000 feet BLS will be constructed at the location shown on Figure 1. A 14-3/4-inch diameter borehole will be drilled to approximately 60 feet BLS, or based on lithology, and 10-inch diameter PVC surface casing installed and tremmie grouted using cement with 5% high yield drilling mud additive. A 5-1/2-inch diameter pilot hole will then be drilled to 450-500 feet BLS, or the selected cased depth as dictated by the lithology. The pilot hole will be geophysically logged for natural gamma and dual induction. The pilot hole will be reamed to 9-7/8-inches in diameter, and 6-inch diameter

Schedule 40 PVC well casing installed and pressure grouted using cement with 5% high yield drilling mud additive. The casing will be pressurized and the grout brought to land surface in one or more subsequent lifts using a tremmie grout method and cement with 5% high yield drilling mud additive.

Following installation of the casing, a 6-inch diameter borehole will be advanced to 1,000 feet BLS. During drilling of the open-hole interval of the well to 1,000 feet BLS, lithologic samples will be collected every 10 feet, or at major changes in lithology. Water quality samples will be collected every 20 feet and analyzed for specific conductance and total dissolved chloride by trained Johnson Engineering staff. Every 60 feet, a specific capacity test will be performed, at the end of which, water quality samples will be collected and analyzed for specific conductance, total dissolved solids (TDS), total dissolved chloride, sulfate, sodium and hardness by a certified analytical laboratory. The well will then be air-lift developed until reasonably clear.

Following completion of the borehole to 1,000 feet bls, the following static and dynamic geophysical logs will be performed:

- Caliper (static only)
- Natural gamma (static only)
- Dual induction
- Fluid resistivity
- Flow
- Temperature

The well may be back-plugged as necessary to isolate the targeted production interval, if geophysical logging and sampling during construction suggests the need for this.

UPPER FLORIDAN AQUIFER PERFORMANCE TESTING

Following completion of the Upper Floridan aquifer test/monitor well, Johnson Engineering will conduct a constant rate aquifer performance test as described below. A submersible pump will be installed in the Upper Floridan aquifer test well. The pump will be capable of producing a constant pumping rate determined based on the specific capacity testing performed as part of the construction/testing portion of this program. Prior to the commencement of the test, existing agricultural irrigation well JE-585, which is located a few hundred feet from the test well site, and cased to approximately 270 feet BLS and open to 551 feet BLS, and the Surficial aquifer, Intermediate aquifer and Upper Floridan aquifer test/monitor wells will be equipped with pressure transducers and dataloggers to monitor water levels at these sites. A minimum of 24 hours of background water level data will be collected at 15-minute intervals. A totalizing flowmeter will be installed on the discharge piping from the Upper Floridan aquifer test/,monitor well, which will route discharge water away from the test site, to record flow rate and total pumping volume for the duration of the test.

Immediately prior to beginning the pumping portion of the aquifer performance test (APT), the datalogger data collection interval for the instruments in the Upper Floridan aquifer test/monitor

well and JE-585 will be re-set to record data every second and then increase in graduated steps to 3-minute intervals for the duration of the pumping portion of the APT. The pumping portion of the test will maintain a constant flow rate for approximately 72 hours. Immediately prior to ending the pumping portion of the APT, the datalogger data collection interval for the instruments in the Upper Floridan aquifer test/monitor well and J-585 will be re-set to record data every second and then increase in graduated steps to 3-minute intervals for the duration of the recovery portion of the APT. The recovery portion of the APT will last for approximately 24 hours, or until water levels in the Upper Floridan aquifer test/monitor well have stabilized at or close to pre-APT values.

During the pumping portion of the APT, the flow rate will be verified every 24 hours using a second calibrated flowmeter as a reference. Water quality samples will also be collected and analyzed for specific conductance and total dissolved chloride. The pump installed in the Upper Floridan aquifer test/monitor well will be left in place until the completion of recovery data collection.

Prior to use of JE-585 as a monitor well during the APT, well construction details will be verified by video-logging and the main production interval of the well will be ascertained using a flow measuring device.

AQUIFER PERFORMANCE TEST DATA ANALYSIS

Johnson Engineering will analyze drawdown and recovery data collected during the APT to determine hydraulic parameters for the Upper Floridan aquifer targeted production interval using commonly accepted methods (i.e. Hantush and Jacob, 1955; Theis Recovery, 1946). Water quality profiles using data collected during well construction, as well as plots of water quality measurements with time collected during the APT, will be prepared. Water level from all the wells monitored will also be evaluated to address the SFWMD's question as to whether the proposed Upper Floridan aquifer production interval will result in cross-connection of hydraulically separate aquifers or an unacceptable degradation in water quality.

Florida Department of
Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

April 12, 2011

Mr. Raymond Sandrock
18500 Murdock Circle
Port Charlotte, Florida 33948

RE: Charlotte County, Babcock Ranch/Well Motoring Project

Dear Mr. Raymond:

This letter will serve as consent for Charlotte County, its officers, employees, agents, and contractors to enter the property described above for well monitoring. This consent does not waive the authority and/or jurisdiction of any governmental entity, nor does it disclaim any title interest that the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Board of Trustees) may have in this property. This consent shall take effect on the date of execution of this letter of consent by Charlotte County and shall continue until December 30, 2011.

For this consent to be valid, an authorized representative of Charlotte County must sign below and return this letter to my attention at the letterhead address (directed to Mail Station 130) or by email to gloria.barber@dep.state.fl.us. Charlotte County agrees to assume all liability in case of personal injury or property damage related to the activities of its officers, employees, agents, and contractors.

Sincerely,

Gloria C. Barber

Gloria C. Barber, CPM
Operations and Management Consultant Manager
Bureau of Public Land Administration
Division of State Lands

Charlotte County acknowledges receipt of the above consent letter and agrees to the terms and conditions set forth herein.

CHARLOTTE COUNTY:

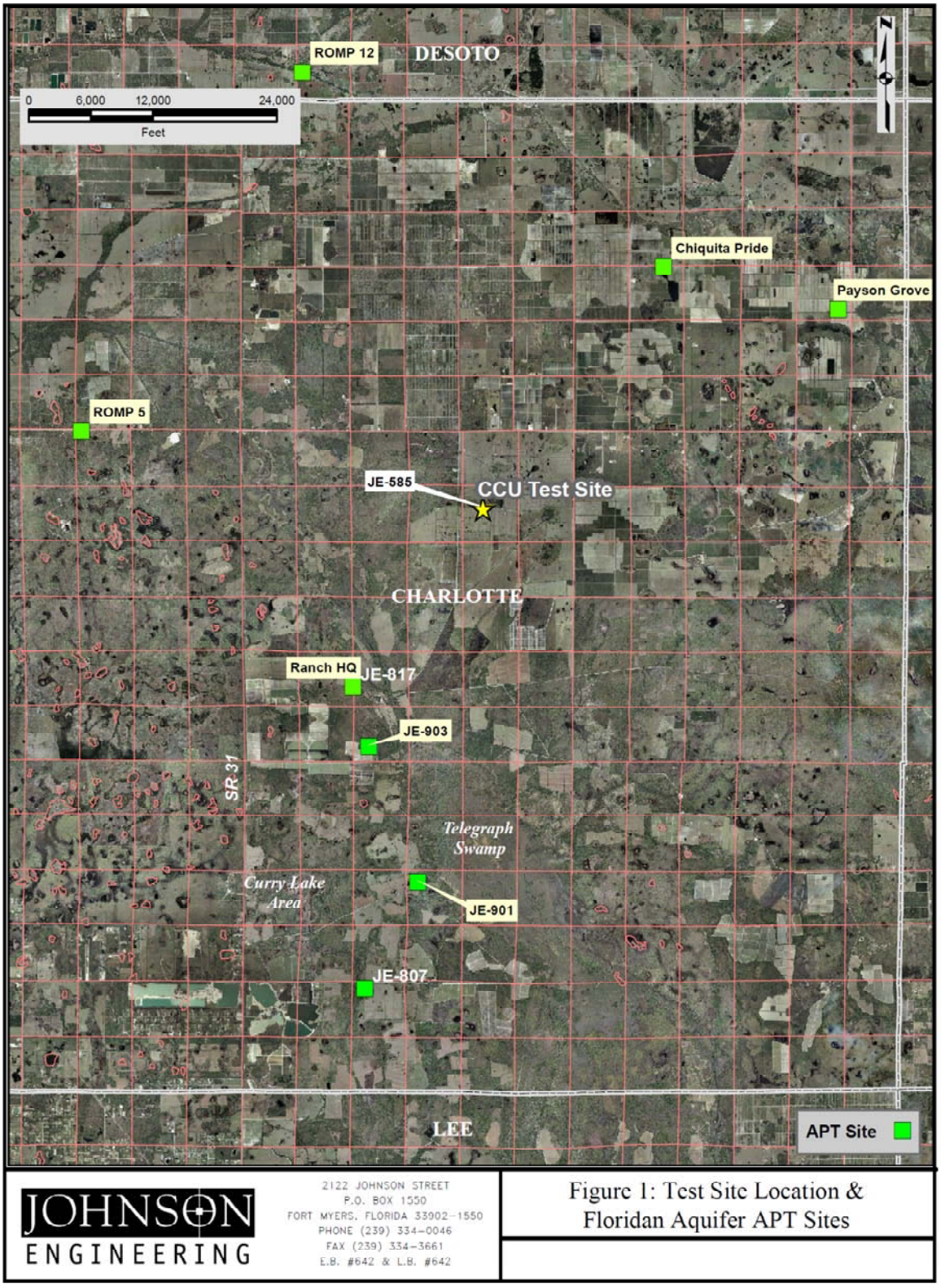
By Janette S. Knowlton
Signature

Charlotte County, County Attorney
Title

Janette S. Knowlton
Type or Print Name

4/13/11
Date

HR11-1280



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JOHNSON ENGINEERING

2122 JOHNSON STREET
P.O. BOX 1550
FORT MYERS, FLORIDA 33902-1550
PHONE (239) 334-0046
FAX (239) 334-3661
E.B. #642 & L.B. #642

Figure 1: Test Site Location & Floridan Aquifer APT Sites

Appendix C

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CON 24-06

April 28, 2011

PERMITTEE
CHARLOTTE COUNTY UTILITIES
25550 HARVOR VIEW ROAD, UNIT 1
PORT CHARLOTTE, FL 33980

CONTRACTOR
HOWARD, LONNIE VANCE
P.O. BOX 1550
FORT MYERS, FL 33902-1550
LICENSE NO:7177

WATER WELL CONSTRUCTION PERMIT #SF042211A
EXPIRATION DATE:October 28, 2011

PROJECT: SURFICIAL MONITOR WELL 45501 BERMONT RD. CHARLOTTE COUNTY
TYPE OF USE: MONITOR
COUNTY: CHARLOTTE SEC: 11 TWP: 41 RGE: 26

WELL CONSTRUCTION SPECIFICATIONS:	**INNER**	**OUTER**
CASING DIAMETER	**4"**	
CASING DEPTH:	**10.00'**	
SCREENED INTERVAL:	10.00'	20.00'
OPEN HOLE INTERVAL		
TOTAL DEPTH OF WELL:	20.00'	

GROUT REQUIREMENT
Inner casing shall be grouted bottom to top.

See additional conditions of permit on attached sheet.

We appreciate your assistance and cooperation in better managing the water resources of the District. If you have any questions on this matter, please call Ann-Marie Superchi at extension 6929.

Sincerely,

Ann Marie Superchi

Ann Marie Superchi, Well Permitting
Water Use Division
South Florida Water Management District

Attachment: Additional Conditions of Permit

c:

SURFICIAL MONITOR WELL 45501 BERMONT RD. CHARLOTTE COUNTY
April 28, 2011

ADDITIONAL CONDITIONS OF PERMIT

COMPLETION REPORT REQUIRED

A Water Well Completion Report (Form 0124) must be filed with the District within 30 days of completion of work.

bc: WU Permit # 071101-3
DAY FILE
PERMIT FILE

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

☐ Southwest
☐ Northwest
☐ St. Johns River
☑ South Florida
☐ Suwannee River
☐ DEP
☐ Delegated Authority (If Applicable) _____

PLEASE FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

The water well contractor is responsible for completing this form and forwarding the permit application to the appropriate delegated authority where applicable.

Permit No. SF042241/A
Florida Unique ID _____
Permit Stipulations Required (See Attached)
62-524 Quad No. _____ Delineation No. _____
CUP/WUP Application No. _____
ABOVE THIS LINE - FOR OFFICIAL USE ONLY

1. Charlotte County Utilities | 25550 Harbor View Road, Unit 1, Port Charlotte, FL 33980 | 941-764-4300
*Owner, Legal Name if Corporation | *Address | *City | *State | *ZIP | Telephone Number
2. 45501 Bermont Road, Charlotte County, Florida
*Well Location - Address, Road Name or Number, City
3. 422707100001 | Lot | Block | Unit
*Parcel ID No. (PIN) or Alternate Key (Circle One)
4. 11 | 41 | 26 | Charlotte | Subdivision | Check if 62-524: ☐ Yes ☑ No
*Section or Land Grant | *Township | *Range | *County
5. Lonnie V. Howard | 7177 | 239-334-0046 | lvh@johnsoneng.com
*Water Well Contractor | *License Number | *Telephone Number | E-mail Address
6. PO Box 1550 | Fort Myers | FL | 33902
*Water Well Contractor's Address | City | State | ZIP
7. *Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment _____
*Reason for Repair, Modification, or Abandonment
8. *Number of Proposed Wells 3
9. *Specify Intended Use(s) of Well(s):

☐ Domestic	☐ Landscape Irrigation	☐ Agricultural Irrigation	☐ Site Investigations
☐ Bottled Water Supply	☐ Recreation Area Irrigation	☐ Livestock	☑ Monitoring
☐ Public Water Supply (Limited Use/DOH)		☐ Nursery Irrigation	☐ Test
☐ Public Water Supply (Community or Non-Community/DEP)		☐ Commercial/Industrial	☐ Earth-Coupled Geothermal
☐ Class I Injection		☐ Golf Course Irrigation	☐ HVAC Supply
			☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☐ Drainage
Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____
☐ Other (Describe) _____

Date Stamp
Official Use Only

10. *Distance from Septic System if ≤ 200 ft. N/A | 11. Facility Description _____ | 12. Estimated Start Date 4/27/2011
13. *Estimated Well Depth 20 ft. *Estimated Casing Depth 10 ft. Primary Casing Diameter 4 in. Open Hole: From ____ To ____ ft.
14. Estimated Screen Interval: From 10 To 20 ft.
15. *Primary Casing Material: Black Steel | Galvanized | ✓ PVC | Stainless Steel | Not Cased | Other: _____
16. Secondary Casing: Telescope Casing | Liner | Surface Casing | Diameter _____ in.
17. Secondary Casing Material: Black Steel | Galvanized | PVC | Stainless Steel | Other _____
18. *Method of Construction, Repair, or Abandonment: Auger | Cable Tool | Jetted | ✓ Rotary | Sonic | Combination (Two or More Methods) | Hand Driven (Well Point, Sand Point) | Hydraulic Point (Direct Push) | Horizontal Drilling | Plugged by Approved Method | Other (Describe) _____
19. Proposed Grouting Interval for the Primary, Secondary, and Additional Casing:

From 0 To 5	Seal Material (	Bentonite	Neat Cement	✓ Other Type I/II with 5%)
From ____ To ____	Seal Material (	Bentonite	Neat Cement	Other ____)
From ____ To ____	Seal Material (	Bentonite	Neat Cement	Other ____)
From ____ To ____	Seal Material (	Bentonite	Neat Cement	Other ____)

20. Indicate total number of existing wells on site 0 | List number of existing unused wells on site 0
21. *Is this well or any existing well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ✓ Yes No If yes, complete the following: CUP/WUP No. #071101-3 | District Well ID No. _____
22. Latitude 26d 55' 29.90" | Longitude 81d 41' 21.18"
23. Data Obtained From: GPS ✓ Map Survey | Datum: ____NAD 27 ____NAD 83 X WGS 84

I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided in this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after completion of the construction, repair, modification, or abandonment authorized by this permit, or the permit expiration, whichever occurs first.

*Signature of Contractor | 7177 *License No.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of their responsibilities as stated above. Owner consents to allowing personnel of this WMD or Delegated Authority access to the well site during the construction, repair, modification, or abandonment authorized by this permit.

Jerri Flesner 4/22/2011
*Signature of Owner or Agent | *Date

BELOW THIS LINE - FOR OFFICIAL USE ONLY

Approval Granted By Ann Marie Supeene | Issue Date 4-28-11 | Expiration Date 10-28-11 | Hydrologist Approval _____ Initials
Fee Received $ 100.00 | Receipt No. 11-2490-036 | Check No. 17398

THIS PERMIT IS NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD OR DELEGATED AUTHORITY. THE PERMIT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL CONSTRUCTION, REPAIR, MODIFICATION, OR ABANDONMENT ACTIVITIES.

DEP Form: 62-532.900(1) Incorporated in 62-532.400(1), F.A.C. Effective Date: October 7, 2010 | Page 1 of 2

Permit No. SF042721A

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

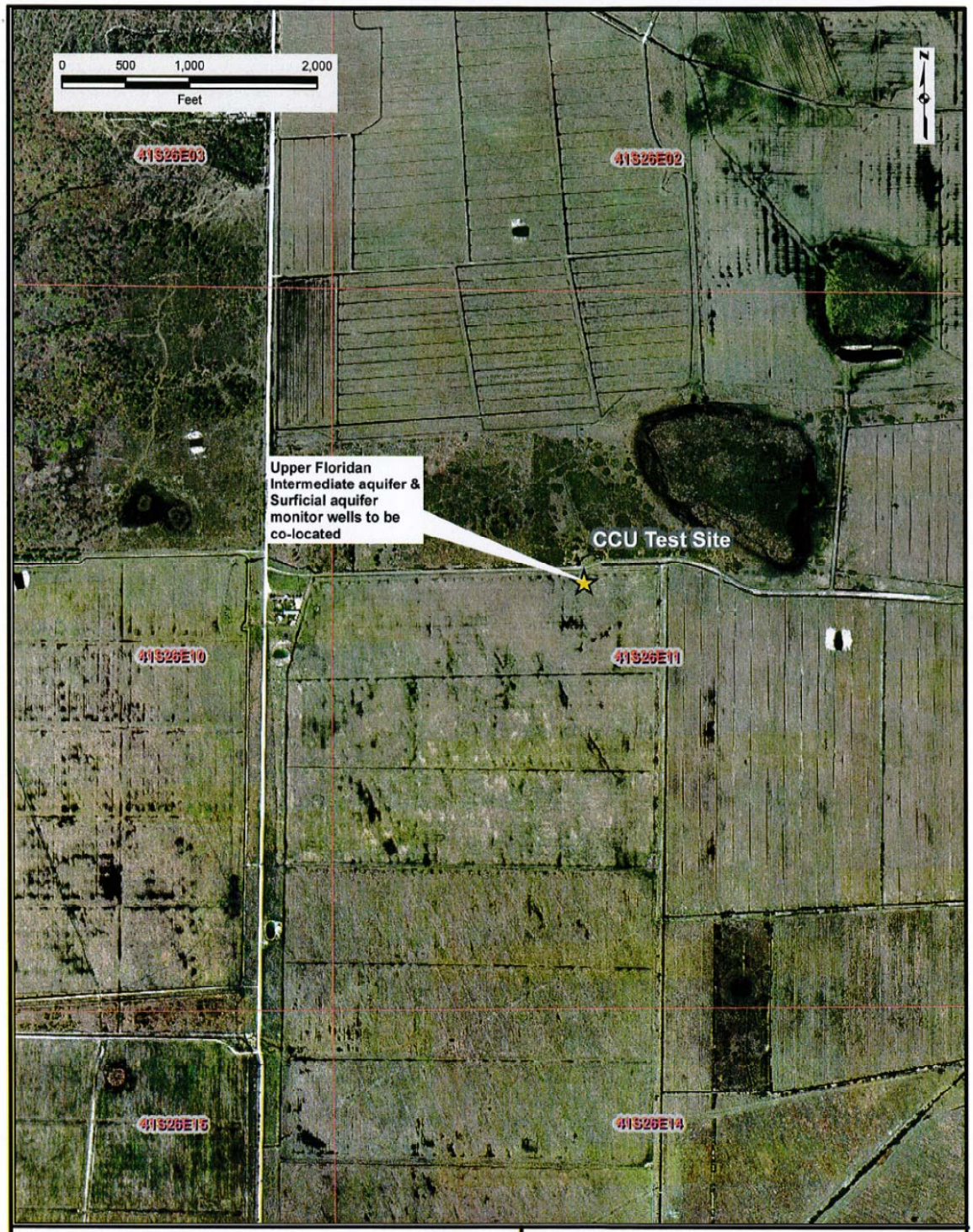
SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

Comments:
Please see attached

***General Site Map of Proposed Well Location**

N

Identify known roads and landmarks. Give distances from all reference points or structures, septic systems, sanitary hazards, and contamination sources, if applicable.



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JOHNSON ENGINEERING

2122 JOHNSON STREET
P.O. BOX 1550
FORT MYERS, FLORIDA 33902-1550
PHONE (239) 334-0046
FAX (239) 334-3661
E.B. #642 & L.B. #642

Test Site Location:
SW 1/4 of SE 1/4 of NW 1/4 of S11/T41/R 26

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Miscellaneous Cash Receipt

RECEIVED
APR 28 2011
ACCOUNTING

Receipt Number 09 - 2490 - 036

Received:
Date 04/22/11

Prepared by A. Superchi Date 04/25/11
Received by Date 04/25/11

From JOHNSON ENGINEERING
Address P.O. BOX 1550
City FORT MYERS State FL Zip 33902
Phone 239-334-0046

Check One
☐ Cash
☐ Check No. 17398

Text Well Construction Permits SF042211ABC Charlotte Co. Utility 3 monitor wells Babcock

4 6 2 0 0 0 4 3 1 1 1 5 7 0 0 0 H B 0 0 4 0 4 8 1 5 7 0 1 0 1 0 0 0 $ 300.00

Text $

Text $

Text $

Text $

Text $

Text $

Subtotal	$300.00
Florida Sales Tax *	
Shipping & Handling	
TOTAL	$300.00

Additional Comments

*N/A - Copies of Public Records - F.S. 212.05
*Exemption Number, If Applicable

Form 0137 (04/2008)

Page 1 of 1

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CON 24-06

April 28, 2011

PERMITTEE
CHARLOTTE COUNTY UTILITIES
25550 HARVOR VIEW ROAD, UNIT 1
PORT CHARLOTTE, FL 33980

CONTRACTOR
HOWARD, LONNIE VANCE
P.O. BOX 1550
FORT MYERS, FL 33902-1550
LICENSE NO:7177

WATER WELL CONSTRUCTION PERMIT #SF042211B
EXPIRATION DATE:October 28, 2011

PROJECT: INTERMEDIATE MONITOR WELL 45501 BERMONT RD. CHARLOTTE COUNTY
TYPE OF USE: MONITOR
COUNTY: CHARLOTTE SEC: 11 TWP: 41 RGE: 26

WELL CONSTRUCTION SPECIFICATIONS:	**INNER**	**OUTER**
CASING DIAMETER	**4"**	
CASING DEPTH:	**100.00'**	
SCREENED INTERVAL:		
OPEN HOLE INTERVAL	100' – 260'	
TOTAL DEPTH OF WELL:	260.00'	

GROUT REQUIREMENT
Inner casing shall be grouted bottom to top.

See additional conditions of permit on attached sheet.

We appreciate your assistance and cooperation in better managing the water resources of the District. If you have any questions on this matter, please call Ann-Marie Superchi at extension 6929.

Sincerely,

Ann Marie Superchi, Well Permitting
Water Use Division
South Florida Water Management District

Attachment: Additional Conditions of Permit

c:

INTERMEDIATE MONITOR WELL 45501 BERMONT RD. CHARLOTTE COUNTY
April 28, 2011

ADDITIONAL CONDITIONS OF PERMIT

COMPLETION REPORT REQUIRED

A Water Well Completion Report (Form 0124) must be filed with the District within 30 days of completion of work.

bc: WU Permit # 071101-3
DAY FILE
PERMIT FILE

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

☐ Southwest
☐ Northwest
☐ St. Johns River
☑ South Florida
☐ Suwannee River
☐ DEP
☐ Delegated Authority (If Applicable) _____

PLEASE FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

The water well contractor is responsible for completing this form and forwarding the permit application to the appropriate delegated authority where applicable.

Permit No. SF042211 B
Florida Unique ID _____
Permit Stipulations Required (See Attached) _____
62-524 Quad No. _____ Delineation No. _____
CUP/WUP Application No. _____
ABOVE THIS LINE - FOR OFFICIAL USE ONLY

1. Charlotte County Utilities | 25550 Harbor View Road, Unit 1, Port Charlotte, FL 33980 | 941-764-4300
*Owner, Legal Name if Corporation | *Address | *City | *State | *ZIP | Telephone Number
2. 45501 Bermont Road, Charlotte County, Florida
*Well Location - Address, Road Name or Number, City
3. 422707100001 | Lot | Block | Unit
*Parcel ID No. (PIN) or Alternate Key (Circle One)
4. 11 | 41 | 26 | Charlotte | Check if 62-524: ☐ Yes ☑ No
*Section or Land Grant | *Township | *Range | *County | Subdivision
5. Lonnie V. Howard | 7177 | 239-334-0046 | lvh@johnsoneng.com
*Water Well Contractor | *License Number | *Telephone Number | E-mail Address
6. PO Box 1550 | Fort Myers | FL | 33902
*Water Well Contractor's Address | City | State | ZIP
7. *Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment _____
*Reason for Repair, Modification, or Abandonment
8. *Number of Proposed Wells 3
9. *Specify Intended Use(s) of Well(s):

☐ Domestic	☐ Landscape Irrigation	☐ Agricultural Irrigation	☐ Site Investigations
☐ Bottled Water Supply	☐ Recreation Area Irrigation	☐ Livestock	☑ Monitoring
☐ Public Water Supply (Limited Use/DOH)		☐ Nursery Irrigation	☐ Test
☐ Public Water Supply (Community or Non-Community/DEP)		☐ Commercial/Industrial	☐ Earth-Coupled Geothermal
☐ Class I Injection		☐ Golf Course Irrigation	☐ HVAC Supply
			☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☐ Drainage
Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____
☐ Other (Describe) _____

Date Stamp
Official Use Only

10. *Distance from Septic System if ≤ 200 ft: N/A | 11. Facility Description _____ | 12. Estimated Start Date 4/27/2011
13. *Estimated Well Depth 260 ft. | *Estimated Casing Depth 100 ft. | Primary Casing Diameter 4 in. | Open Hole: From 100 To 260 ft.
14. Estimated Screen Interval: From N/A To _____ ft.
15. *Primary Casing Material: Black Steel ☐ Galvanized ✓ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other: _____
16. Secondary Casing: ☐ Telescope Casing ☐ Liner ☐ Surface Casing Diameter _____ in.
17. Secondary Casing Material: ☐ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Other _____
18. *Method of Construction, Repair, or Abandonment: ☐ Auger ☐ Cable Tool ☐ Jetted ✓ Rotary ☐ Sonic ☐ Combination (Two or More Methods) ☐ Hand Driven (Well Point, Sand Point) ☐ Hydraulic Point (Direct Push) ☐ Horizontal Drilling ☐ Plugged by Approved Method ☐ Other (Describe) _____
19. Proposed Grouting Interval for the Primary, Secondary, and Additional Casing:

From 0 To 100	Seal Material (	☐ Bentonite	☐ Neat Cement	✓ Other Type I/II with 5%	)
From _____ To _____	Seal Material (	☐ Bentonite	☐ Neat Cement	☐ Other _____	)
From _____ To _____	Seal Material (	☐ Bentonite	☐ Neat Cement	☐ Other _____	)
From _____ To _____	Seal Material (	☐ Bentonite	☐ Neat Cement	☐ Other _____	)

20. Indicate total number of existing wells on site 0 | List number of existing unused wells on site 0
21. *Is this well or any existing well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ✓ Yes ☐ No If yes, complete the following: CUP/WUP No. #071101-3 | District Well ID No. _____
22. Latitude 26d 55' 29.90" | Longitude 81d 41' 21.18"
23. Data Obtained From: ☐ GPS ✓ Map ☐ Survey | Datum: ☐ NAD 27 ☐ NAD 83 X WGS 84

I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided in this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after completion of the construction, repair, modification, or abandonment authorized by this permit, or the permit expiration, whichever occurs first.

*Signature of Contractor | 7177 *License No.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of their responsibilities as stated above. Owner consents to allowing personnel of this WMD or Delegated Authority access to the well site during the construction, repair, modification, or abandonment authorized by this permit.

*Signature of Owner or Agent | 4/22/2011 *Date

BELOW THIS LINE - FOR OFFICIAL USE ONLY

Approval Granted By _____ | Issue Date 4-28-11 | Expiration Date 10-28-11 | Hydrologist Approval _____ Initials
Fee Received $ 100.00 | Receipt No. 11-2490-036 | Check No. 17398

THIS PERMIT IS NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD OR DELEGATED AUTHORITY. THE PERMIT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL CONSTRUCTION, REPAIR, MODIFICATION, OR ABANDONMENT ACTIVITIES.

Permit No. SFO422118

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

Comments:
Please see attached

***General Site Map of Proposed Well Location**

N

Identify known roads and landmarks. Give distances from all reference points or structures, septic systems, sanitary hazards, and contamination sources, if applicable.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CON 24-06

April 28, 2011

PERMITTEE
CHARLOTTE COUNTY UTILITIES
25550 HARVOR VIEW ROAD, UNIT 1
PORT CHARLOTTE, FL 33980

CONTRACTOR
HOWARD, LONNIE VANCE
P.O. BOX 1550
FORT MYERS, FL 33902-1550
LICENSE NO:7177

WATER WELL CONSTRUCTION PERMIT #SF042211C
EXPIRATION DATE:October 28, 2011

PROJECT: UPPER FLORIDAN MONITOR WELL 45501 BERMONT RD. CHARLOTTE CO.
TYPE OF USE: MONITOR
COUNTY: CHARLOTTE SEC: 11 TWP: 41 RGE: 26

WELL CONSTRUCTION SPECIFICATIONS:	**INNER**	**OUTER**
CASING DIAMETER	**6"**	
CASING DEPTH:	**450.00'**	
SCREENED INTERVAL:		
OPEN HOLE INTERVAL	450' – 1200' * SEE CONDITION	
TOTAL DEPTH OF WELL:	1200.00'	

GROUT REQUIREMENT
Inner casing shall be grouted bottom to top.

See additional conditions of permit on attached sheet.

We appreciate your assistance and cooperation in better managing the water resources of the District. If you have any questions on this matter, please call Ann-Marie Superchi at extension 6929.

Sincerely,

Ann Marie Superchi

Ann Marie Superchi, Well Permitting
Water Use Division
South Florida Water Management District

Attachment: Additional Conditions of Permit

c:

UPPER FLORIDAN MONITOR WELL 45501 BERMONT RD. CHARLOTTE CO.
April 28, 2011

ADDITIONAL CONDITIONS OF PERMIT

*1 THIS IS A DUAL ZONE MONITOR WELL. THE FRESH PRODUCTION ZONE WILL NOT BE OPEN TO MORE SALINE ZONES.

COMPLETION REPORT REQUIRED

A Water Well Completion Report (Form 0124) must be filed with the District within 30 days of completion of work.

bc: WU Permit # 071101-3
DAY FILE
PERMIT FILE

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

☐ Southwest
☐ Northwest
☐ St. Johns River
☑ South Florida
☐ Suwannee River
☐ DEP
☐ Delegated Authority (If Applicable) _____

PLEASE FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

The water well contractor is responsible for completing this form and forwarding the permit application to the appropriate delegated authority where applicable.

Permit No. SF0422411C
Florida Unique ID _____
Permit Stipulations Required (See Attached)
62-524 Quad No. _____ Delineation No. _____
CUP/WUP Application No. _____
ABOVE THIS LINE - FOR OFFICIAL USE ONLY

1. Charlotte County Utilities | 25550 Harbor View Road, Unit 1, Port Charlotte, FL 33980 | 941-764-4300
*Owner, Legal Name if Corporation | *Address | *City | *State | *ZIP | Telephone Number
2. 45501 Bermont Road, Charlotte County, Florida
*Well Location - Address, Road Name or Number, City
3. 422707100001
*Parcel ID No. (PIN) or Alternate Key (Circle One) | Lot | Block | Unit
4. 11 | 41 | 26 | Charlotte | _____ | Check if 62-524: ☐ Yes ☑ No
*Section or Land Grant | *Township | *Range | *County | Subdivision
5. Lonnie V. Howard | 7177 | 239-334-0046 | lvh@johnsoneng.com
*Water Well Contractor | *License Number | *Telephone Number | E-mail Address
6. PO Box 1550 | Fort Myers | FL | 33902
*Water Well Contractor's Address | City | State | ZIP
7. *Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment _____
*Reason for Repair, Modification, or Abandonment
8. *Number of Proposed Wells 3
9. *Specify Intended Use(s) of Well(s):

☐ Domestic	☐ Landscape Irrigation	☐ Agricultural Irrigation	☐ Site Investigations
☐ Bottled Water Supply	☐ Recreation Area Irrigation	☐ Livestock	☑ Monitoring
☐ Public Water Supply (Limited Use/DOH)		☐ Nursery Irrigation	☐ Test
☐ Public Water Supply (Community or Non-Community/DEP)		☐ Commercial/Industrial	☐ Earth-Coupled Geothermal
☐ Class I Injection		☐ Golf Course Irrigation	☐ HVAC Supply
			☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☐ Drainage
Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____
☐ Other (Describe) _____

Date Stamp
Official Use Only

10. *Distance from Septic System if ≤ 200 ft N/A 11. Facility Description _____ 12. Estimated Start Date 5/2/2011
13. *Estimated Well Depth 1,200 ft. *Estimated Casing Depth 450 ft. Primary Casing Diameter 6 in. Open Hole: From 450 To 1,200 ft.
14. Estimated Screen Interval: From N/A To _____ ft.
15. *Primary Casing Material: Black Steel ☐ Galvanized ✓ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other: _____
16. Secondary Casing: ☐ Telescope Casing ☐ Liner ☐ Surface Casing Diameter _____ in.
17. Secondary Casing Material: ☐ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Other _____
18. *Method of Construction, Repair, or Abandonment: ☐ Auger ☐ Cable Tool ☐ Jetted ✓ Rotary ☐ Sonic ☐ Combination (Two or More Methods) ☐ Hand Driven (Well Point, Sand Point) ☐ Hydraulic Point (Direct Push) ☐ Horizontal Drilling ☐ Plugged by Approved Method ☐ Other (Describe) _____
19. Proposed Grouting Interval for the Primary, Secondary, and Additional Casing:

From 0	To 450	Seal Material (Bentonite	Neat Cement	✓ Other Type I/II with 5%)
From _____	To _____	Seal Material (Bentonite	Neat Cement	Other _____)
From _____	To _____	Seal Material (Bentonite	Neat Cement	Other _____)
From _____	To _____	Seal Material (Bentonite	Neat Cement	Other _____)

20. Indicate total number of existing wells on site 0 List number of existing unused wells on site 0
21. *Is this well or any existing well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ✓ Yes ☐ No If yes, complete the following: CUP/WUP No. #071101-3 District Well ID No. _____
22. Latitude 26d 55' 29.90" Longitude 81d 41' 21.18"
23. Data Obtained From: ☐ GPS ✓ Map ☐ Survey Datum: _____ NAD 27 _____ NAD 83 X WGS 84

I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided in this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after completion of the construction, repair, modification, or abandonment authorized by this permit, or the permit expiration, whichever occurs first.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of their responsibilities as stated above. Owner consents to allowing personnel of this WMD or Delegated Authority access to the well site during the construction, repair, modification, or abandonment authorized by this permit.

_____ | 7177 | _____ | _____
*Signature of Contractor | *License No. | *Signature of Owner or Agent | *Date

BELOW THIS LINE - FOR OFFICIAL USE ONLY

Approval Granted By Antonette Supervalia Issue Date 4-28-2011 Expiration Date 10-28-11 Hydrologist Approval — (Initials)
Fee Received $ 100.00 Receipt No. 11-2490-036 Check No. 17398

THIS PERMIT IS NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD OR DELEGATED AUTHORITY. THE PERMIT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL CONSTRUCTION, REPAIR, MODIFICATION, OR ABANDONMENT ACTIVITIES.

Permit No. SF042211C

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

Comments:
Please see attached

***General Site Map of Proposed Well Location**

N

Identify known roads and landmarks. Give distances from all reference points or structures, septic systems, sanitary hazards, and contamination sources, if applicable.

Appendix D

Florida Department of
Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

April 12, 2011

Mr. Raymond Sandrock
18500 Murdock Circle
Port Charlotte, Florida 33948

RE: Charlotte County, Babcock Ranch/Well Motoring Project

Dear Mr. Raymond:

This letter will serve as consent for Charlotte County, its officers, employees, agents, and contractors to enter the property described above for well monitoring. This consent does not waive the authority and/or jurisdiction of any governmental entity, nor does it disclaim any title interest that the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Board of Trustees) may have in this property. This consent shall take effect on the date of execution of this letter of consent by Charlotte County and shall continue until December 30, 2011.

For this consent to be valid, an authorized representative of Charlotte County must sign below and return this letter to my attention at the letterhead address (directed to Mail Station 130) or by email to gloria.barber@dep.state.fl.us. Charlotte County agrees to assume all liability in case of personal injury or property damage related to the activities of its officers, employees, agents, and contractors.

Sincerely,

Gloria C. Barber

Gloria C. Barber, CPM
Operations and Management Consultant Manager
Bureau of Public Land Administration
Division of State Lands

Charlotte County acknowledges receipt of the above consent letter and agrees to the terms and conditions set forth herein.

CHARLOTTE COUNTY:

By: Janette S. Knowlton
Signature

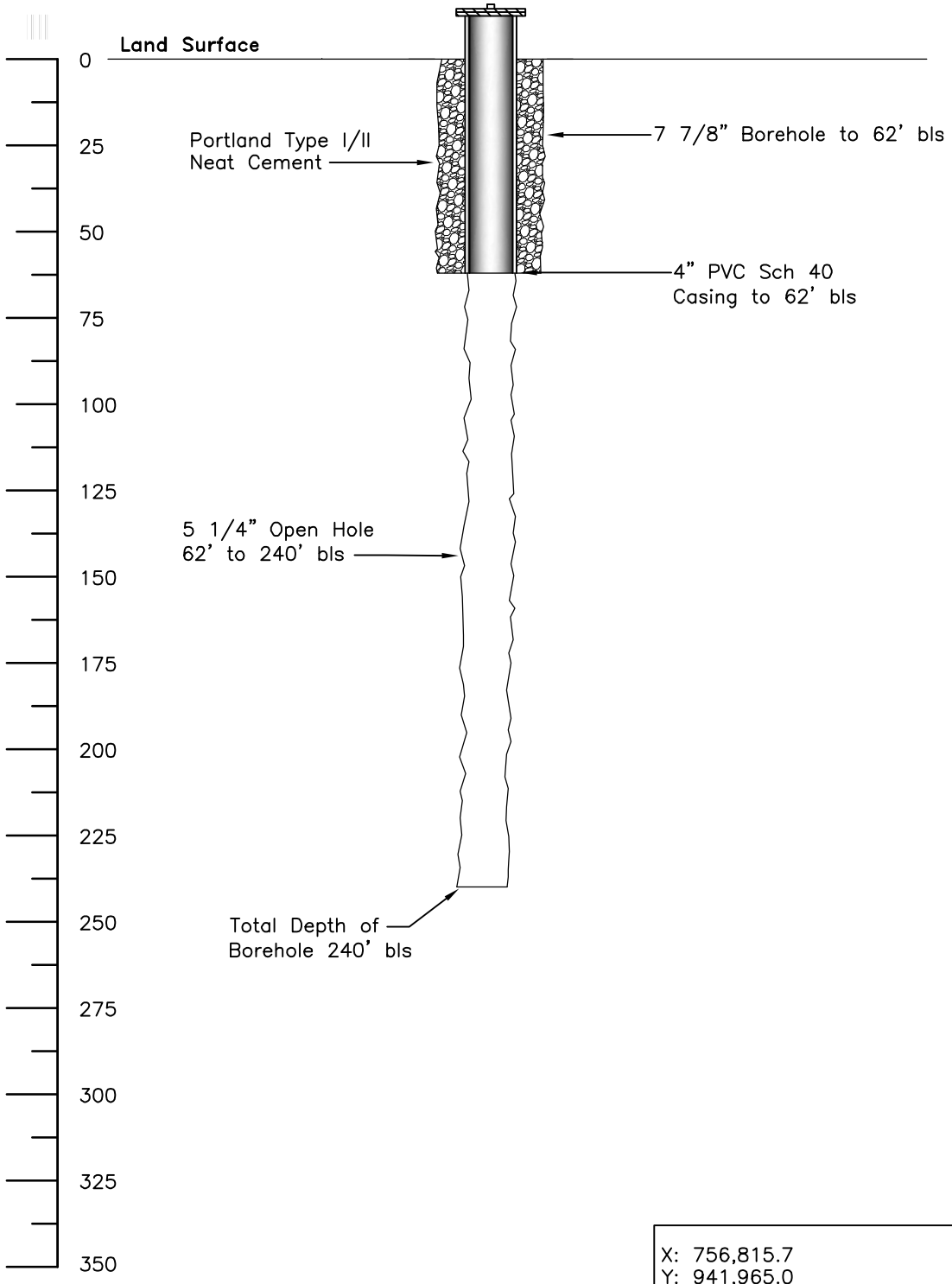
Charlotte County, County Attorney
Title

Janette S. Knowlton
Type or Print Name

4/13/11
Date

LR11-1280

Appendix E



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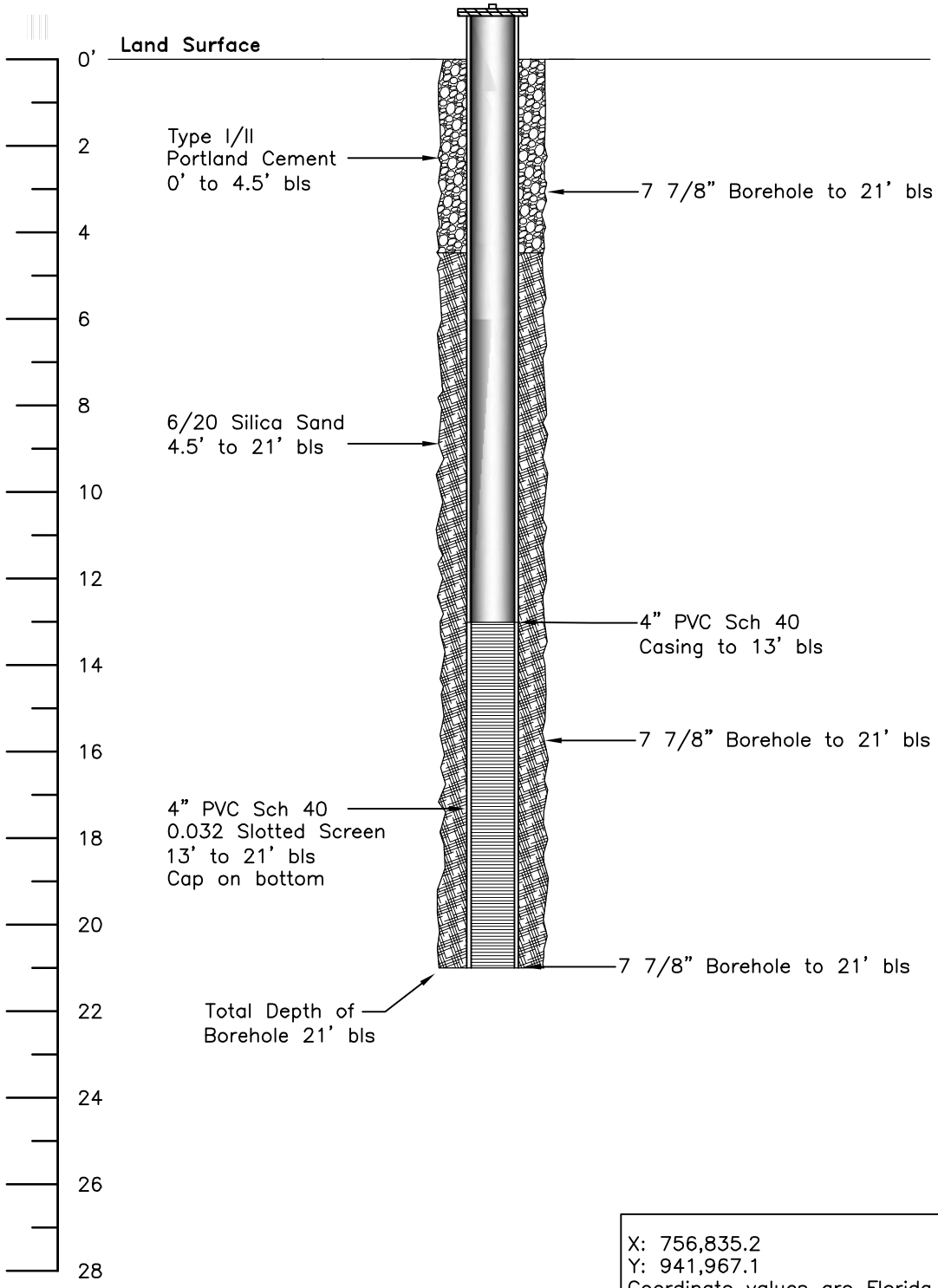
Q:\2011\20118669-001\WaterMgmt\Well Details.dwg (Well JE-1501) mll2 Oct 13, 2011 - 2:54pm

JOHNSON ENGINEERING

2122 JOHNSON STREET
P.O. BOX 1550
FORT MYERS, FLORIDA 33902-1550
PHONE (239) 334-0046
FAX (239) 334-3661
E.B. #642 & L.B. #642

JE-1501 Well Construction Details

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
10/11/11	20118669-001	00-00-00	As Shown	1 Of 1



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JOHNSON ENGINEERING

2122 JOHNSON STREET
P.O. BOX 1550
FORT MYERS, FLORIDA 33902-1550
PHONE (239) 334-0046
FAX (239) 334-3661
E.B. #642 & L.B. #642

JE-1502 Well Construction Details

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
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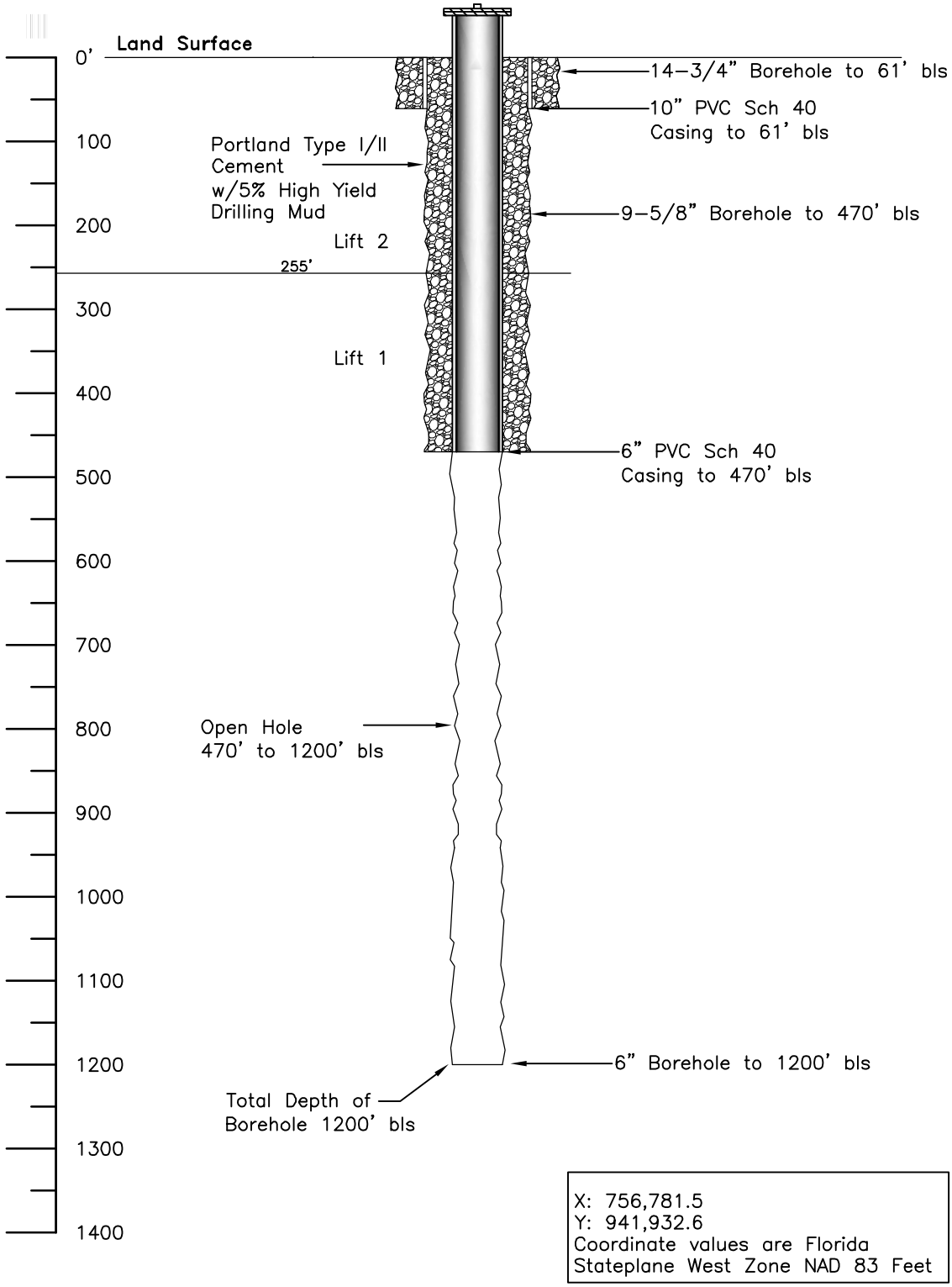

Q:\2011\20118669-001\WaterMgmt\Well Details.dwg (Well JE-1503) mll2 Oct 13, 2011 - 2:56pm

JOHNSON ENGINEERING

2122 JOHNSON STREET
P.O. BOX 1550
FORT MYERS, FLORIDA 33902-1550
PHONE (239) 334-0046
FAX (239) 334-3661
E.B. #642 & L.B. #642

JE-1503 Well Construction Details

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
10/11/11	20118669-001	00-00-00	As Shown	1 Of 1

Collection of drill cutting samples during pilot hole of JE-1503.

Limestone cuttings removed from drilling mud by orbital shaker.

View of drilling site looking southeast.

Breaking a connection.

Making a connection.

Final casing run for JE-1503.

Second stage cement lift on final casing for JE-1503.

Reverse-air drilling.

Air-lift pumping well development.

Dual Induction logging tool setup.

Bailer sample retrieval.

X-Y Caliper & Gamma logging tool.

Flow logging tool.

Appendix F

Upper Floridan Aquifer Test Well JE-1503

Depth (feet bls)	Lithology
0-13	SILT with clay, some organic matter and fine sand, sub-angular, light grey (2.5Y 7/2).
13-30	SHELL with clay. White bivalve shell, up to 1 to 2-inch fragments, some moderately indurated silt stone below 20 feet bls, dark grey (2.5Y 4/1).
30-60	CLAY with silt, moderately stiff, some shell up to 2-inchesand fine-grained limestone, shell casts, dark grey (2.5Y 4/1) to black (2.5Y 2.5/1). Shell decreasing below 50 feet bls.
60-65	LIMESTONE, fine grained, some shell and shell casts, good porosity, light grey (2.5Y 7/1).
65-70	CLAY with silt, some shell, light grey (2.5Y 7/1).
70-100	SILT with clay, some to trace white limestone and shell, light grey (2.5Y 7/1) to white (2.5Y 8/1).
100-160	CLAY with silt, some to trace limestone and shell fragments, light yellowish brown (2.5Y 6/3) to dark greyish brown (2.5Y 4/2) to dark grey (2.5Y 4/1). With white silty clay below 130 feet bls.
160-180	SILT with clay, white nodules of clay, some to trace limestone, light brownish grey (2.5Y 6/2).
180-230	CLAY with silt, white, trace limestone and shell, shell casts, phosphatic sand. Limestone increasing with depth and phosphate becoming coarser. Light grey (2.5Y 7/2) below 210 feet bls.
230-240	SILT with clay, some limestone and shell fragments, light brownish grey (2.5Y 6/2).
240-280	CLAY with silt, soft, trace limestone and phosphate, olive grey (2.5Y 5/2).
280-330	CLAY with silt as above, white (2.5Y 8/1) to light grey (2.5Y 7/2), trace phosphate and white, fine-grained limestone.
330-340	CLAY with silt, some shell and limestone fragments, pale yellow (2.5Y 7/4).
340-420	SILT with clay, limestone and shell fragments, limestone fine-grained with shell casts, trace phosphate, light grey (2.5Y 7/1). Clay increasing below 360 feet bls and shell and limestone decreasing.
420-460	CLAY with silt, some limestone, light grey (5Y 7/2).

460-490	LIMESTONE, fine-grained, very poorly indurated, moldic porosity, with silty clay, some shell, trace phosphate, white (5Y 8/1).
490-500	CLAY with silt, some shell fragments up to 1-inch and limestone, light grey (5Y 7/1).
500-530	SILT with clay, shell and limestone fragments, white to light grey (5Y 7/1). Limestone fine-grained and poorly to moderately indurated with shell casts. Clay increasing below 520 feet bls, shell and limestone decreasing.
530-600	CLAY with silt, soft, some to trace small limestone and shell fragments, limestone fine-grained and moderately indurated, trace coarse phosphate, light grey (5Y 7/1) to white.
600-610	CLAY with silt, as above, grey (5Y 6/1), phosphatic.
610-620	LIMESTONE, sandy, fine-grained, poorly indurated, trace phosphate, light grey (5Y 7/2) to grey (5Y 6/1) with clayey sand.
620-650	SAND with clay, white, soft and sticky, with Interbedded limestone layers, as above, trace phosphate. Clay becoming siltier with depth and limestone decreasing. Drilling notes indicate harder/firmer material from 625 to 636 and 640-660 feet bls.
650-660	Sandy LIMESTONE to SANDSTONE, fine-grained, poorly indurated, trace phosphate, pale yellow (5Y 8/2).
660-670	LIMESTONE, fine-grained, poorly indurated, with shell, white to pale yellow.
670-690	CLAY with silt, some limestone, as above, light grey (5Y 7/2) to white.
690-710	LIMESTONE, white, fine-grained, poorly indurated with clay, as above, some shell, trace phosphate.
710-760	LIMESTONE, as above, poorly to moderately indurated, some secondary porosity, with shell, some silt below 720 feet bls, turning light grey (5Y 7/1) below 750 feet bls.
760-780	LIMESTONE, as above, sandy, poorly indurated, some porosity.
780-790	CLAY with silt and limestone, as above, pale yellow (2.5Y 8/2).
790-800	LIMESTONE, as from 710-760 feet bls, not sandy, poorly indurated, white.
800-840	LIMESTONE, as above, some silt, light grey (2.5Y 7/2).
840-900	LIMESTONE, as above, sandy, poorly indurated, fine-grained, some shell and shell casts, pale yellow (2.5Y 8/2).

900-930	LIMESTONE, as above, secondary and moldic porosity, some shell.
930-970	LIMESTONE, as above, little porosity and shell.
970-980	LIMESTONE, as above, with shell.
980-1045	Platy LIMESTONE fragments, finely laminated, possibly becoming dolomitized, with fine-grained, poorly indurated limestone, as above.
1045-1050	CLAY with silt, some shell and limestone, as above, light grey (5Y 7/2).
1050-1100	Platy LIMESTONE fragments, as from 980-1,045 feet bls, some limestone with large crystals. Limestone increasing below 1,090 feet bls.
1100-1150	LIMESTONE, silty, fine-grained, poorly indurated, chalky texture, pale yellow (5Y 8/2) to light grey (5Y 7/2). Trace to some shell below 1,120 feet bls, secondary porosity from 1,140 to 1,150 feet bls.
1150-1180	LIMESTONE, silty to sandy, fine-grained, moderately indurated, some to trace shell, small visible crystals, pale yellow (5Y 7/3). Some shell embedded in silty lime matrix below 1,160 feet bls.
1180-1185	As above, with grey (5Y 5/1) lime mud with embedded sand and limestone fragments, some shell molds.
1185-1190	LIMESTONE, silty, fine-grained, poorly indurated, some secondary porosity, light grey (5Y 7/2), some shell, trace visible calcite crystals.
1190-1200	LIMESTONE, as from 1,100-1,150 feet bls, pale yellow (5Y 8/2), some secondary porosity, some shell and grey, fine-grained limestone, trace phosphatic sandstone.

Water Table Aquifer Test Well JE-1502

Depth (feet bls)	**Lithology**
0-13	SILT with clay, some organic matter and fine sand, sub-angular, light grey (2.5Y 7/2).
13-21	SHELL with clay. White bivalve shell, up to 1 to 2-inch fragments, some moderately indurated silt stone below 20 feet bls, dark grey (2.5Y 4/1).

Intermediate Aquifer Test Well JE-1501

Depth (feet bls)	Lithology
0-13	SILT with clay, some organic matter and fine sand, sub-angular, light grey (2.5Y 7/2).
13-30	SHELL with clay. White bivalve shell, up to 1 to 2-inch fragments, some moderately indurated silt stone below 20 feet bls, dark grey (2.5Y 4/1).
30-60	CLAY with silt, moderately stiff, some shell up to 2-inchesand fine-grained limestone, shell casts, dark grey (2.5Y 4/1) to black (2.5Y 2.5/1). Shell decreasing below 50 feet bls.
60-65	LIMESTONE, fine grained, some shell and shell casts, good porosity, light grey (2.5Y 7/1).
65-70	CLAY with silt, some shell, light grey (2.5Y 7/1).
70-100	SILT with clay, some to trace white limestone and shell, light grey (2.5Y 7/1) to white (2.5Y 8/1).
100-160	CLAY with silt, some to trace limestone and shell fragments, light yellowish brown (2.5Y 6/3) to dark greyish brown (2.5Y 4/2) to dark grey (2.5Y 4/1). With white silty clay below 130 feet bls.
160-180	SILT with clay, white nodules of clay, some to trace limestone, light brownish grey (2.5Y 6/2).
180-230	CLAY with silt, white, trace limestone and shell, shell casts, phosphatic sand. Limestone increasing with depth and phosphate becoming coarser. Light grey (2.5Y 7/2) below 210 feet bls.
230-240	SILT with clay, some limestone and shell fragments, light brownish grey (2.5Y 6/2).

Appendix G

MV Geophysical

X-Y CALIPER GAMMA RAY LOG

Company	Johnson Engineering, Inc.
Well	JE1503
Field	Babcock Ranch
County	Charlotte
State/Prv	Florida

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte State/Prv . Florida

Location
CCU/Babcock Ranch Test Well Project
Sec. 11 T41S R26E
LAT: 26 55' 29.6" N LONG: 81 41' 28.7" W

Other Services: XY/GR, DIL/SP

		Elevation	Elevation
Permanent Datum	G.L.		K.B.
Log Measured From	G.L.		D.F.
Drilling Measured From	G.L.		G.L.

Date	16-MAY-2011		
Run Number	ONE		
Depth Driller	470'		
Depth Logger	467'		
Bottom Logged Interval	467'		
Top Log Interval	SURFACE		
Open Hole Size	9.625"		
Type Fluid	MUD		
Density / Viscosity	NA/NA		
Max. Recorded Temp.	NA		
Estimated Cement Top	SURFACE		
Time Well Ready	13:15 5/16/2011		
Time Logger on Bottom	13:30 5/16/2011		
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller/C.Miller		
Witnessed By	L.Howard (JE)	T.Denison (JE)	

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9.625"	61'	470'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	10" ID	SURFACE	61'
Prot. String				
Production String				
Liner				
Invoice No.	2011060	3x/10x/pdf/las	je1503.db	* FINAL PRINT *

<<< Fold Here >>>

Comments

MAXIMUM Caliper Arm Extensions: 33"

MAIN PASS

MV Geophysical

MAIN PASS

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Presentation Format: XY515-21
Dataset Creation: Mon May 16 15:40:27 2011
Charted by: Depth in Feet scaled 1:1200

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		5 X-CALIPER (in) 15
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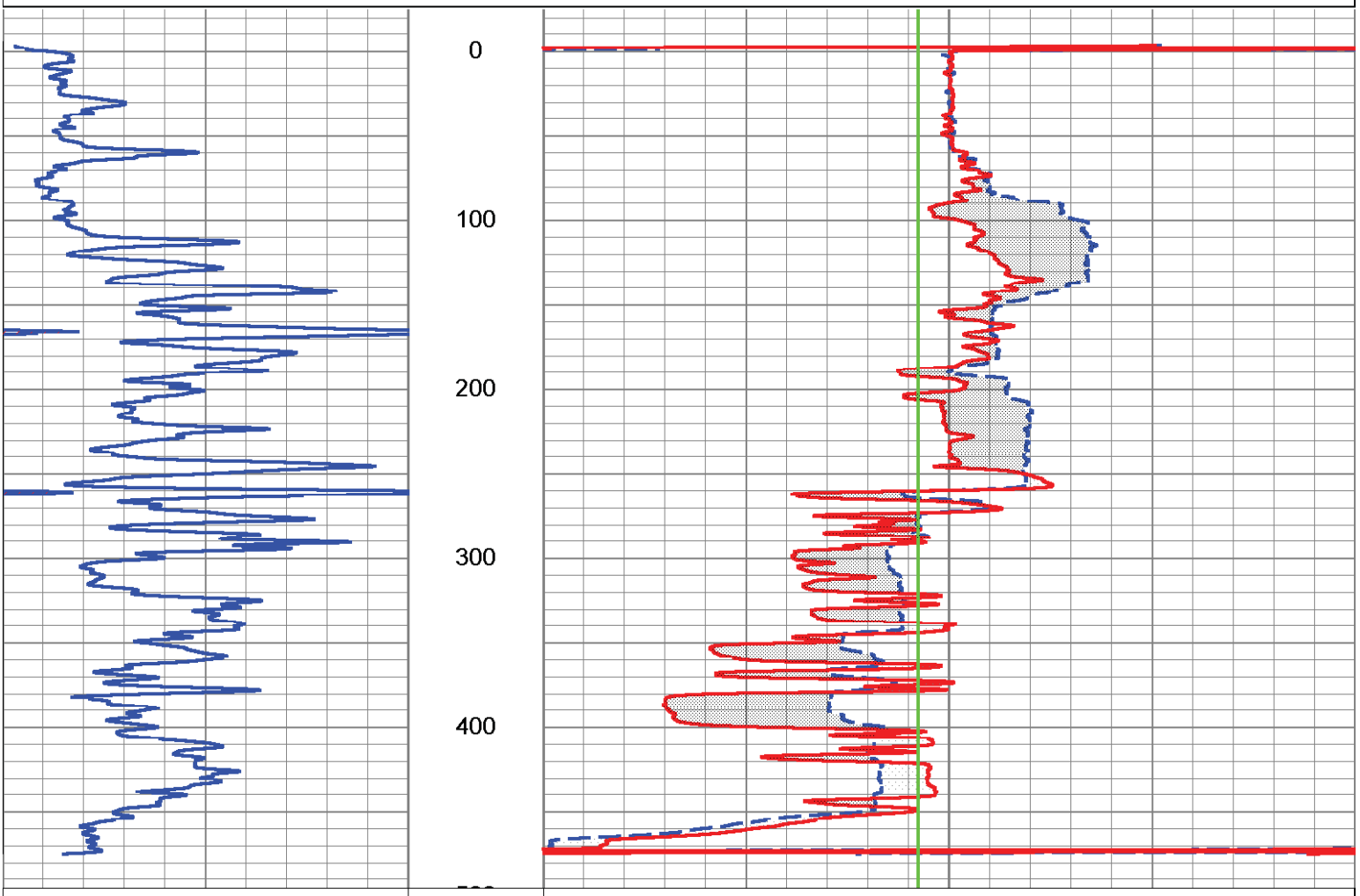

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MV Geophysical

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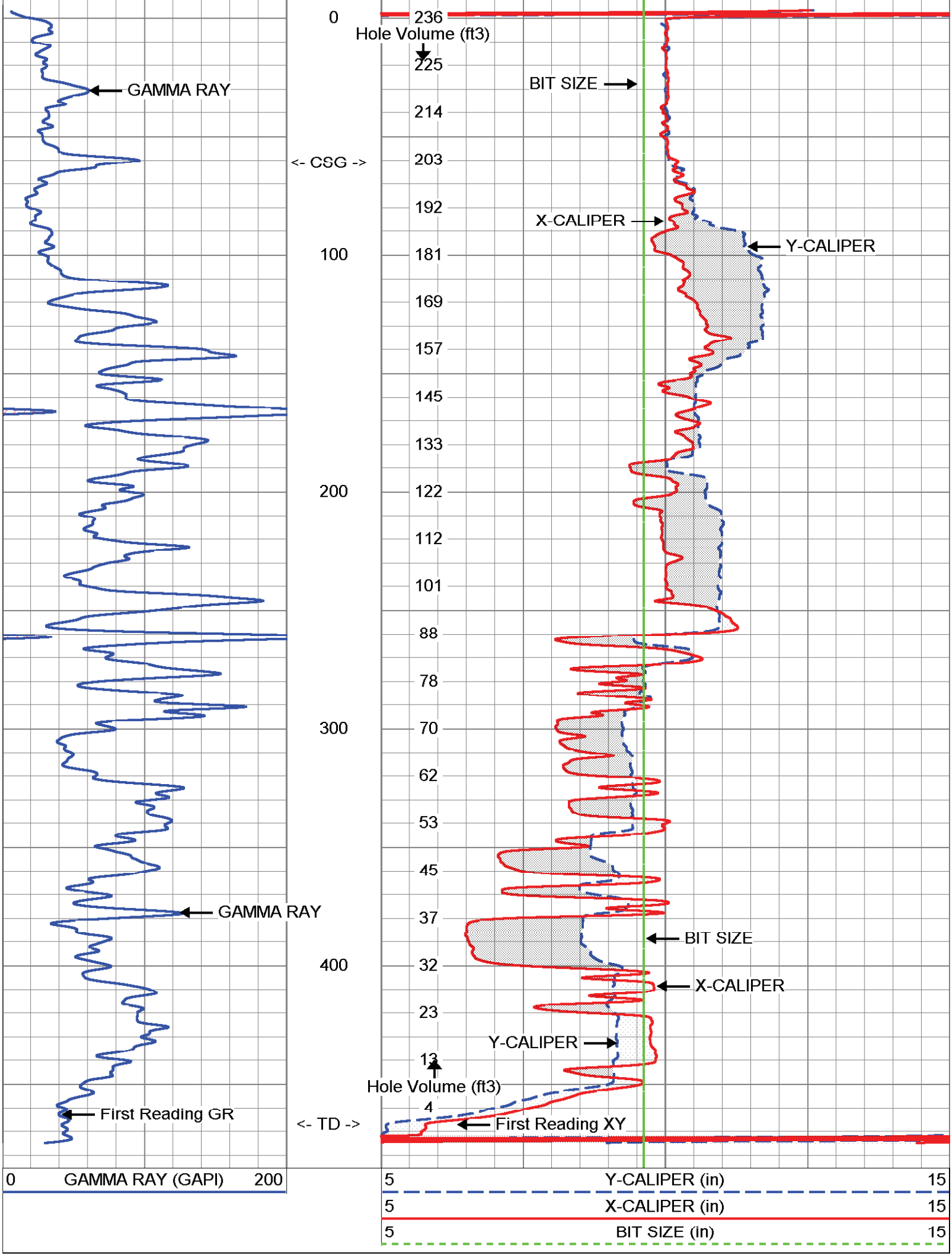
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GAMMA RAY
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Hole Volume (ft3)
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BIT SIZE
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Y-CALIPER
BIT SIZE
X-CALIPER
Y-CALIPER
Hole Volume (ft3)
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5 BIT SIZE (in) 15

MV Geophysical

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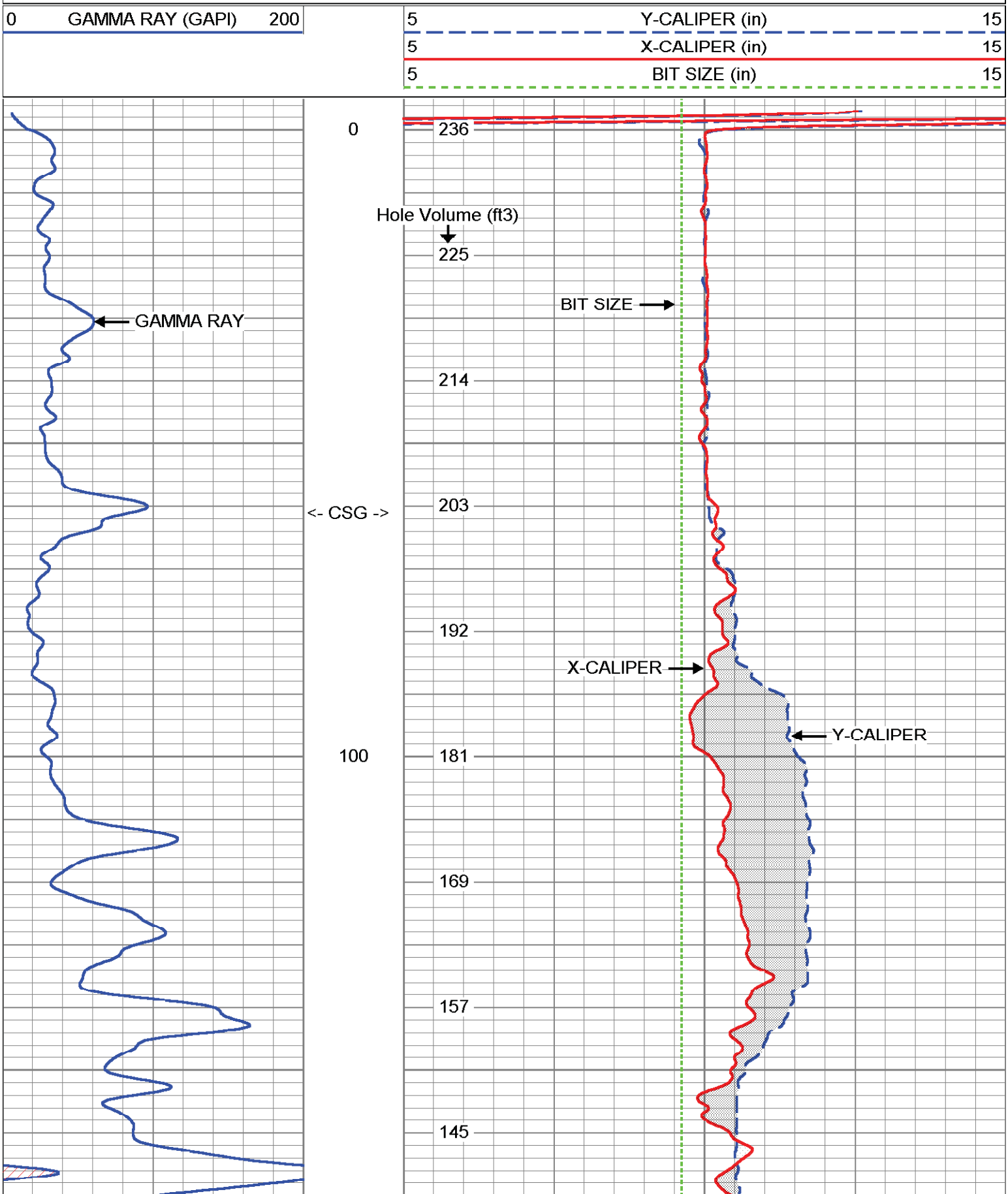

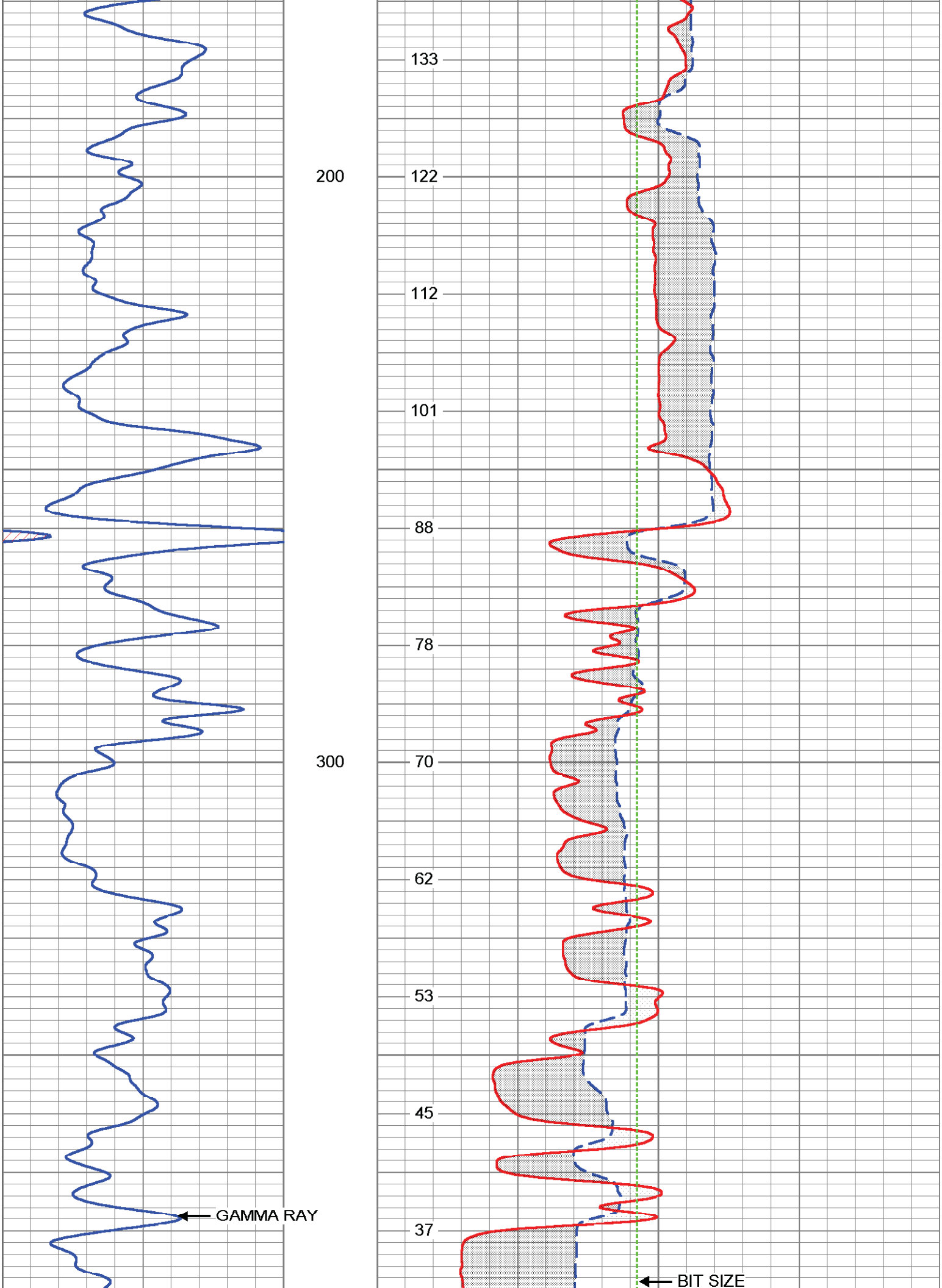
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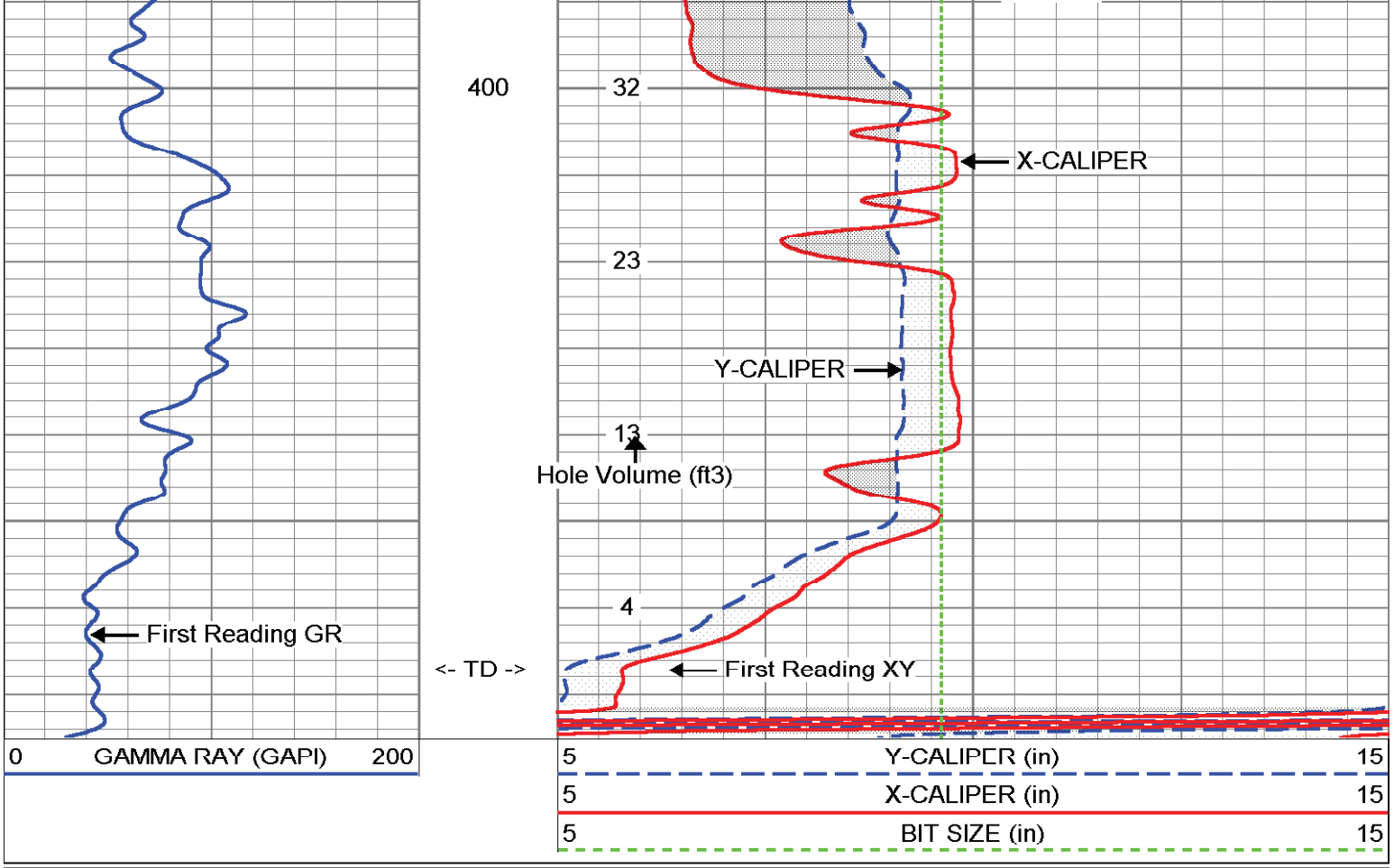

MV Geophysical

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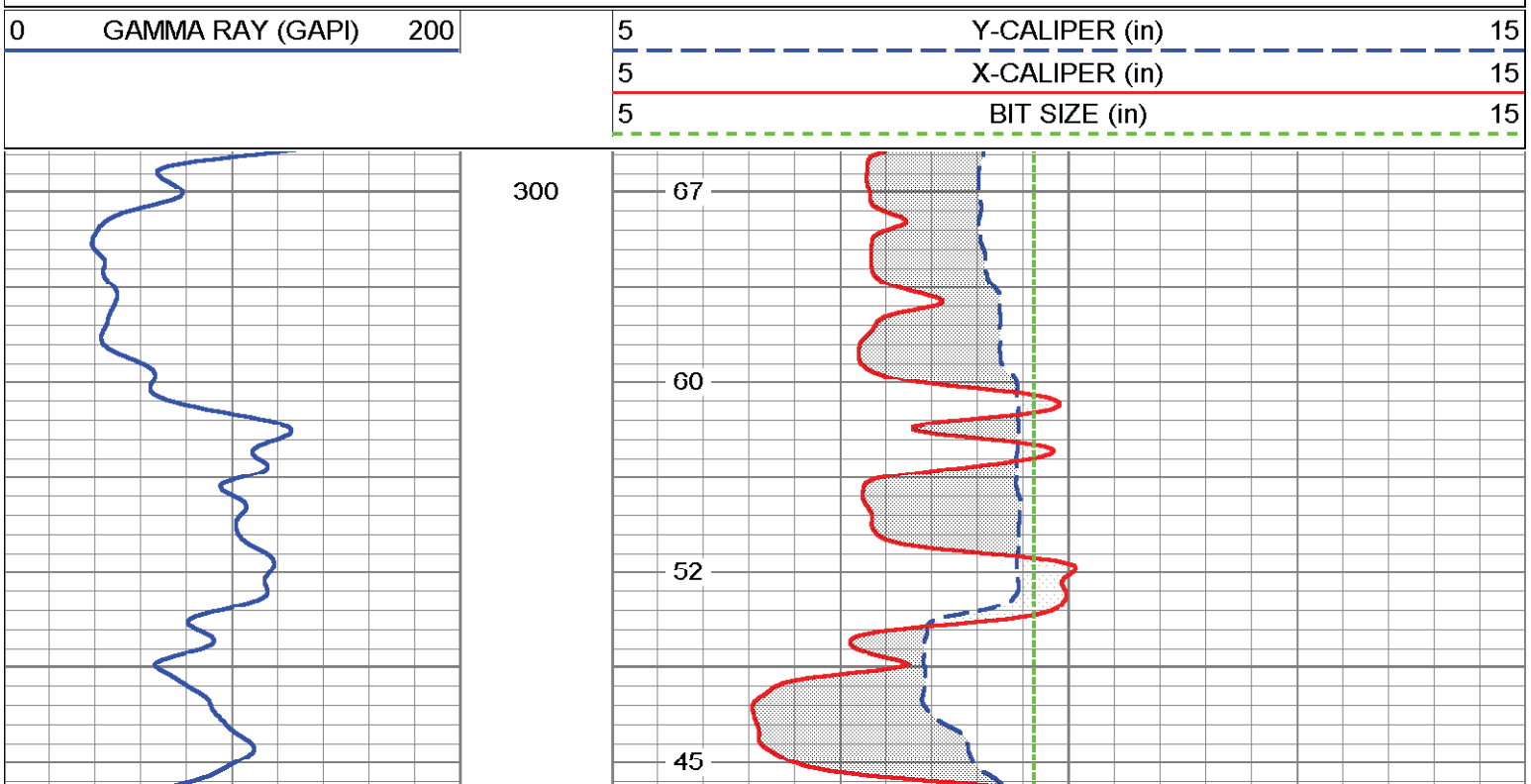
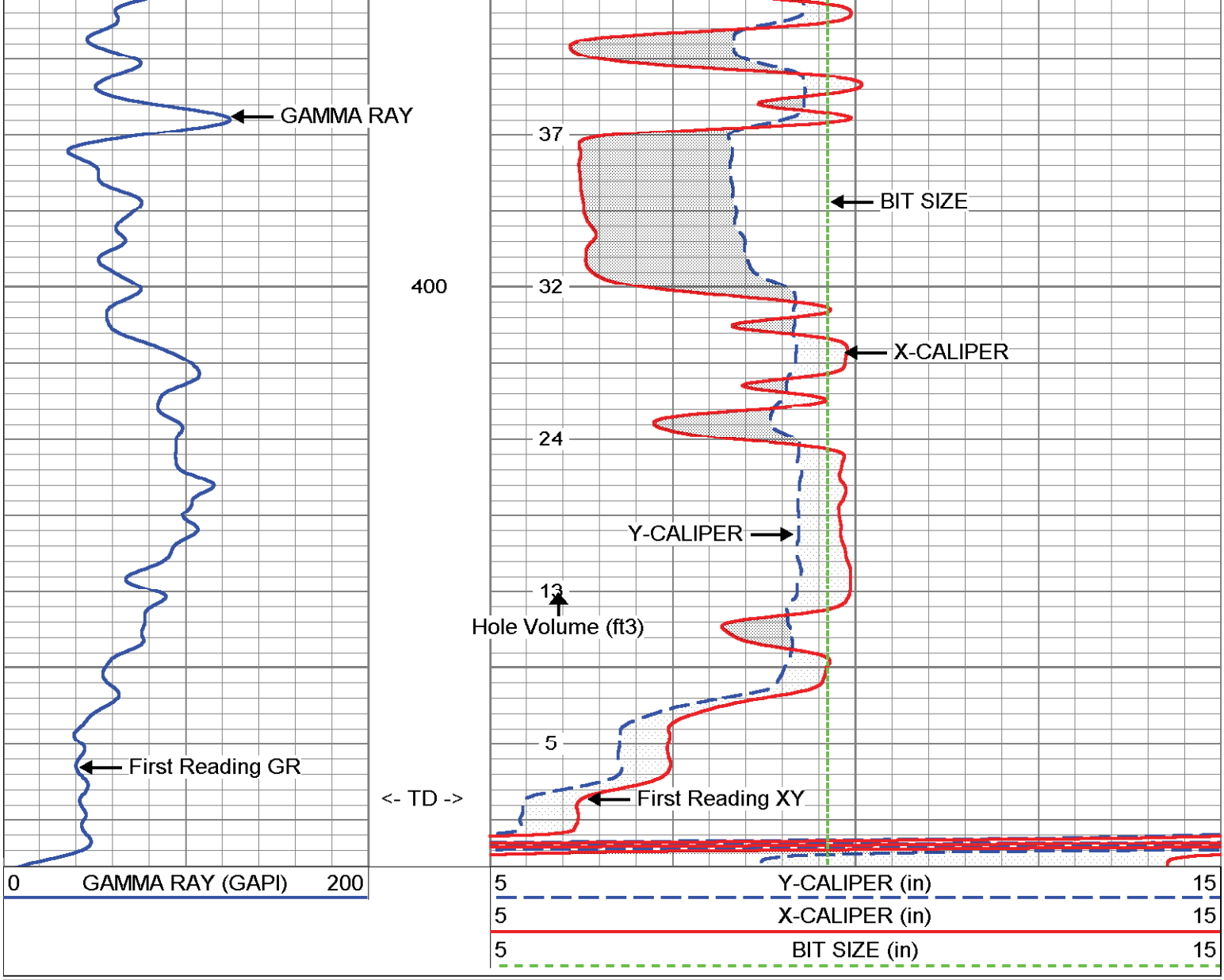
Charted by: Depth in Feet scaled 1:240



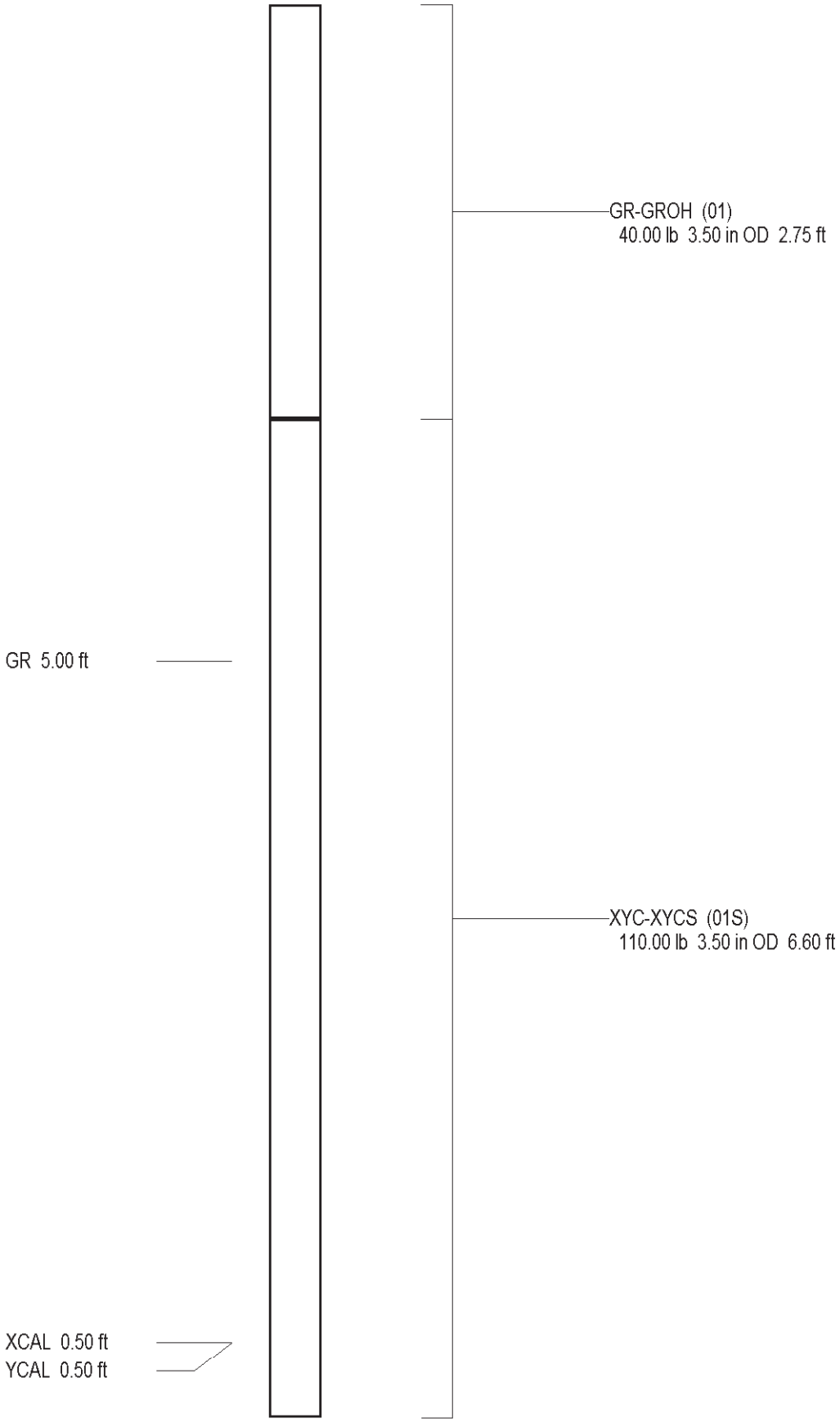


XY Caliper Calibration Report

Serial Number:	01S		
Tool Model:	XYCS		
Performed:	Mon May 16 13:57:45 2011		
Small Ring:	10	in	
Large Ring:	33	in	
	X Caliper	Y Caliper	
Reading with Small Ring:	689.5	690.2	cps
Reading with Large Ring:	1133.3	1074.5	cps
Gain:	0.0518251	0.0598491	
Offset:	-25.7334	-31.3078	

Gamma Ray Calibration Report

Serial Number:	01	
Tool Model:	GROH	
Performed:	Sun May 15 10:47:49 2011	
Calibrator Value:	120	GAPI
Background Reading:	13.487	cps
Calibrator Reading:	130.517	cps
Sensitivity:	1.02538	GAPI/cps



Dataset:	run1/pass2
Total Length:	9.35 ft
Total Weight:	150.00 lb
O.D.	3.50 in

MV Geophysical

DUAL INDUCTION LL3 / SP LOG

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte
State/Prv Florida

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte State/Prv . Florida

Location
CCU/Babcock Ranch Test Well Project
Sec. 11 T41S R26E
LAT: 26 55' 29.6" N LONG: 81 41' 28.7" W

Other Services
XY/GR
DIL/SP

Permanent Datum	G.L.	Elevation
Log Measured From	G.L.	
Drilling Measured From	G.L.	

Elevation
K.B.
D.F.
G.L.

Date	16-MAY-2011		
Run Number	ONE		
Depth Driller	470'		
Depth Logger	467'		
Bottom Logged Interval	465'		
Top Log Interval	61'		
Open Hole Size	9.625"		
Type Fluid	MUD		
Density / Viscosity	NA/NA		
Max. Recorded Temp.	NA		
Estimated Cement Top	SURFACE		
Time Well Ready	13:15 5/16/2011		
Time Logger on Bottom	14:30 5/16/2011		
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller/C.Miller		
Witnessed By	L.Howard (JE)	T.Denison (JE)	

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9.625"	61'	470'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	10" ID	SURFACE	61'
Prot. String				
Production String				
Liner				
Invoice No.	2011060	3x/10x/pdf/las	je1503.db	* F NAL PRINT *

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

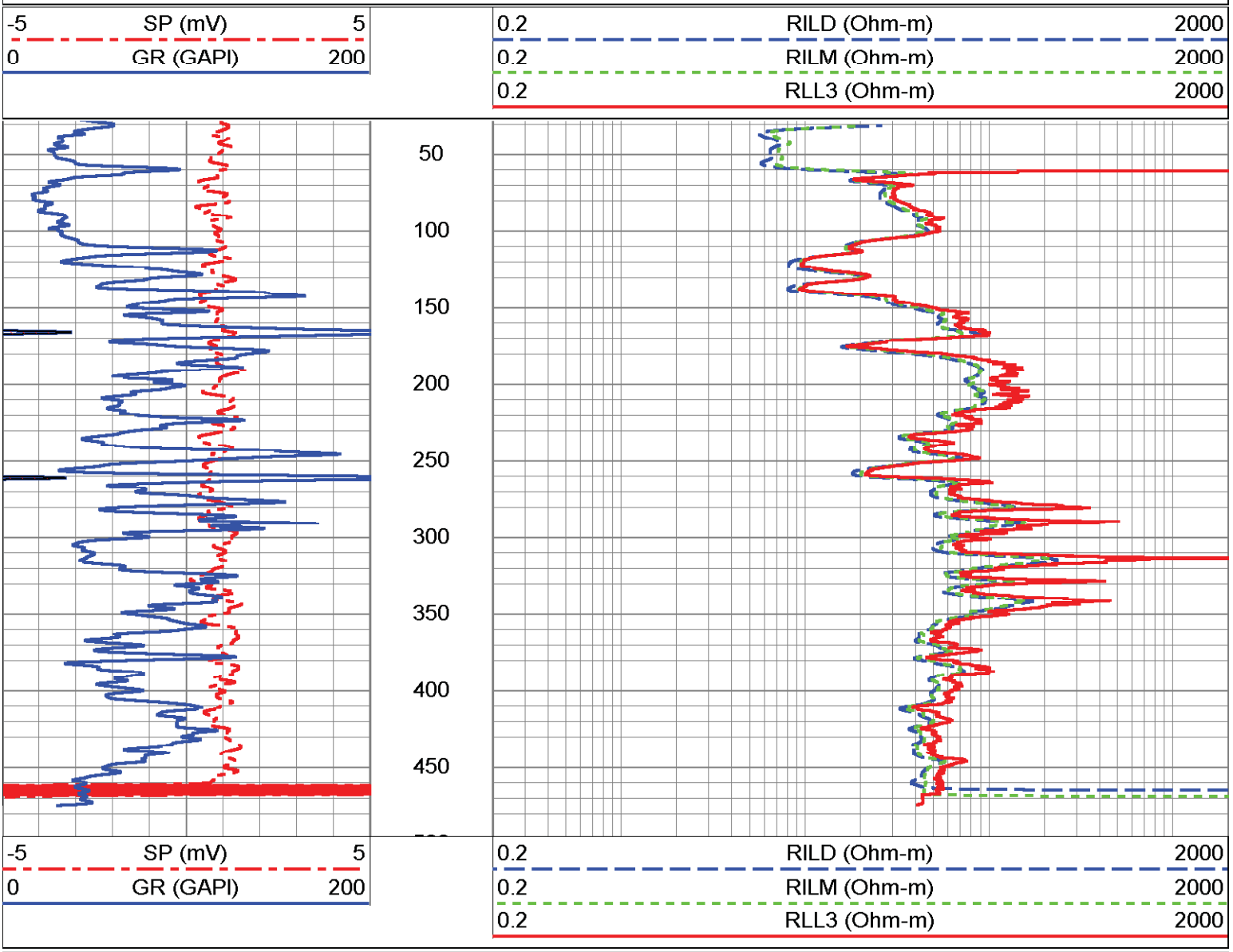
Comments

Rm=5.254 ohm-m @ 75.0 degF

MV Geophysical

MAIN PASS

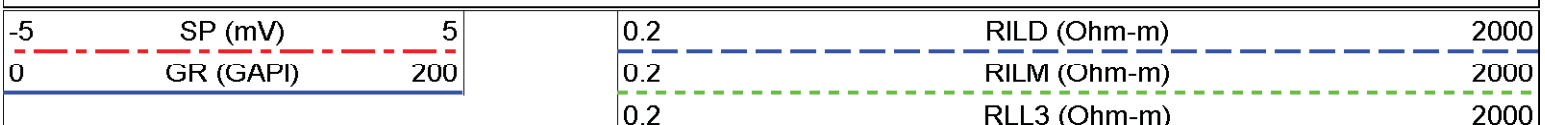
Database File: je1503.db
Dataset Pathname: MAIN
Presentation Format: DIL1200
Dataset Creation: Mon May 16 15:40:27 2011
Charted by: Depth in Feet scaled 1:1200

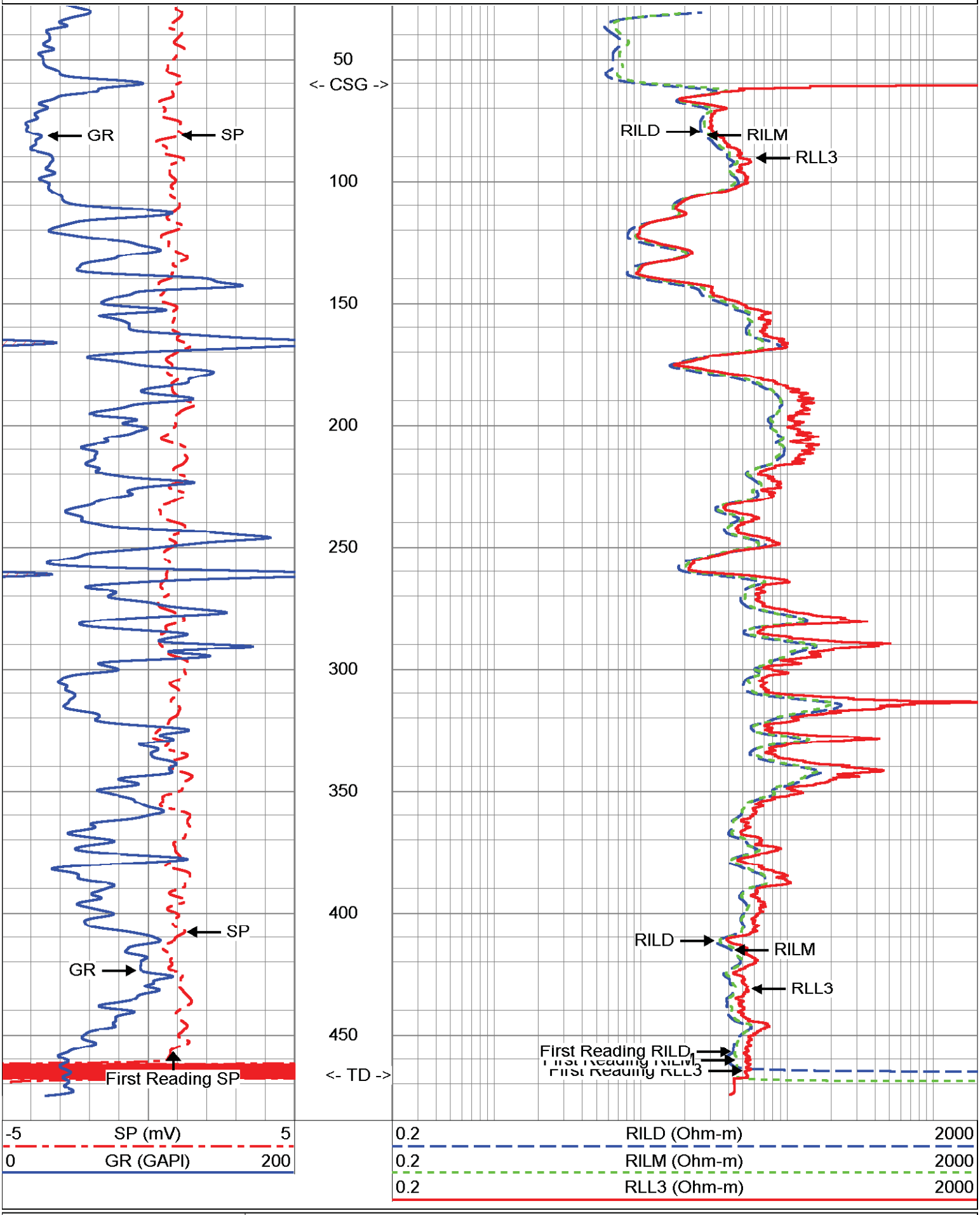


MV Geophysical

MAIN PASS

Database File: je1503.db
Dataset Pathname: MAIN
Presentation Format: DIL200
Dataset Creation: Mon May 16 15:40:27 2011
Charted by: Depth in Feet scaled 1:600

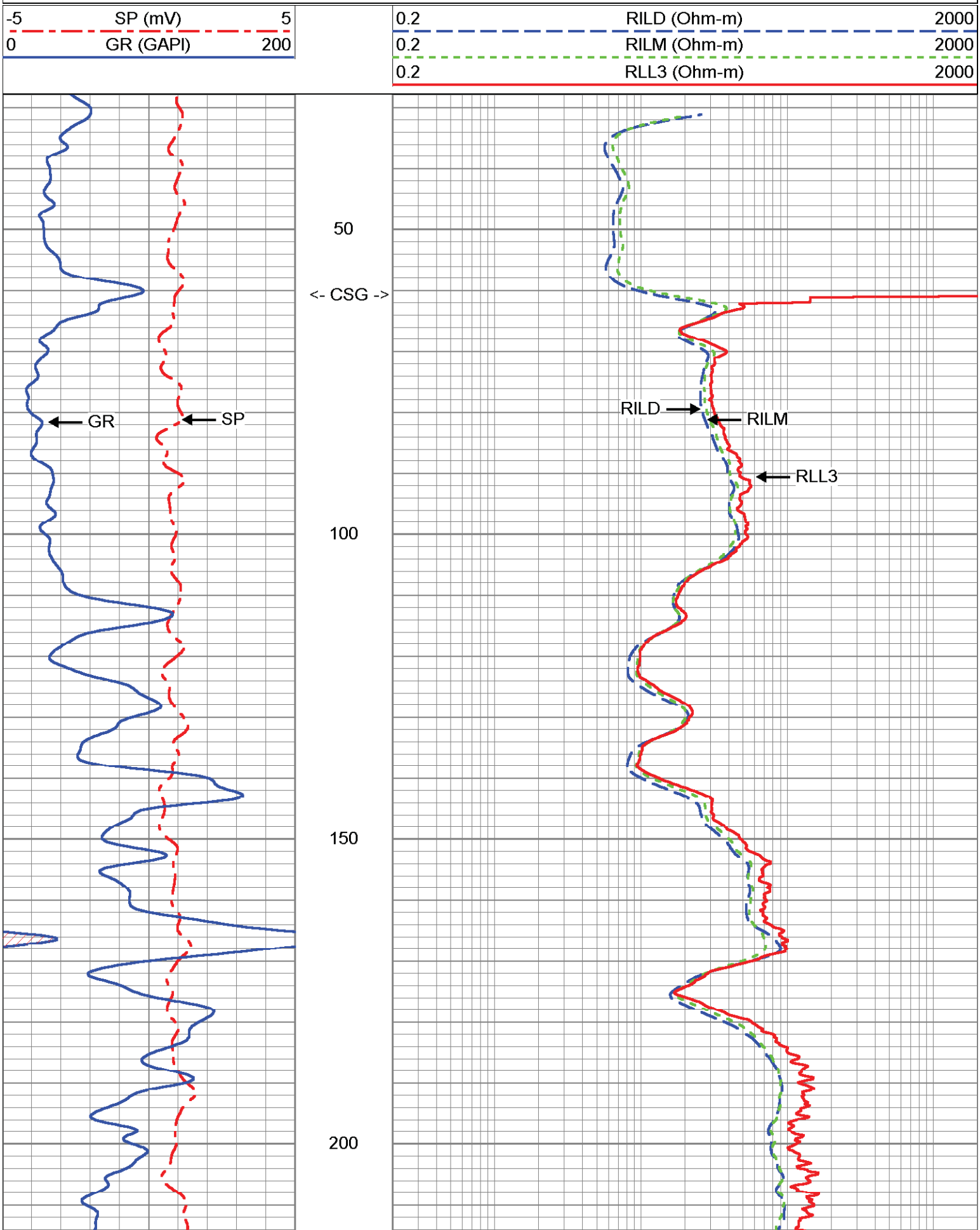


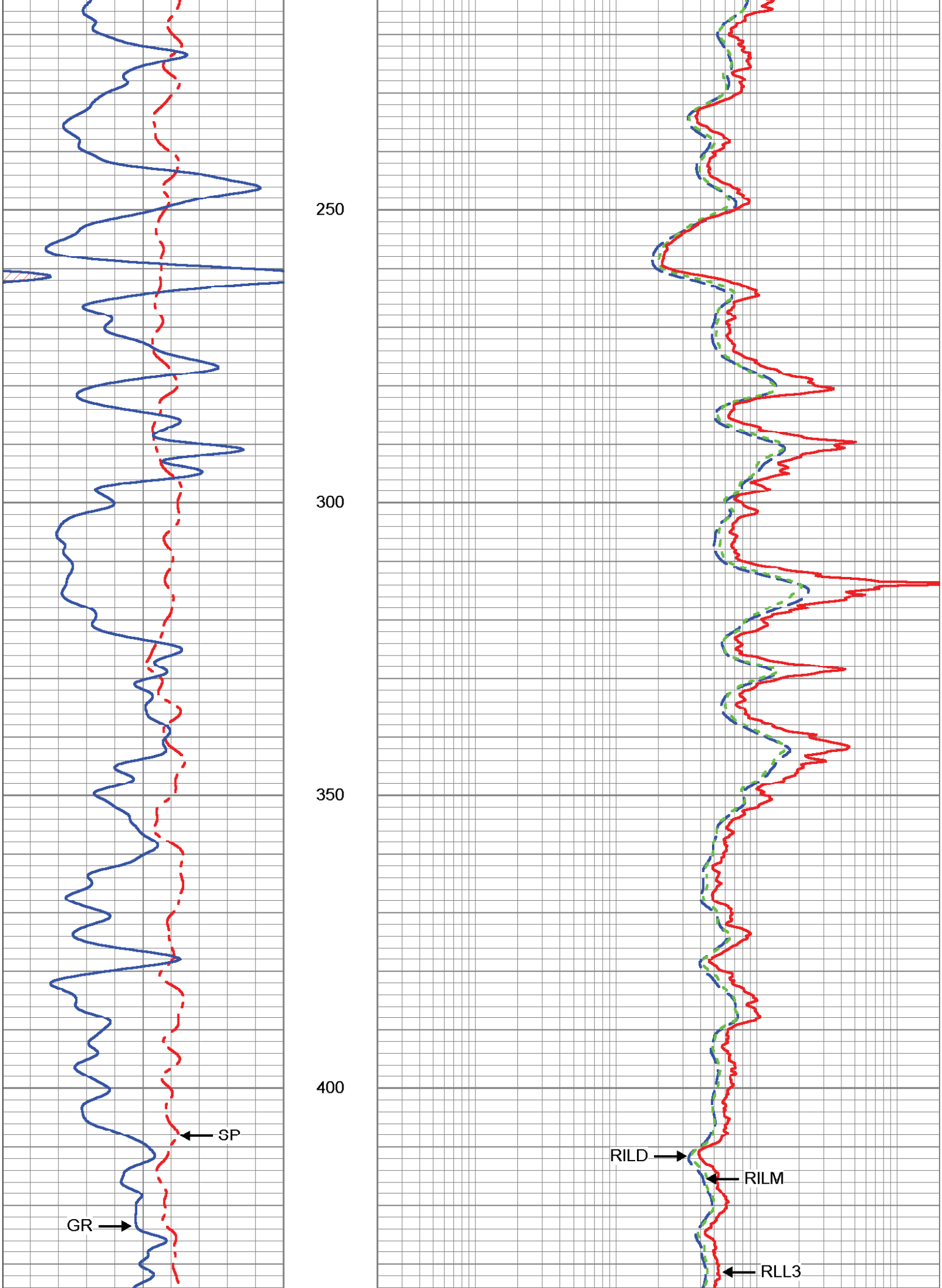


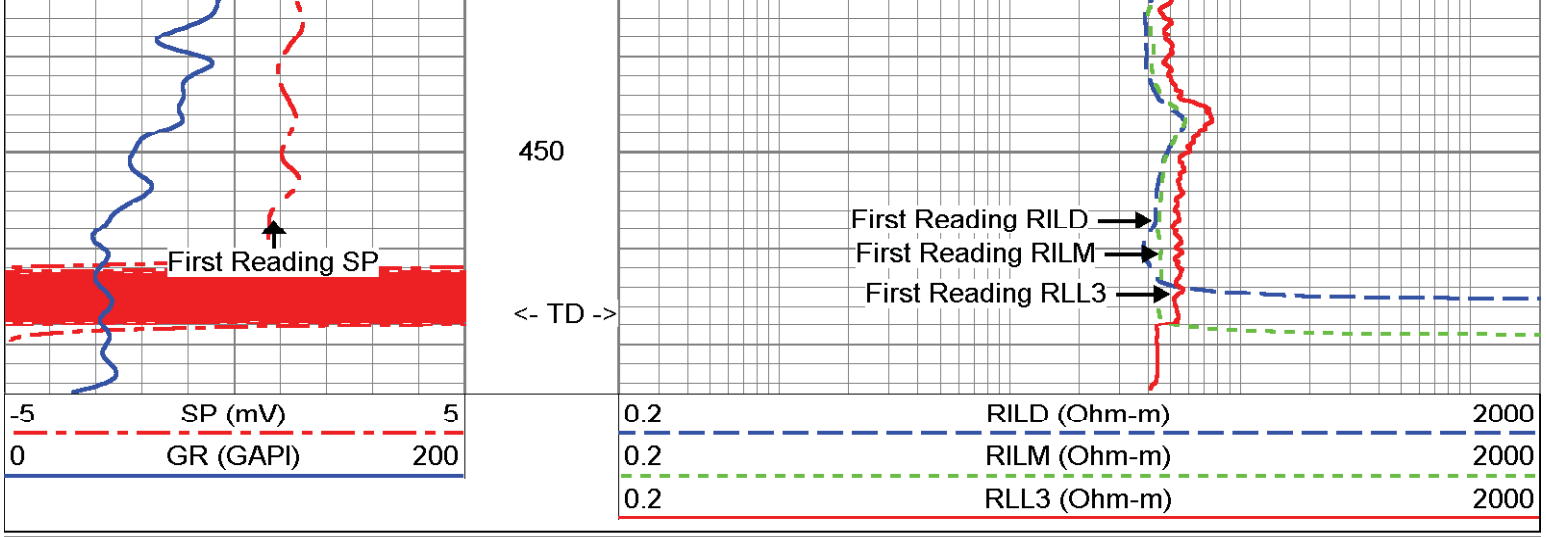
MV Geophysical

MAIN PASS

Database File:	je1503.db
Dataset Pathname:	MAIN
Presentation Format:	DIL200
Dataset Creation:	Mon May 16 15:40:27 2011
Charted by:	Depth in Feet scaled 1:240



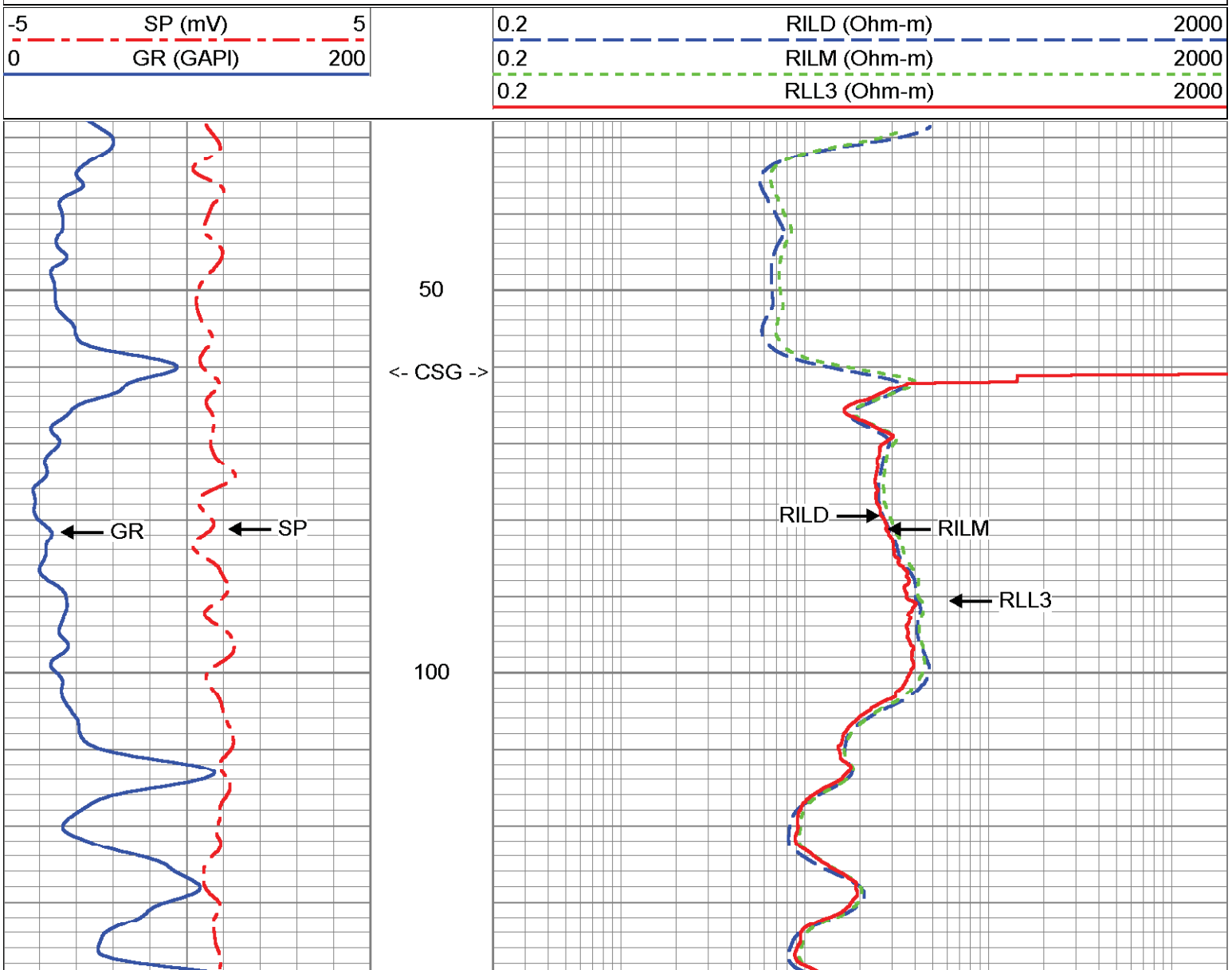

250
300
350
400
SP
GR
RILD
RILM
RLL3

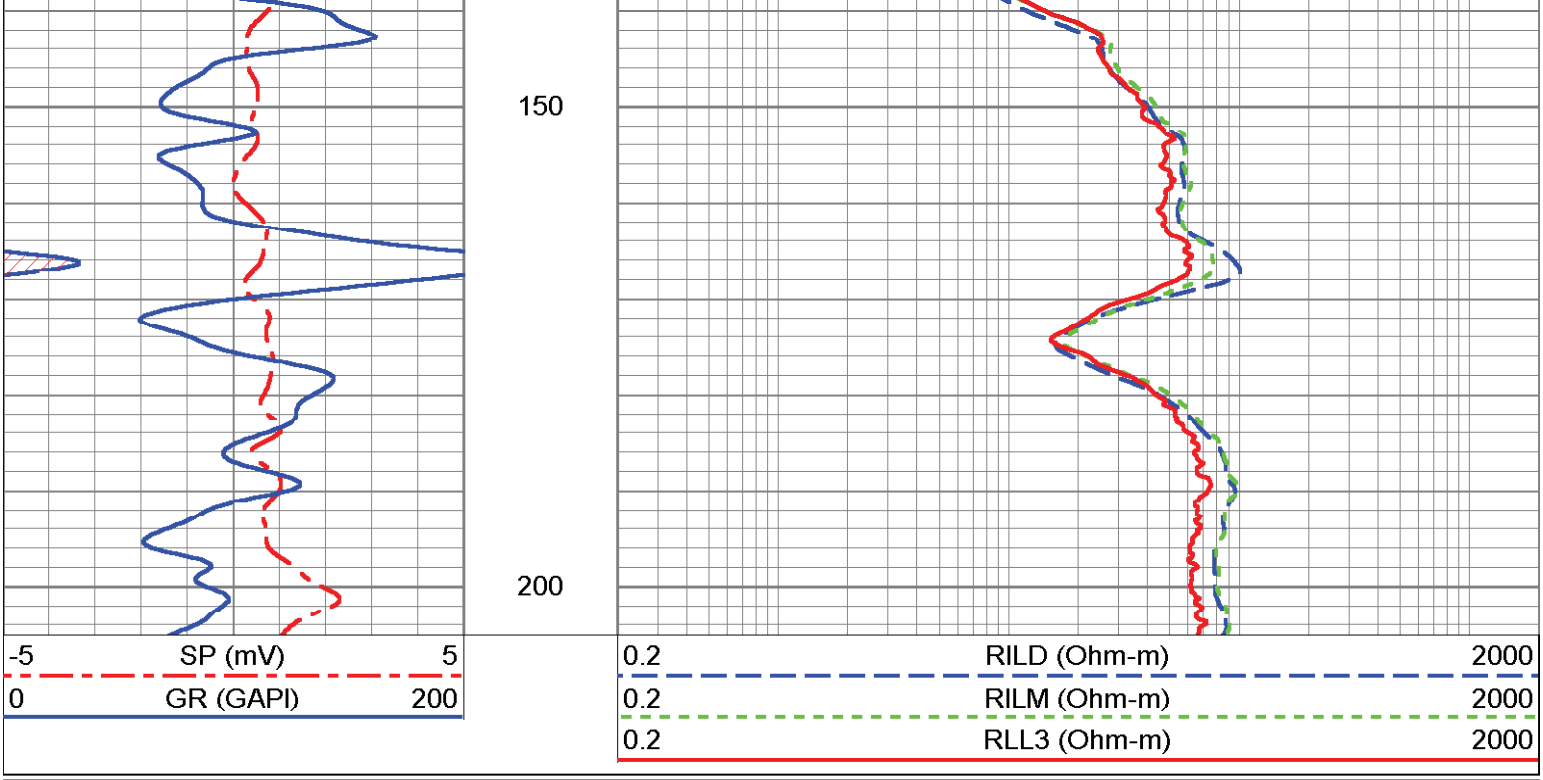


MV Geophysical

REPEAT SECTION

Database File: je1503.db
Dataset Pathname: REPEAT
Presentation Format: DIL200
Dataset Creation: Mon May 16 14:44:25 2011
Charted by: Depth in Feet scaled 1:240





Dual Induction Calibration Report

Serial-Model:	5390-R
Surface Cal Performed:	Wed Apr 21 11:17:23 2010
Downhole Cal Performed:	Wed Apr 21 11:04:55 2010
After Survey Verification Performed:	Wed Apr 21 11:04:55 2010

Surface Calibration

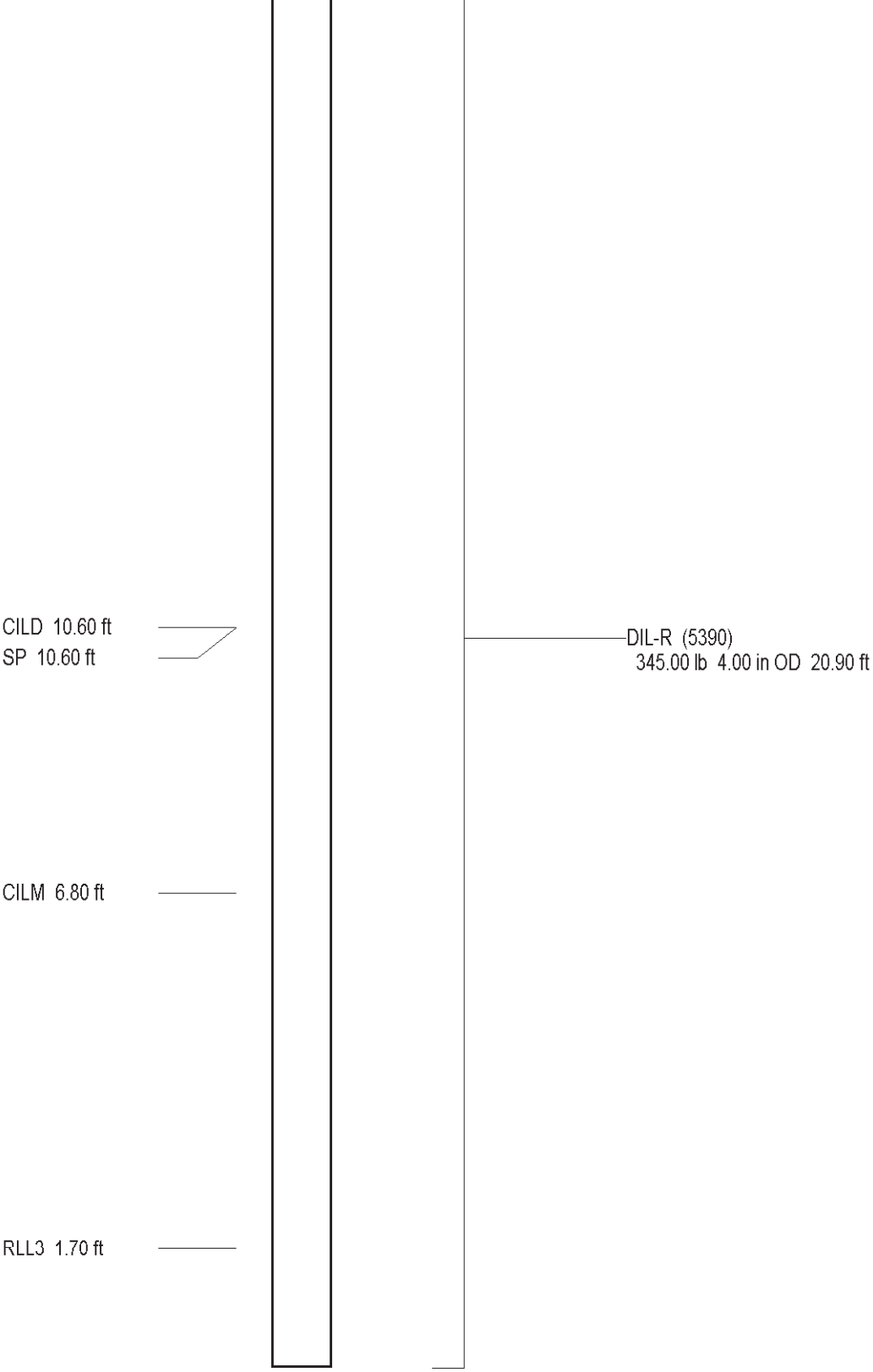
	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.050	0.645	V	0.000	400.000	mmho-m	672.269	-33.613
Medium	0.018	0.735	V	0.000	464.000	mmho-m	647.120	-11.545
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.011	0.641	V	0.000	400.000	mmho-m	634.921	-6.984
Medium	0.005	0.739	V	0.000	464.000	mmho-m	632.408	-3.370

Downhole Calibration

	Readings			References			Results	
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	-43.158	78.288	mmho-m	-42.562	77.982	mmho-m	0.993	0.275
Medium	-9.475	466.701	mmho-m	-8.097	466.698	mmho-m	0.997	1.351
Shallow	2.516	0.025	V	494.500	2.000	Ohm-m	197.710	-2.980

After Survey Verification

	Readings			Targets			Results	
Internal:	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho-m	-43.158	78.288	mmho-m	0.993	0.275
Medium	0.000	0.000	mmho-m	-9.475	466.701	mmho-m	0.997	1.351
Shallow	0.000	0.000	Ohm-m	494.500	2.000	Ohm-m	1.000	0.000



Dataset:	run1/pass7
Total Length:	20.90 ft
Total Weight:	345.00 lb
O.D.	4.00 in

MV Geophysical

X-Y CALIPER GAMMA RAY LOG

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte
State/Prv Florida

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte State/Prv . Florida

Location
CCU/Babcock Ranch Test Well Project
Sec. 11 T41S R26E
LAT: 26 55' 29.6" N LONG: 81 41' 28.7" W

Other Services
XY/GR,DIL
FCT,FLOW
F.Samples

		Elevation
Permanent Datum	G.L.	Elevation
Log Measured From	G.L.	
Drilling Measured From	G.L.	

Elevation
K.B.
D.F.
G.L.

Date	6-JUN-2011		
Run Number	TWO		
Depth Driller	1200'		
Depth Logger	1194'		
Bottom Logged Interval	1193'		
Top Log Interval	SURFACE		
Open Hole Size	6"		
Type Fluid	H2O		
Density / Viscosity	NA/NA		
Max. Recorded Temp.	see FCT log		
Estimated Cement Top	SURFACE		
Time Well Ready	09:30 6/6/2011		
Time Logger on Bottom	13:00 6/6/2011		
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller/C.Miller		
Witnessed By	L.Howard (JE)		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9.625"	61'	470'				
TWO	6"	471'	1200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	10" ID	SURFACE	61'
Prot. String	6" PVC	6" ID	SURFACE	471'
Production String				
Liner				
Invoice No.	2011090	3x/10x/pdf/las	je1503.db	* FINAL PRINT *

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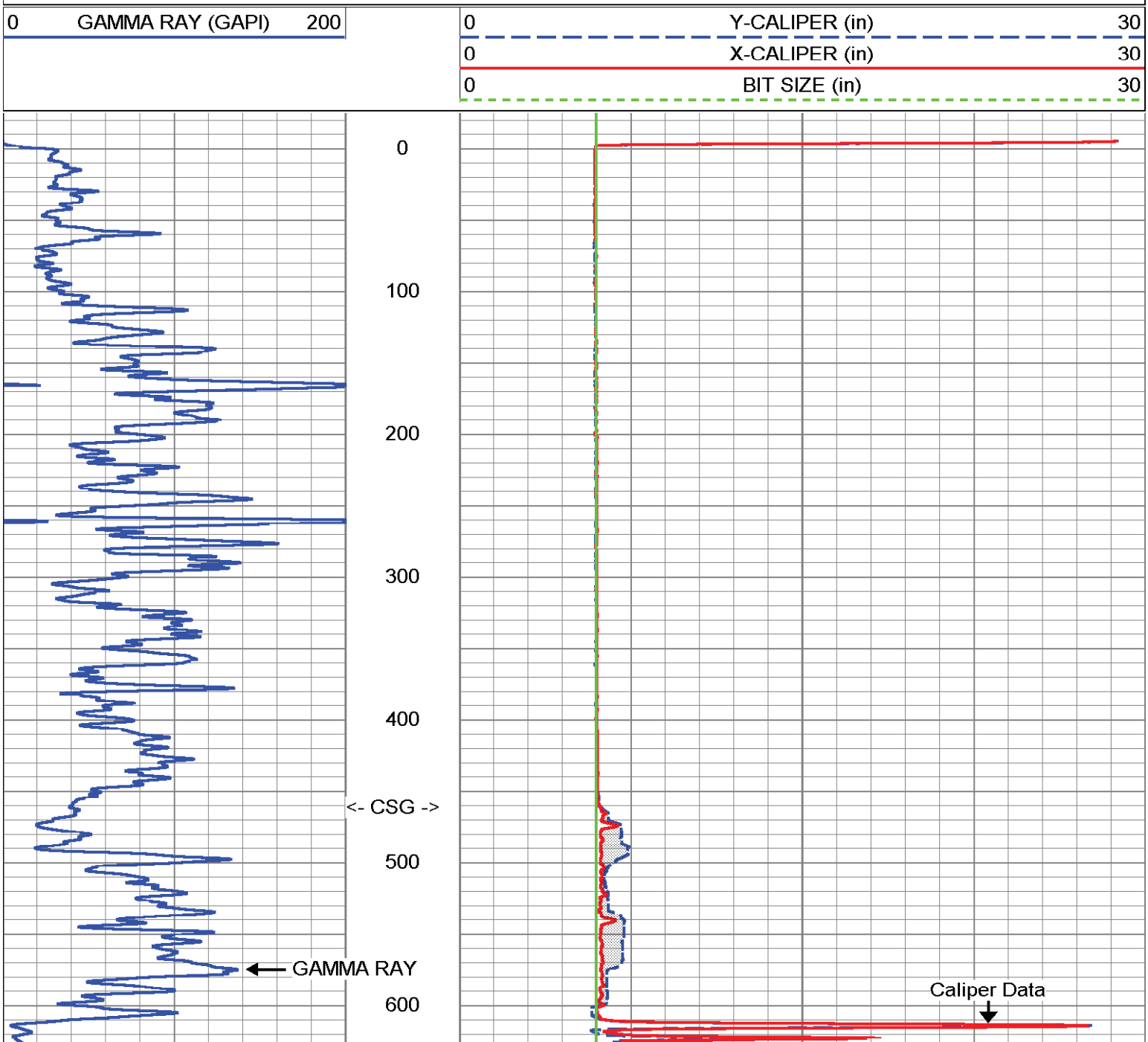
Comments

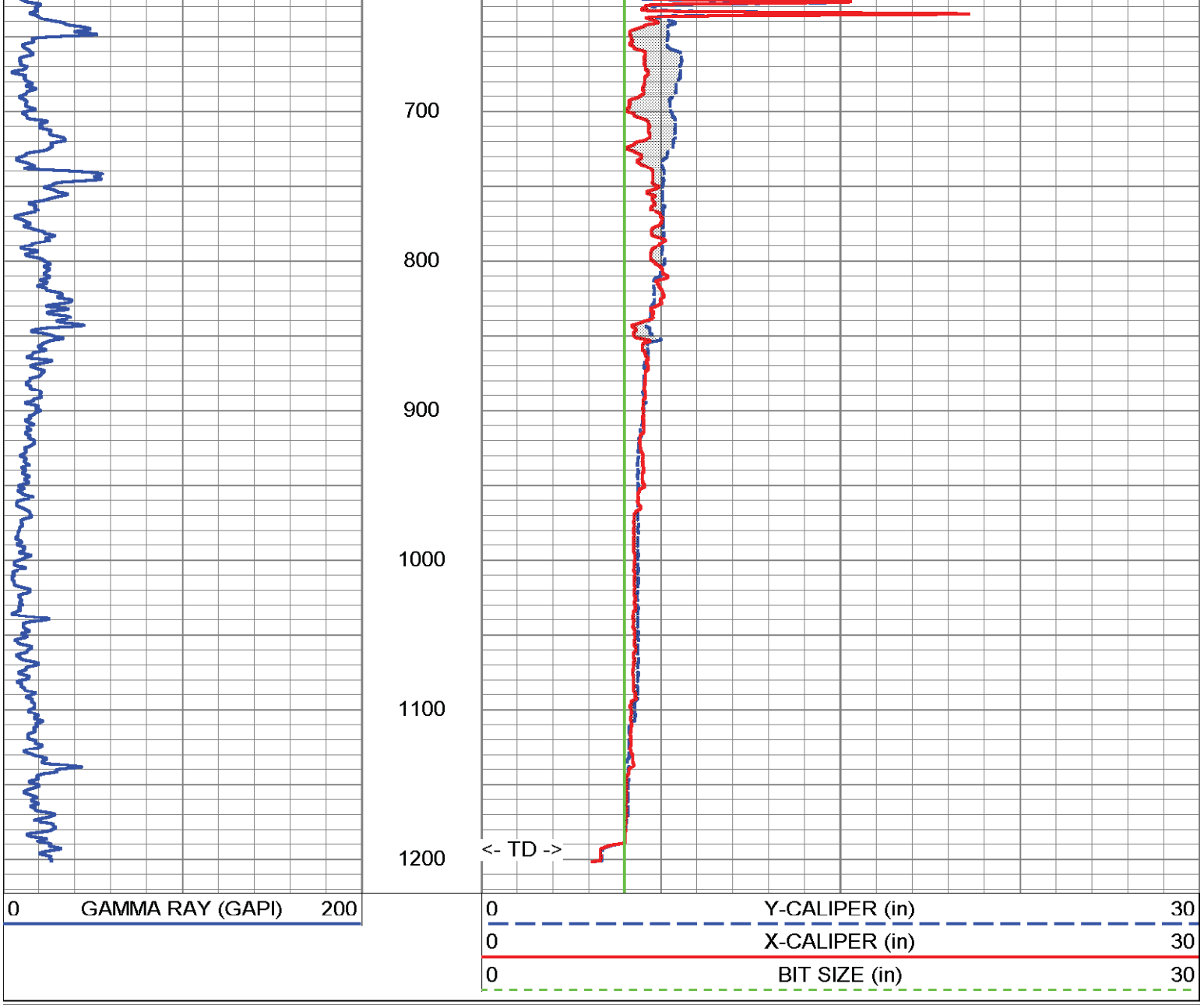
MAXIMUM Caliper Arm Extensions: 29"

MV Geophysical

MAIN PASS

Database File:	je1503.db
Dataset Pathname:	run2/MAIN
Presentation Format:	XY030-21
Dataset Creation:	Mon Jun 06 15:25:33 2011
Charted by:	Depth in Feet scaled 1:1200

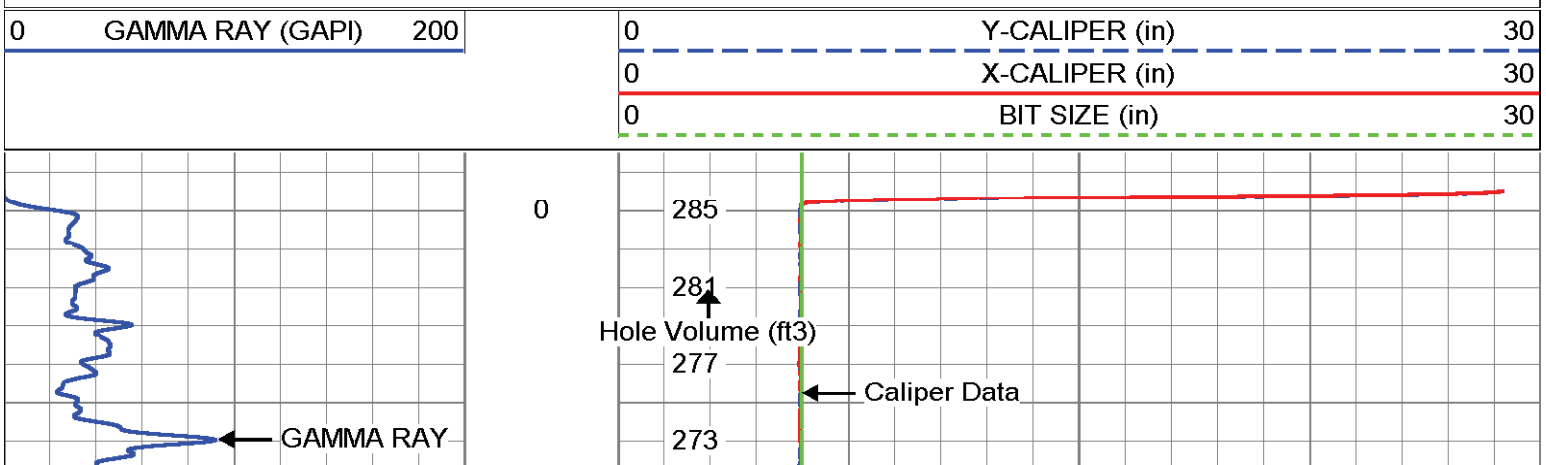


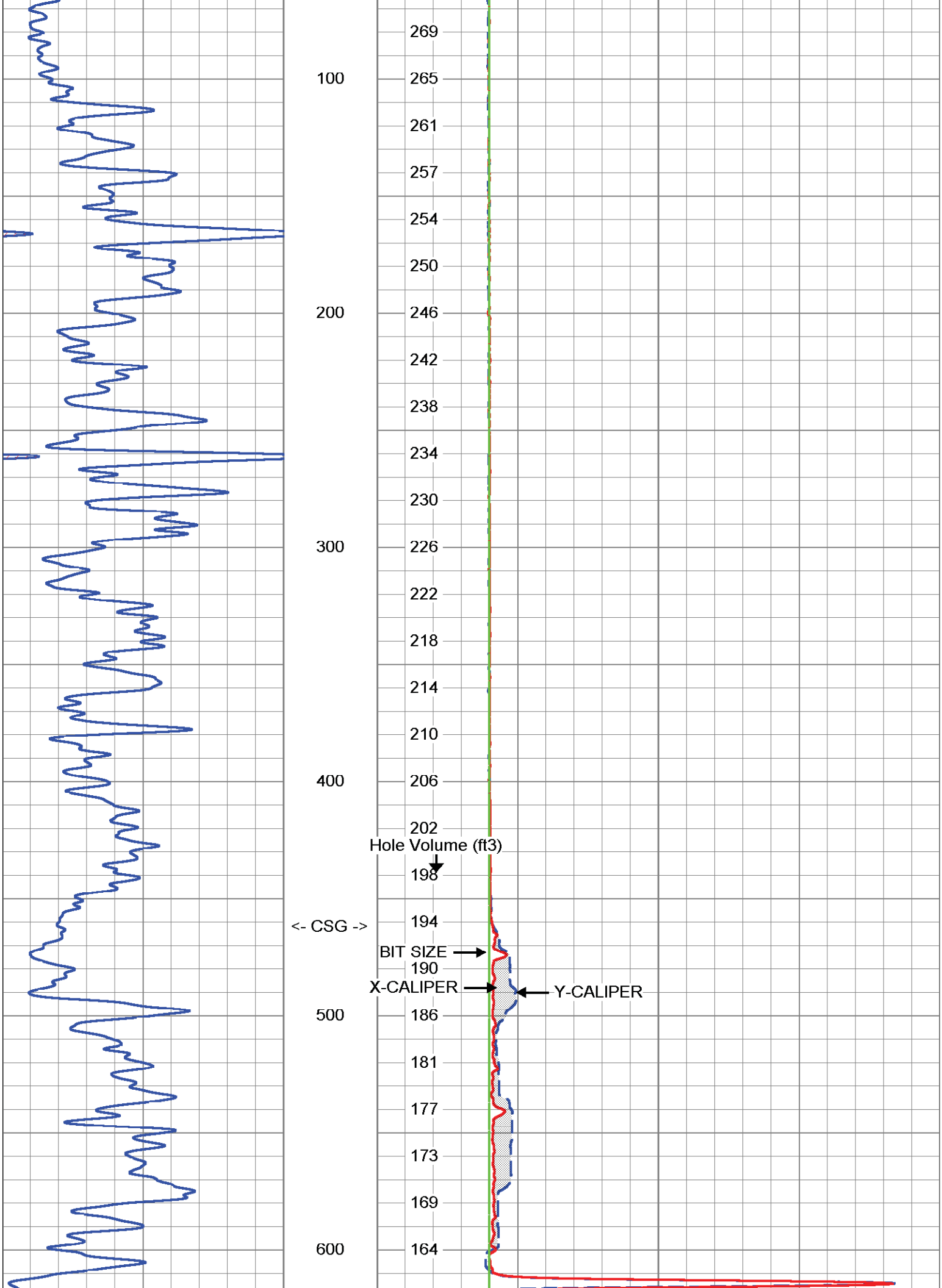


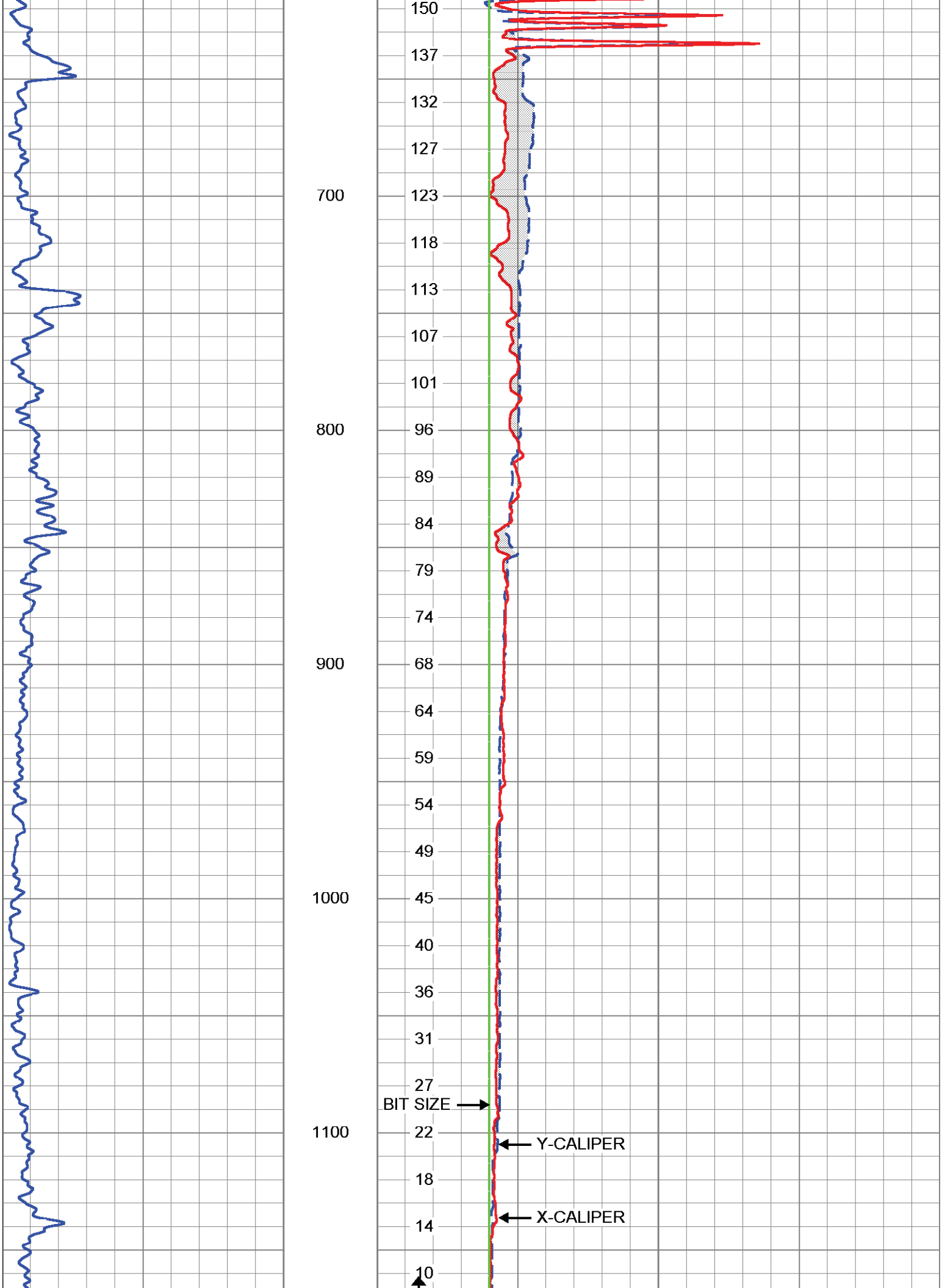
MV Geophysical

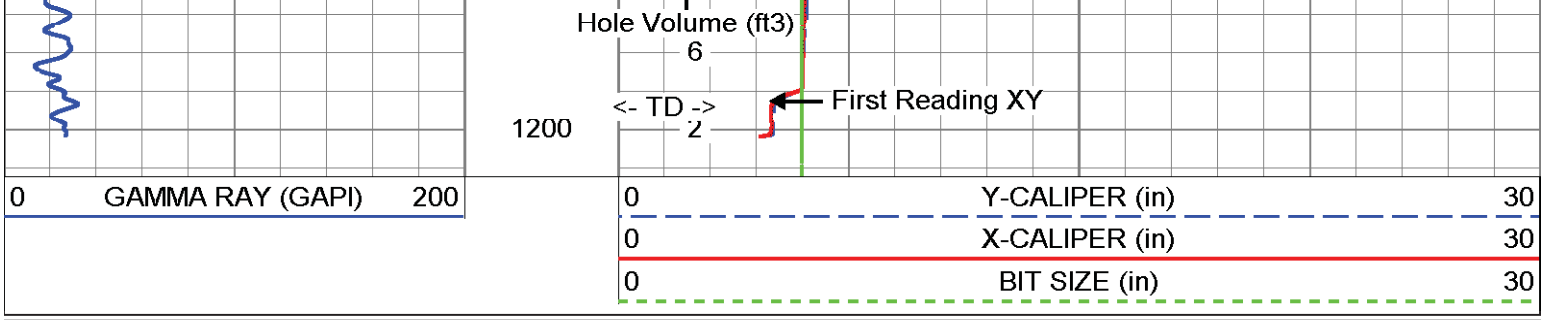
MAIN PASS

Database File: je1503.db
Dataset Pathname: run2/MAIN
Presentation Format: XY030-25
Dataset Creation: Mon Jun 06 15:25:33 2011
Charted by: Depth in Feet scaled 1:600




269
265
261
257
254
250
246
242
238
234
230
226
222
218
214
210
206
202
198
194
190
186
181
177
173
169
164
100
200
300
400
500
600
Hole Volume (ft3)
<- CSG ->
BIT SIZE
X-CALIPER
Y-CALIPER

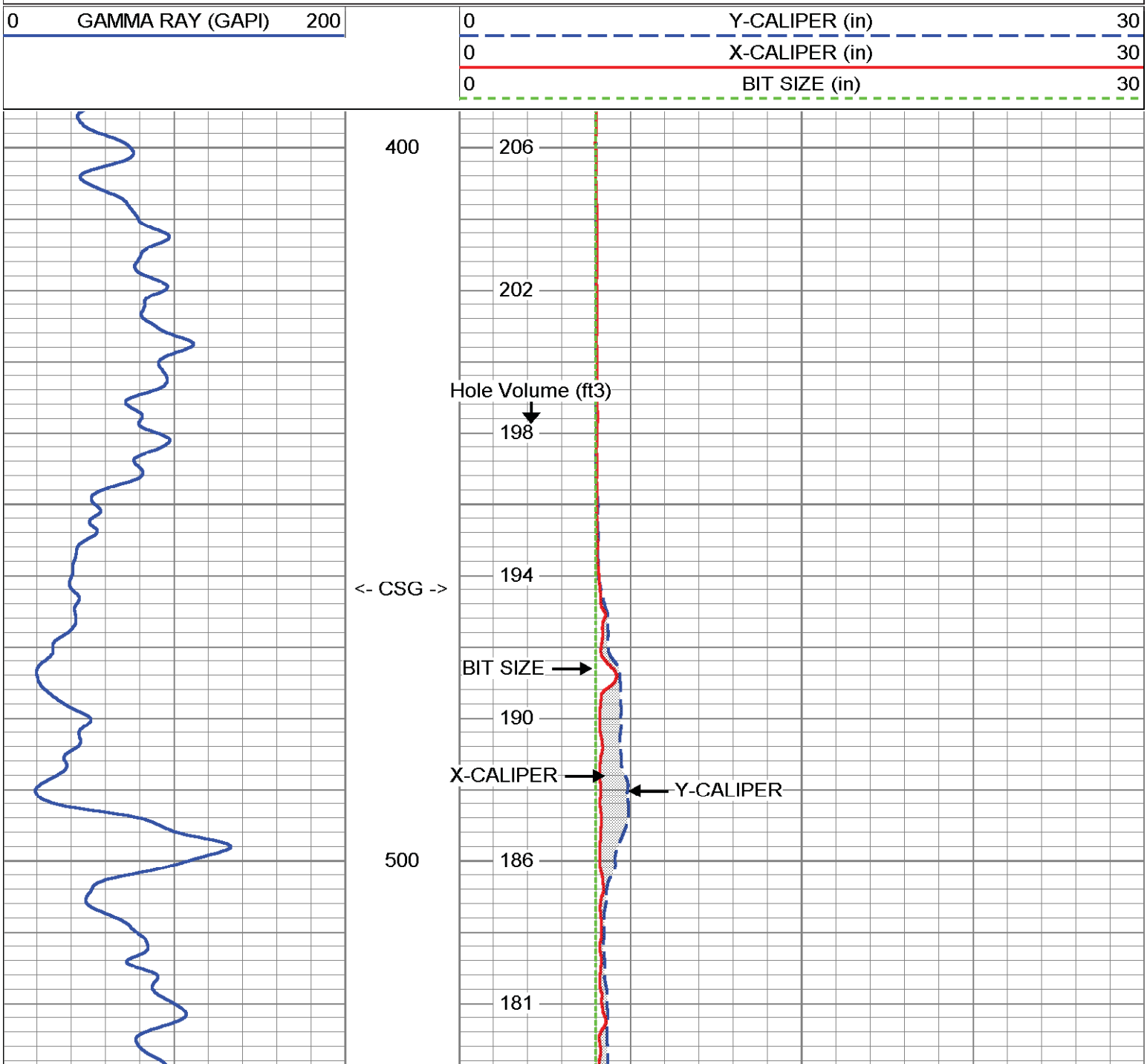

150
137
132
127
700
123
118
113
107
101
800
96
89
84
79
74
900
68
64
59
54
49
1000
45
40
36
31
27
BIT SIZE
1100
22
Y-CALIPER
18
X-CALIPER
14
10



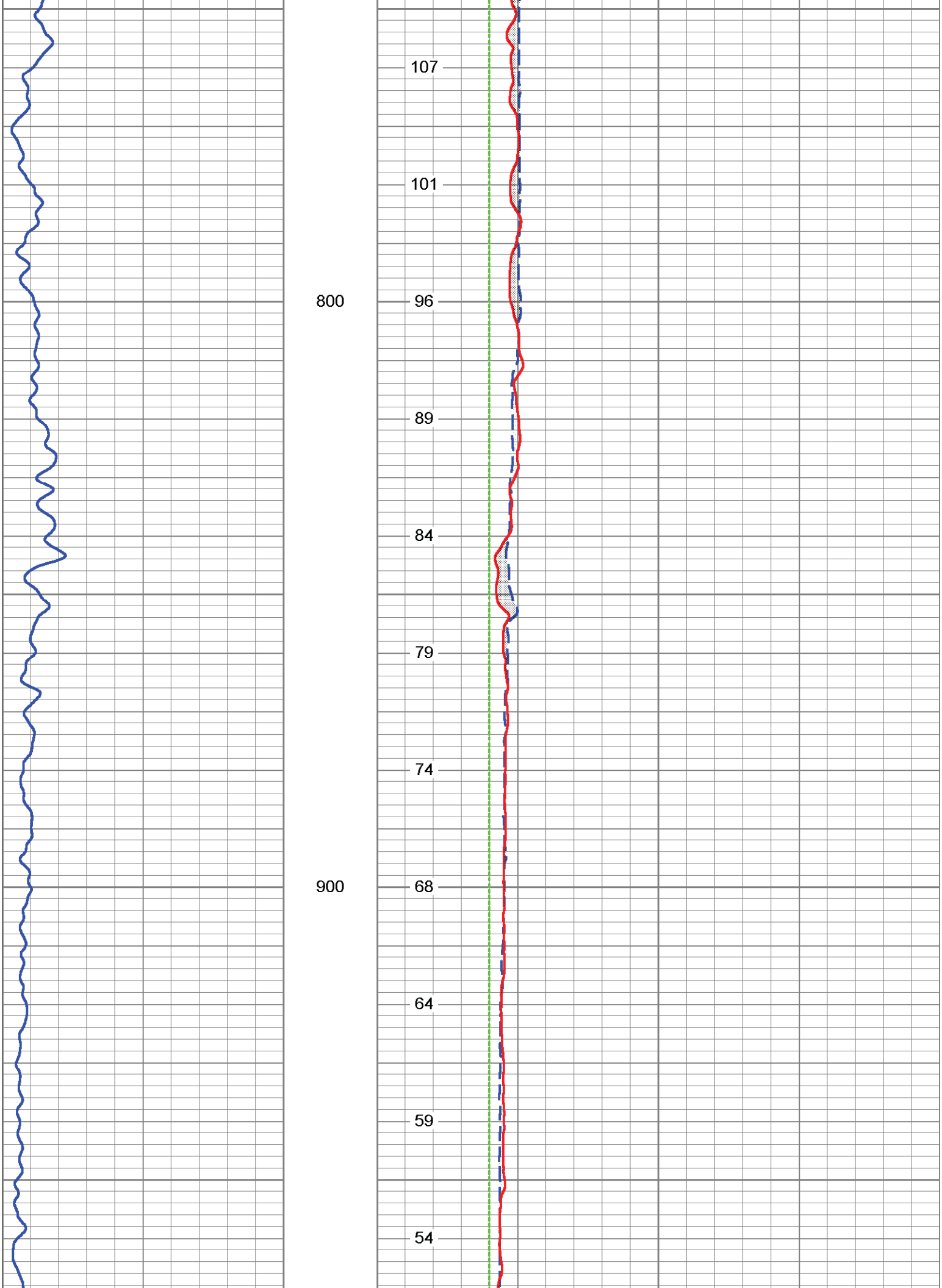
MV Geophysical

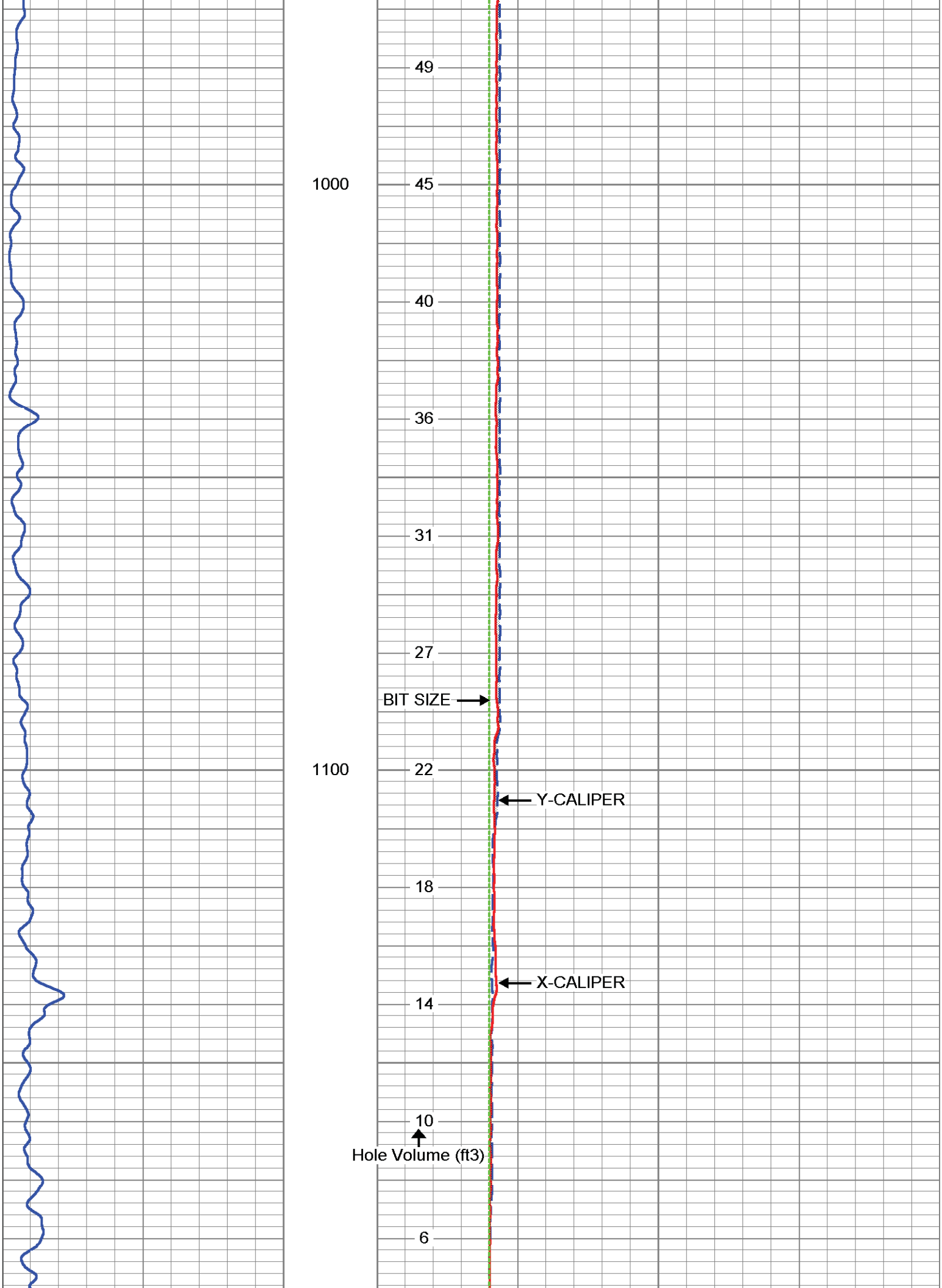
MAIN PASS

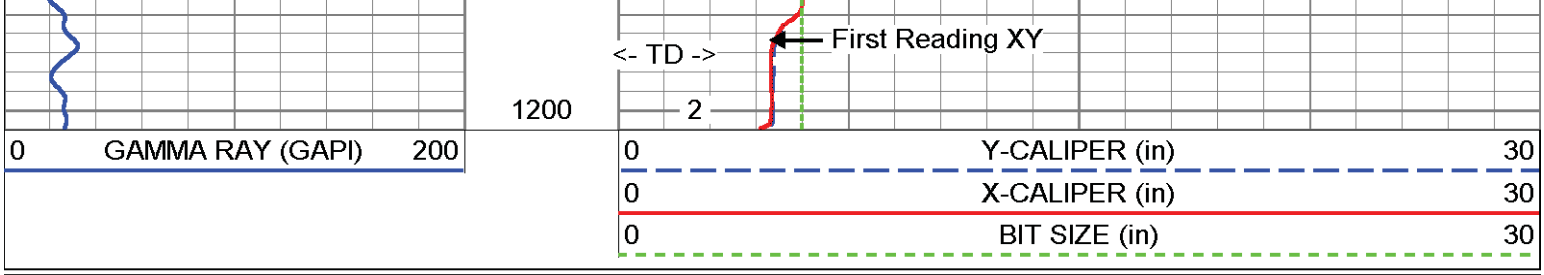
Database File: je1503.db
Dataset Pathname: run2/MAIN
Presentation Format: XY030-25
Dataset Creation: Mon Jun 06 15:25:33 2011
Charted by: Depth in Feet scaled 1:240




177
173
169
600
164
150
137
132
127
700
123
118
113


107
101
800
96
89
84
79
74
900
68
64
59
54

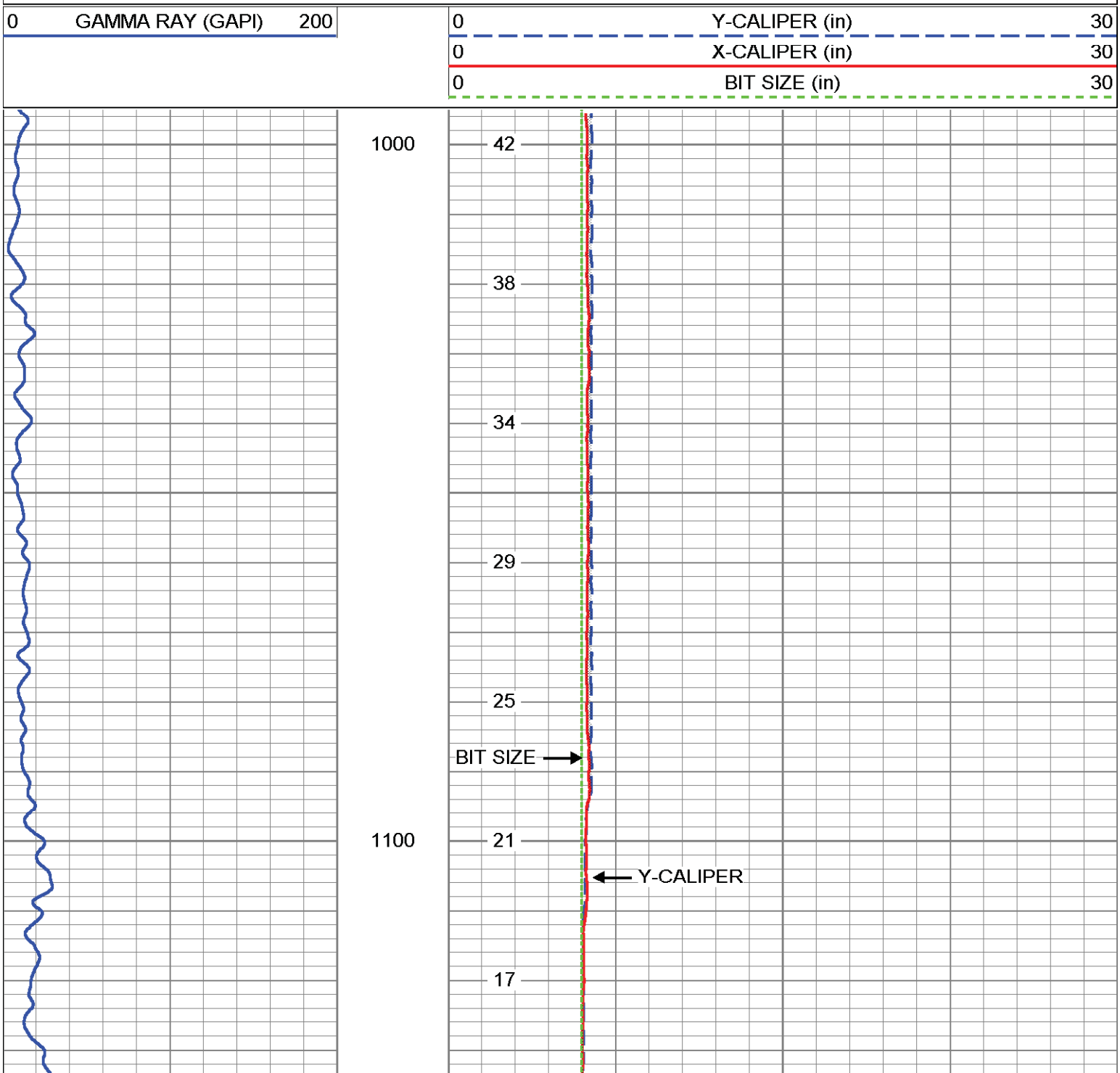

49
1000
45
40
36
31
27
BIT SIZE
1100
22
Y-CALIPER
18
X-CALIPER
14
10
Hole Volume (ft3)
6

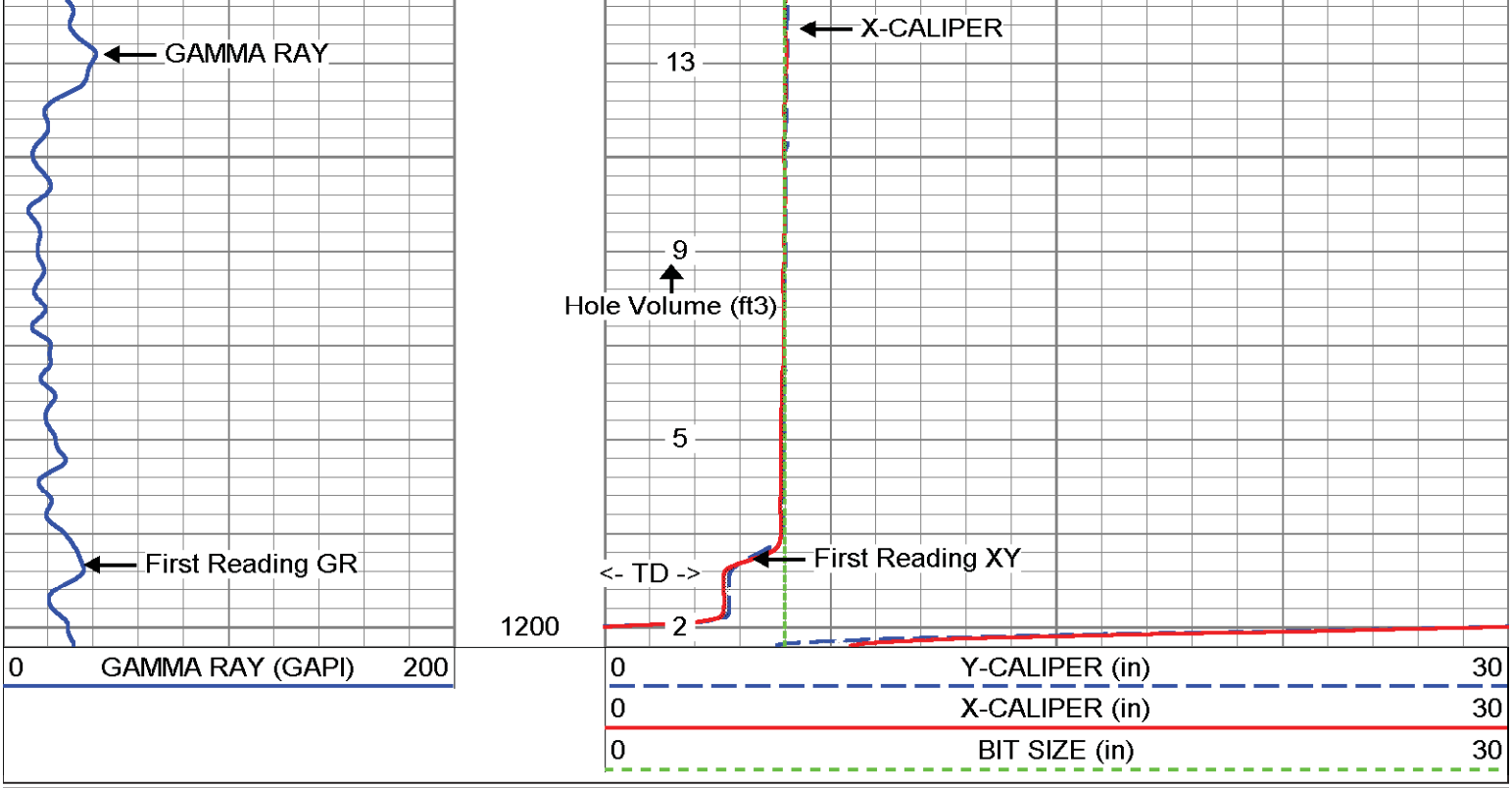


MV Geophysical

REPEAT SECTION

Database File: je1503.db
Dataset Pathname: run2/REPEAT
Presentation Format: XY030-25
Dataset Creation: Mon Jun 06 15:33:17 2011
Charted by: Depth in Feet scaled 1:240



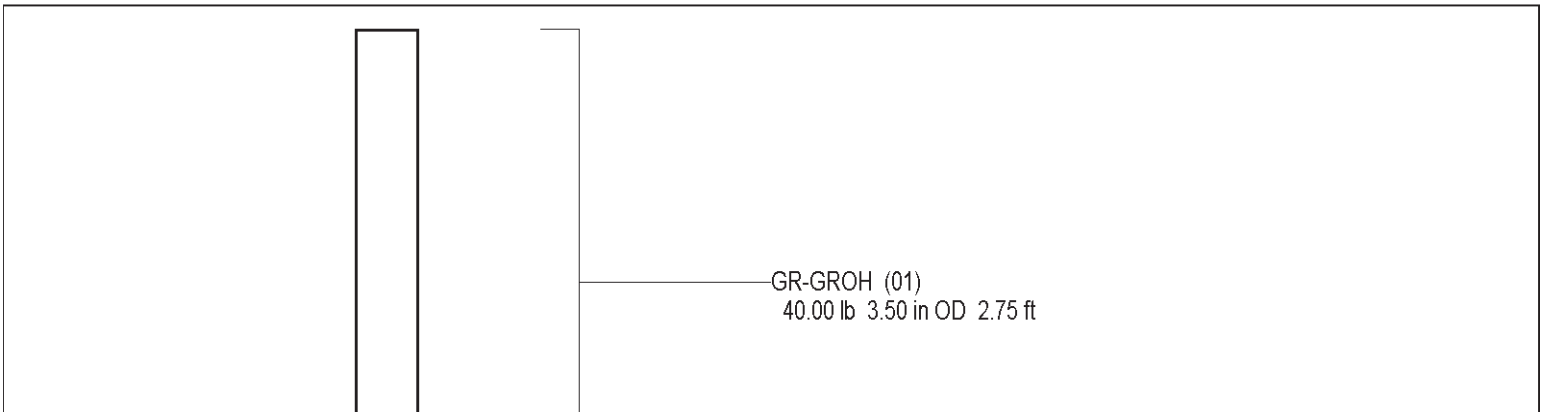


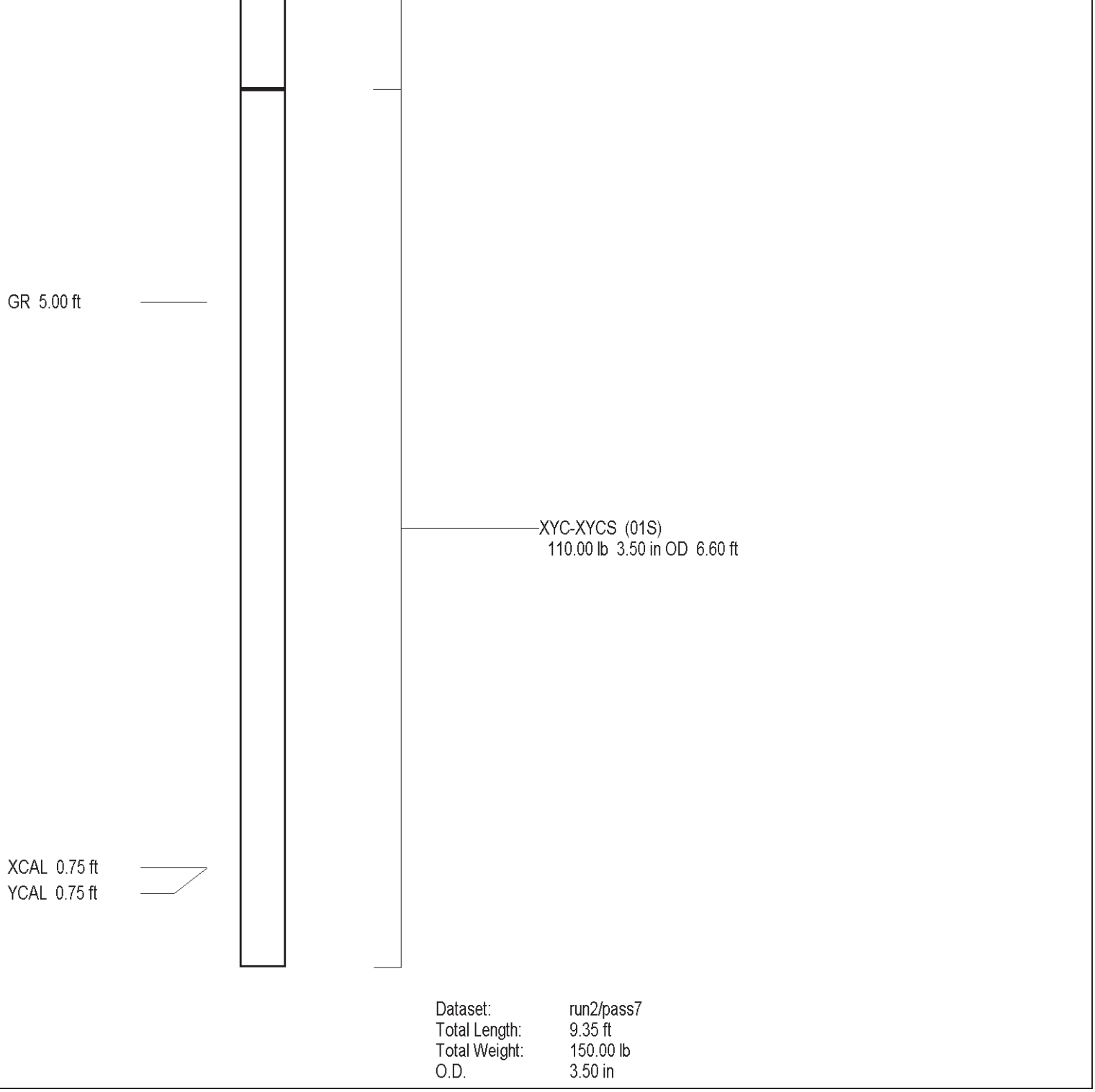
XY Caliper Calibration Report

Serial Number:	01S		
Tool Model:	XYCS		
Performed:	Mon Jun 06 13:45:07 2011		
Small Ring:	6	in	
Large Ring:	29	in	
	X Caliper	Y Caliper	
Reading with Small Ring:	620.5	614.2	cps
Reading with Large Ring:	1108.5	1074.5	cps
Gain:	0.0471311	0.0499674	
Offset:	-23.2449	-24.69	

Gamma Ray Calibration Report

Serial Number:	01	
Tool Model:	GROH	
Performed:	Fri Jun 03 15:40:42 2011	
Calibrator Value:	120	GAPI
Background Reading:	13.47	cps
Calibrator Reading:	130.647	cps
Sensitivity:	1.02409	GAPI/cps





Dataset:	run2/pass7
Total Length:	9.35 ft
Total Weight:	150.00 lb
O.D.	3.50 in

MV Geophysical

DUAL INDUCTION LL3 / SP LOG

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte
State/Prv Florida

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte State/Prv . Florida

Location
CCU/Babcock Ranch Test Well Project
Sec. 11 T41S R26E
LAT: 26 55' 29.6" N LONG: 81 41' 28.7" W

Other Services
XY/GR,DIL
FCT,FLOW
F.Samples

Permanent Datum	G.L.	Elevation
Log Measured From	G.L.	
Drilling Measured From	G.L.	

Elevation
K.B.
D.F.
G.L.

Date	6-JUN-2011		
Run Number	TWO		
Depth Driller	1200'		
Depth Logger	1194'		
Bottom Logged Interval	1193'		
Top Log Interval	472'		
Open Hole Size	6"		
Type Fluid	H2O		
Density / Viscosity	NA/NA		
Max. Recorded Temp.	see FCT log		
Estimated Cement Top	SURFACE		
Time Well Ready	09:30 6/6/2011		
Time Logger on Bottom	14:00 6/6/2011		
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller/C.Miller		
Witnessed By	L.Howard (JE)		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9.625"	61'	470'				
TWO	6"	471'	1200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	10" ID	SURFACE	61'
Prot. String	6" PVC	6" ID	SURFACE	471'
Production String				
Liner				
Invoice No.	2011090	3x/10x/pdf/las	je1503.db	* FINAL PRINT *

<< Fold Here >>

Comments

Rw=4.292 ohm-m @ 83.1 degF

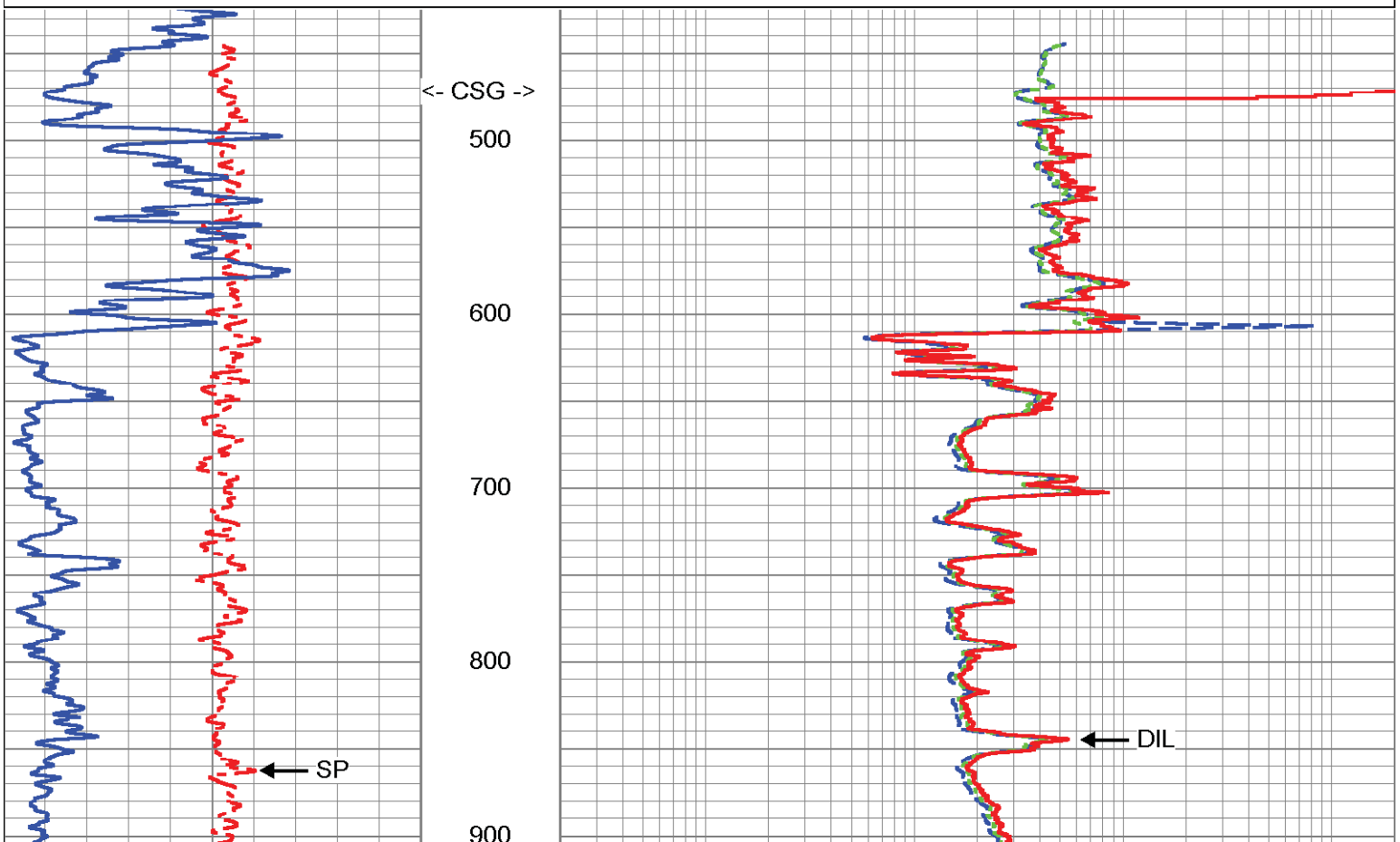
MV Geophysical

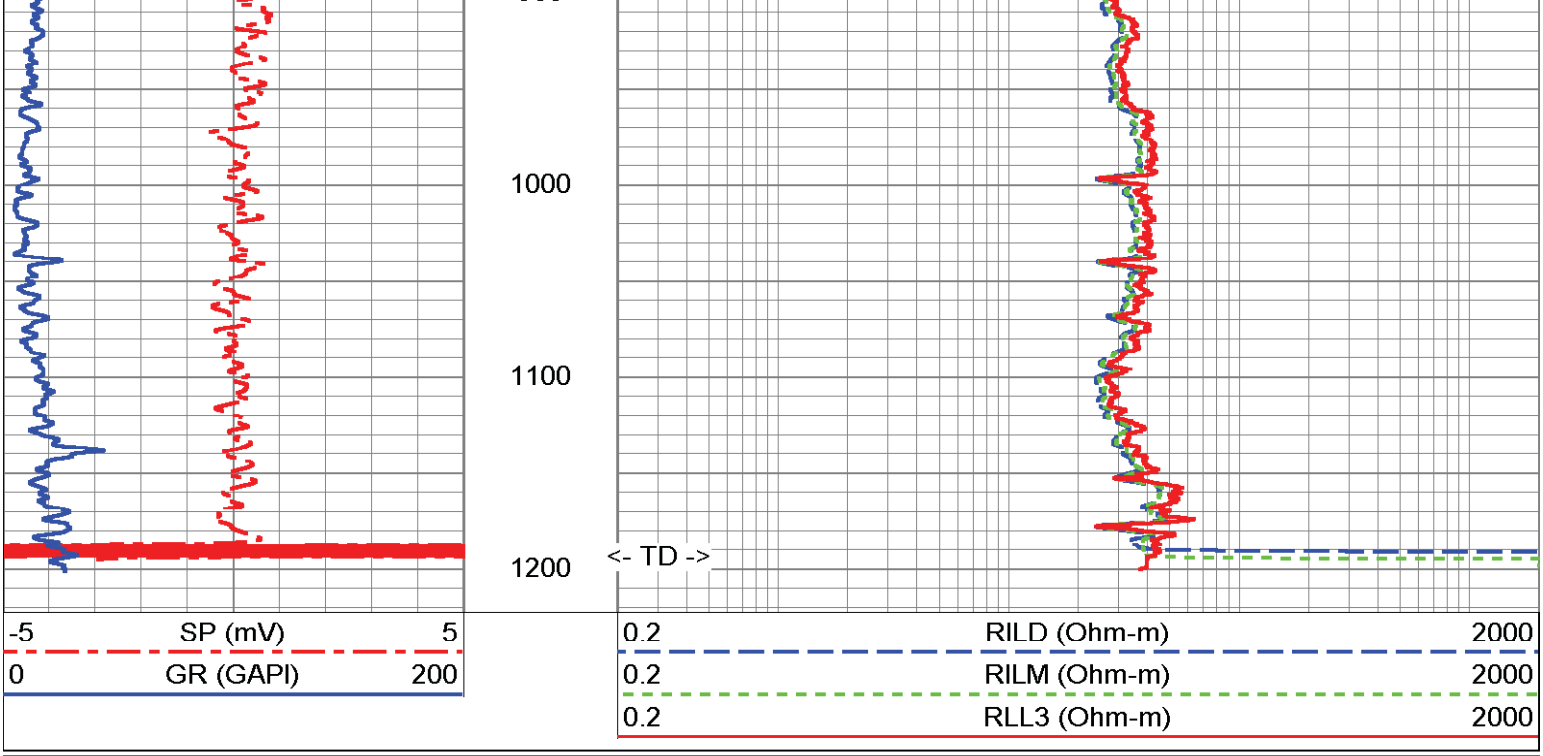
MAIN PASS

Database File:	je1503.db
Dataset Pathname:	run2/MAIN
Presentation Format:	DIL1200
Dataset Creation:	Mon Jun 06 15:25:33 2011
Charted by:	Depth in Feet scaled 1:1200

-5	SP (mV)	5
0	GR (GAPI)	200

0.2	RILD (Ohm-m)	2000
0.2	RILM (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000

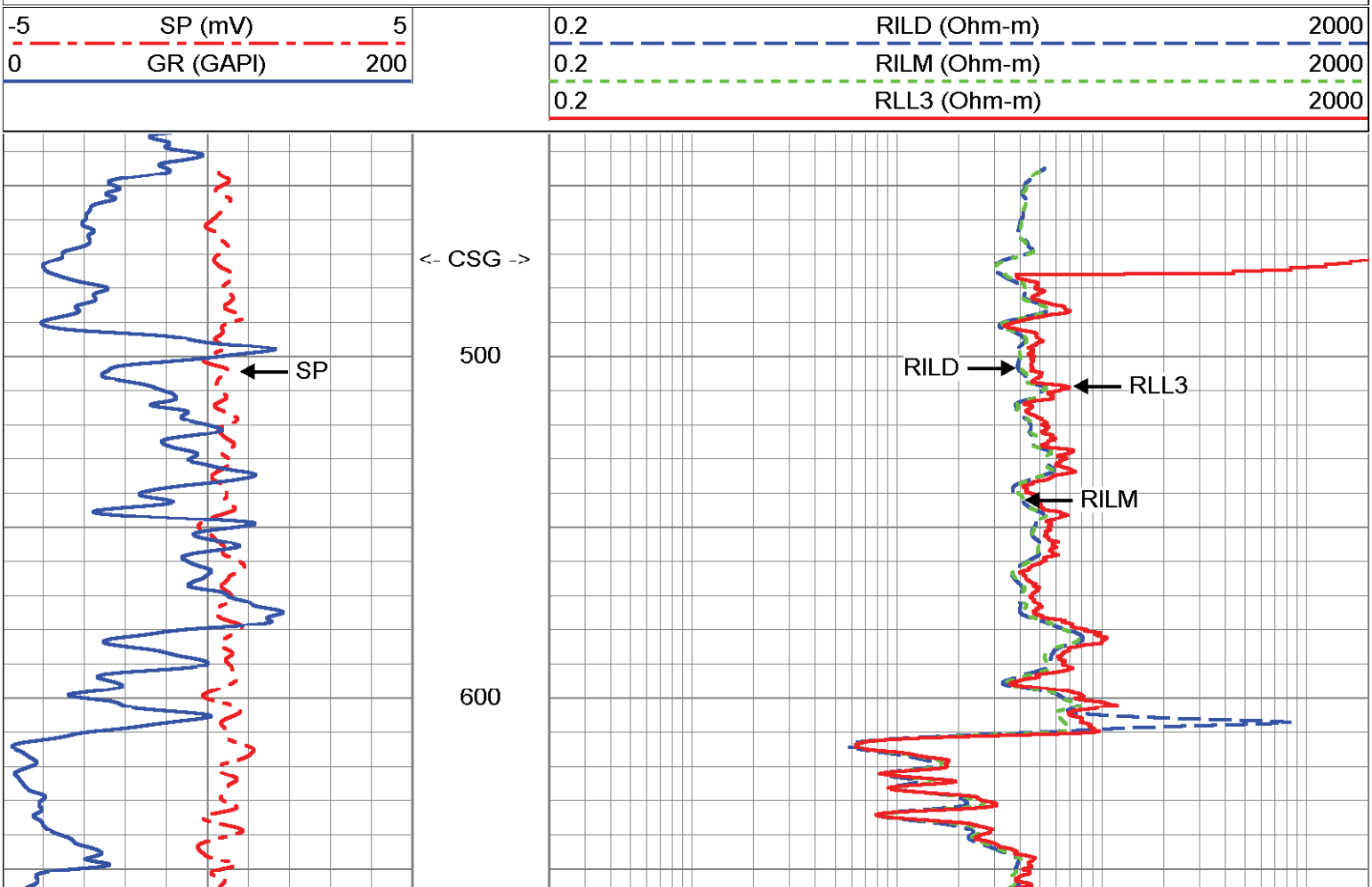


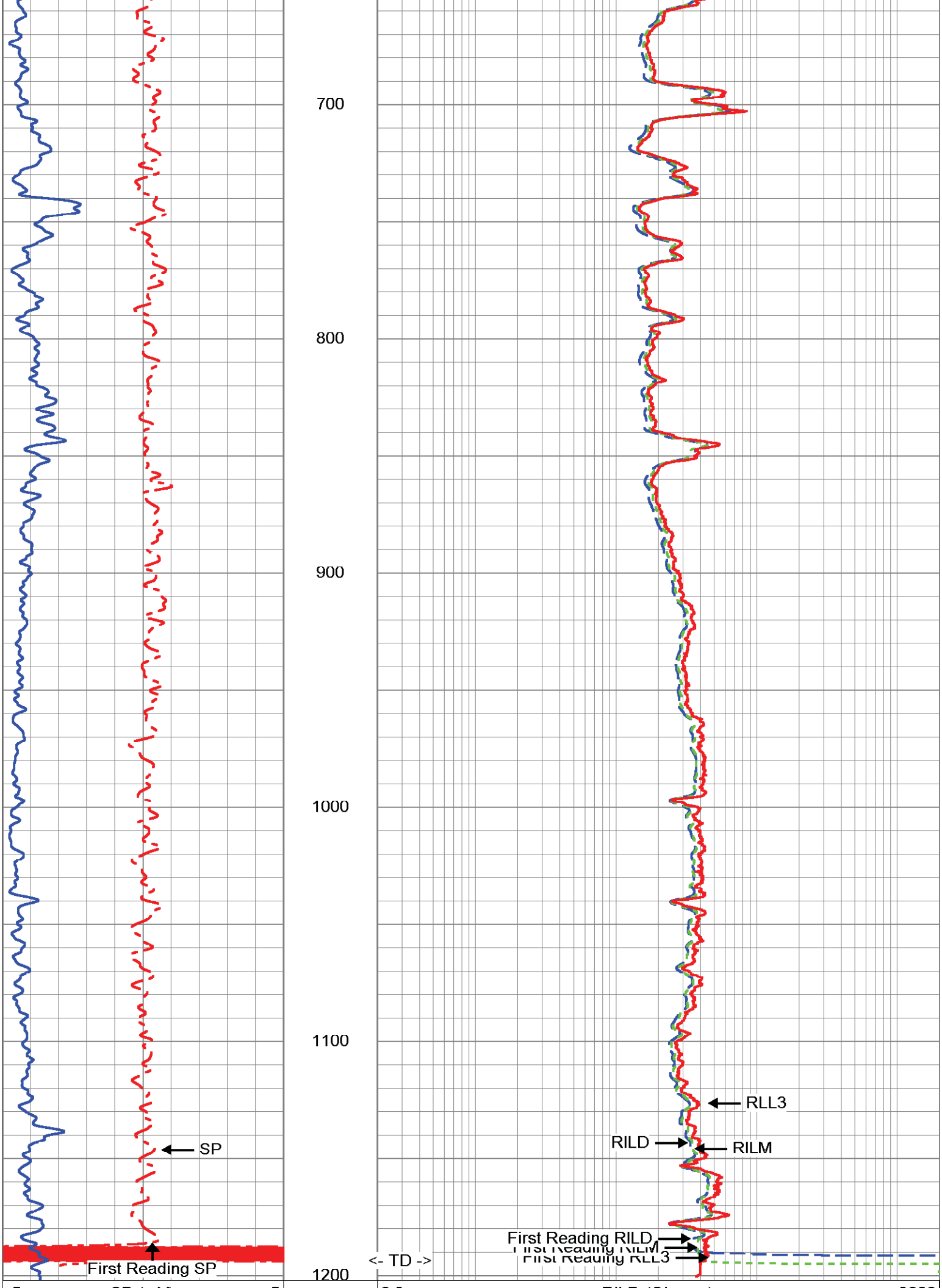


MV Geophysical

MAIN PASS

Database File:	je1503.db
Dataset Pathname:	run2/MAIN
Presentation Format:	DIL200
Dataset Creation:	Mon Jun 06 15:25:33 2011
Charted by:	Depth in Feet scaled 1:600




700
800
900
1000
1100
1200
SP
First Reading SP
RLL3
RILD
RILM
First Reading RILD
First Reading RILM
First Reading RLL3
<- TD ->
-5
5
0.2
2000

-5	SP (mV)	5
0	GR (GAPI)	200

0.2	RILD (Ohm-m)	2000
0.2	RILM (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000

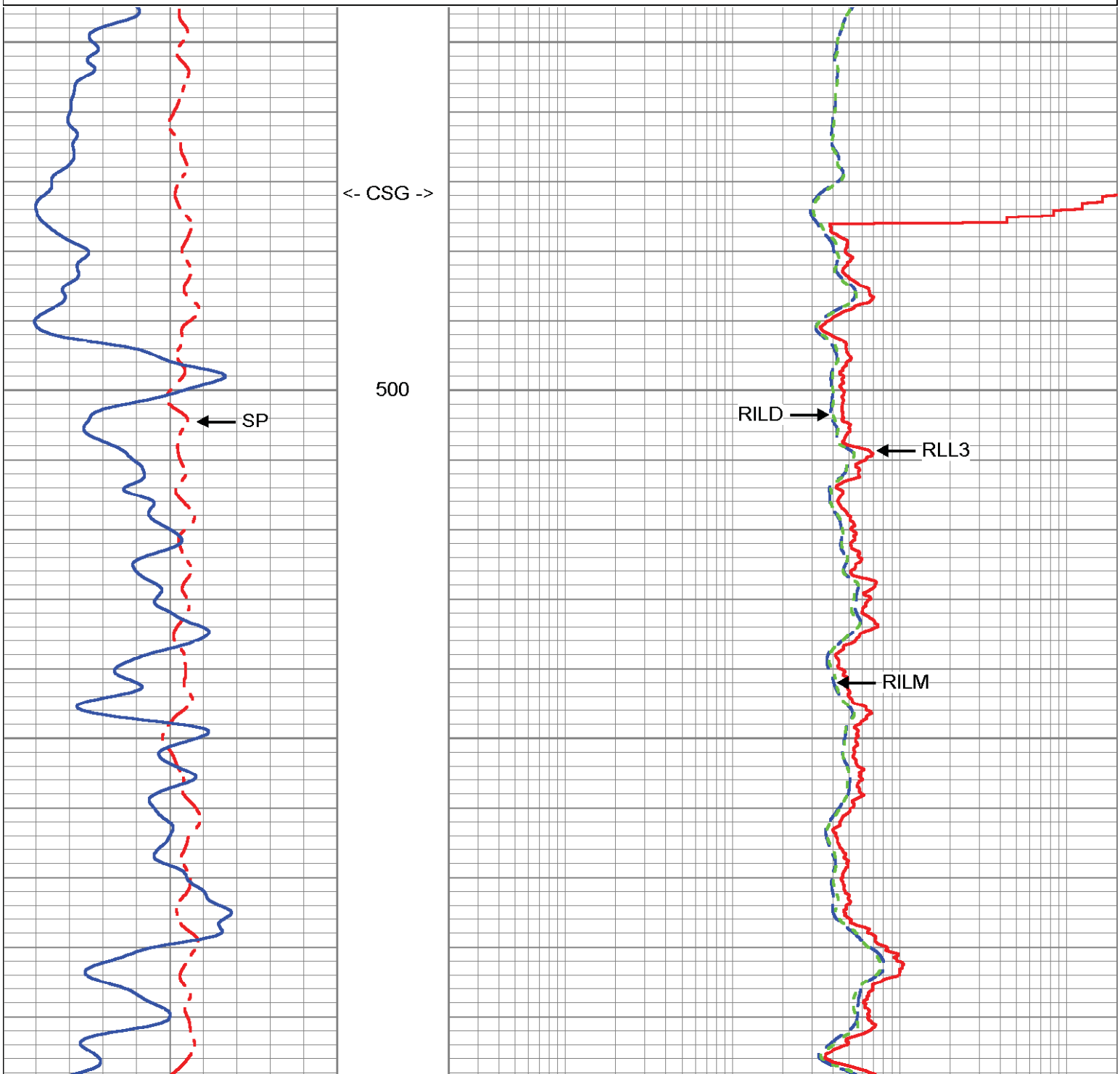
MV Geophysical

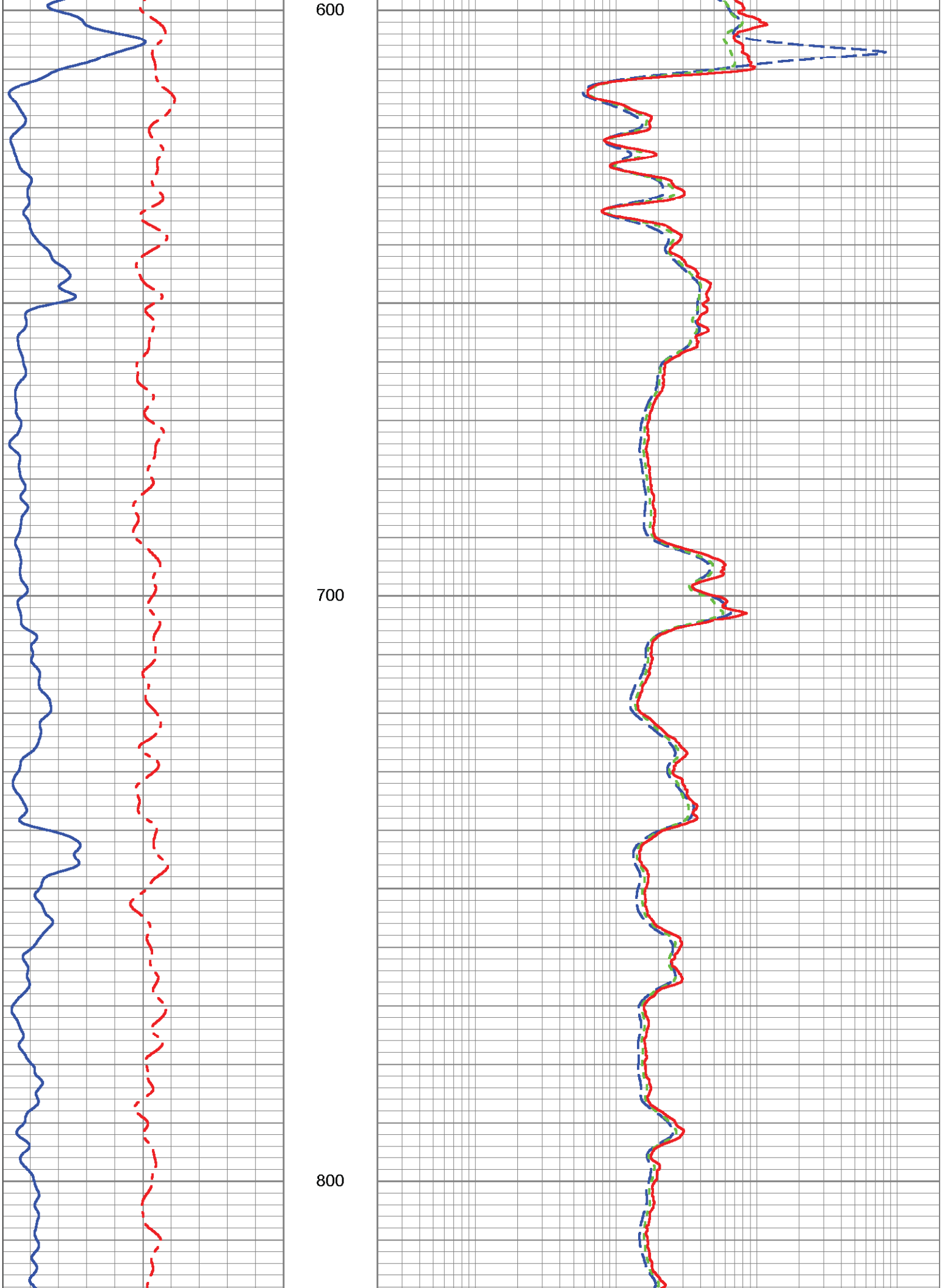
MAIN PASS

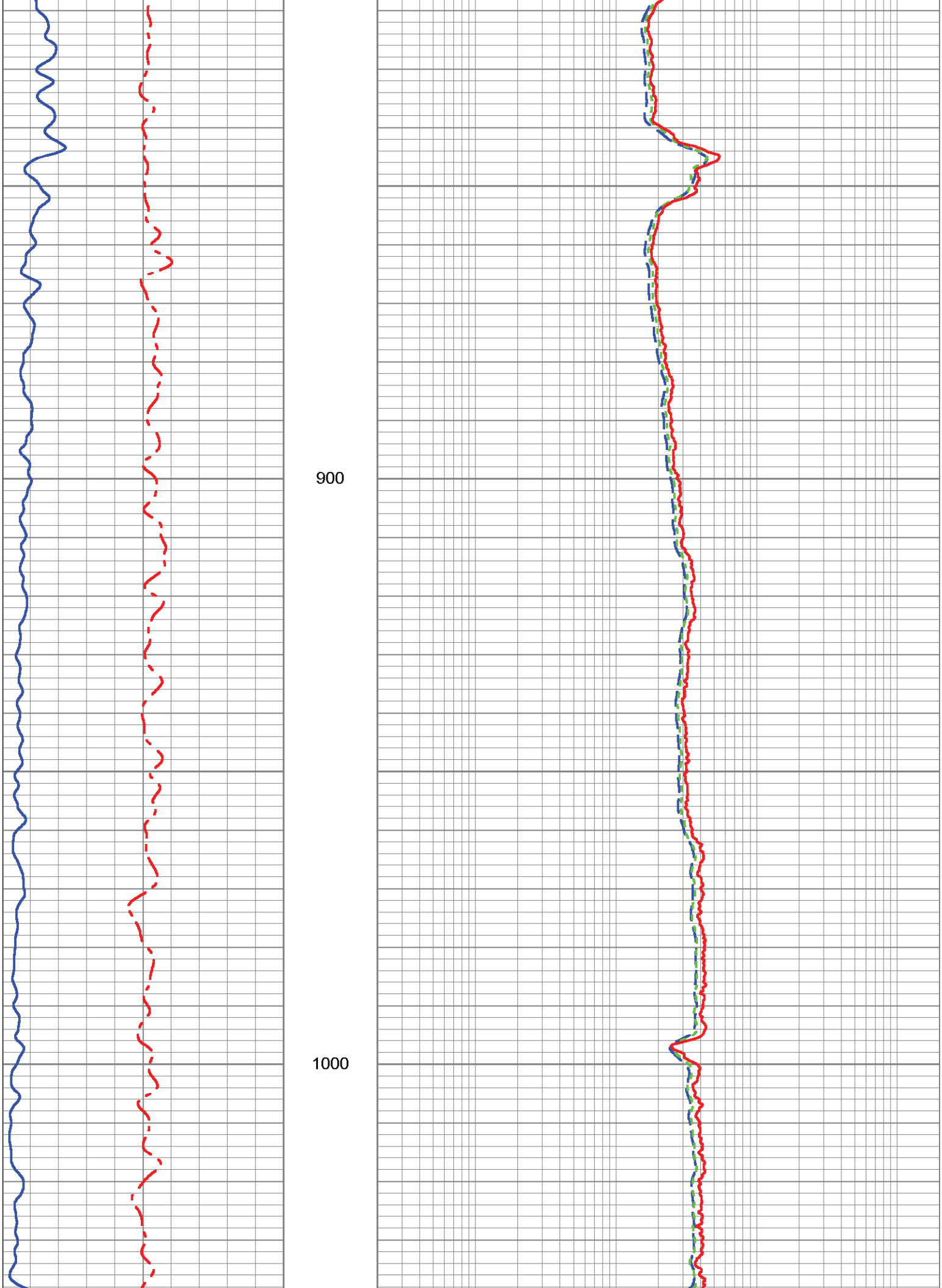
Database File:	je1503.db
Dataset Pathname:	run2/MAIN
Presentation Format:	DIL200
Dataset Creation:	Mon Jun 06 15:25:33 2011
Charted by:	Depth in Feet scaled 1:240

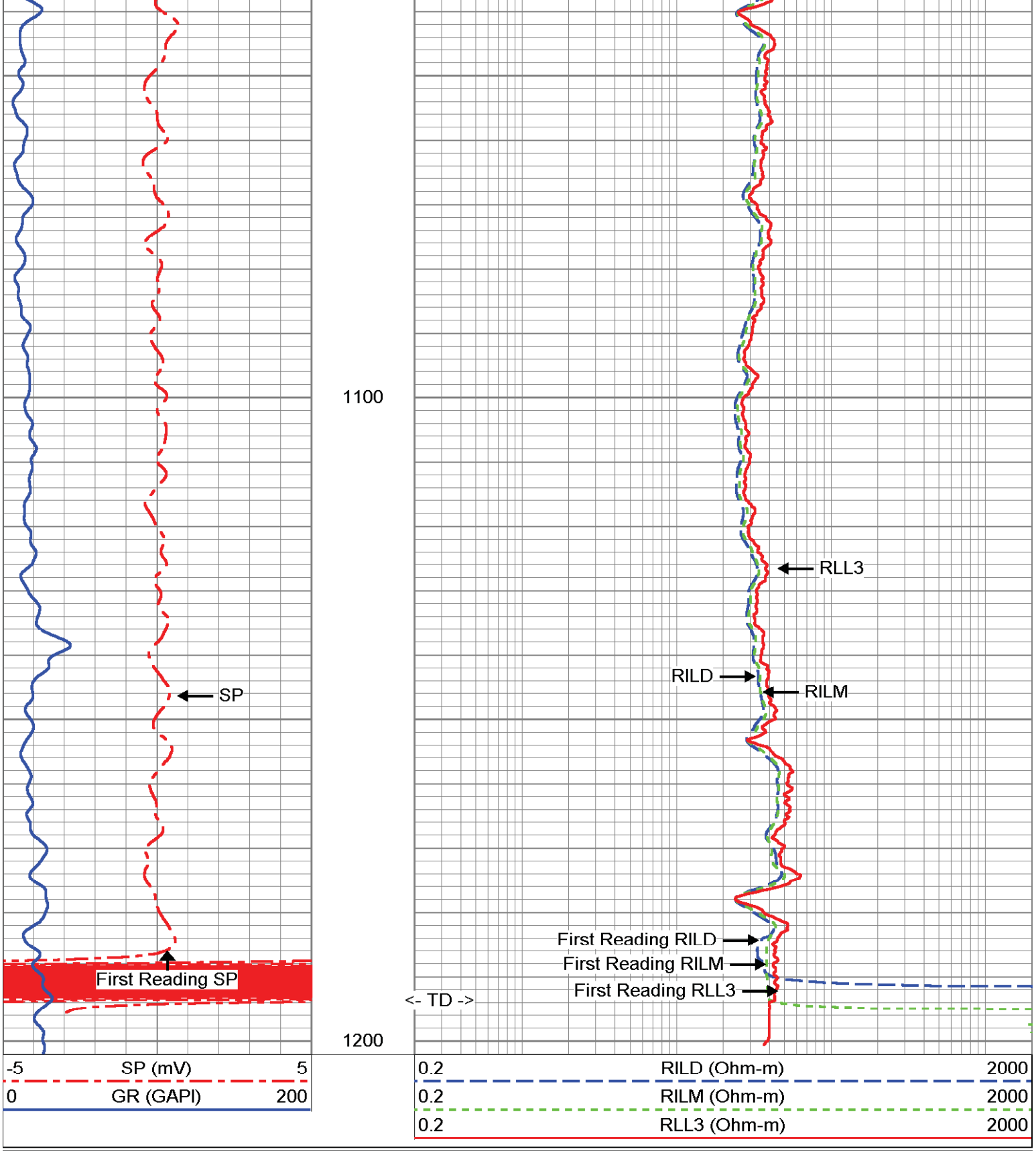
-5	SP (mV)	5
0	GR (GAPI)	200

0.2	RILD (Ohm-m)	2000
0.2	RILM (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000




600
700
800


900
1000

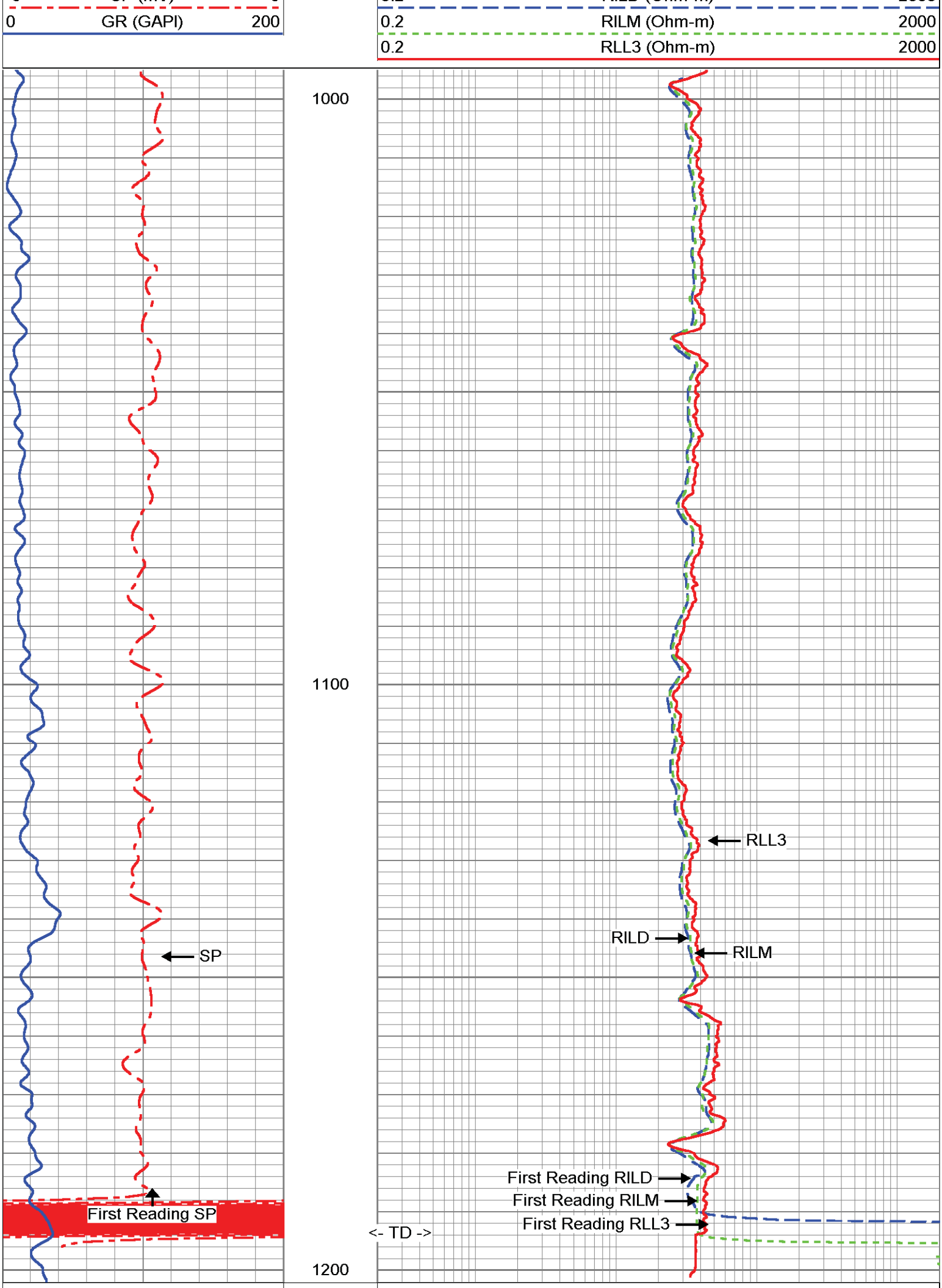


MV Geophysical

REPEAT SECTION

Database File:	je1503.db
Dataset Pathname:	run2/REPEAT
Presentation Format:	DIL200
Dataset Creation:	Mon Jun 06 15:33:17 2011
Charted by:	Depth in Feet scaled 1:240

-5 SP (mV) 5
0 GR (GAPI) 200
0.2 RILD (Ohm-m) 2000
0.2 RILM (Ohm-m) 2000
0.2 RLL3 (Ohm-m) 2000


0
GR (GAPI)
200
0.2
RILM (Ohm-m)
2000
0.2
RLL3 (Ohm-m)
2000
1000
1100
1200
SP
First Reading SP
RLL3
RILD
RILM
First Reading RILD
First Reading RILM
First Reading RLL3
<- TD ->

-5	SP (mV)	5
0	GR (GAPI)	200

0.2	RILD (Ohm-m)	2000
0.2	RILM (Ohm-m)	2000
0.2	RLL3 (Ohm-m)	2000

Dual Induction Calibration Report

Serial-Model:	5390-R
Surface Cal Performed:	Wed Apr 21 11:17:23 2010
Downhole Cal Performed:	Wed Apr 21 11:04:55 2010
After Survey Verification Performed:	Wed Apr 21 11:04:55 2010

Surface Calibration

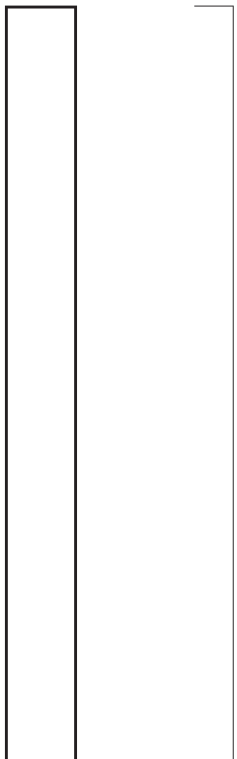
	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.050	0.645	V	0.000	400.000	mmho-m	672.269	-33.613
Medium	0.018	0.735	V	0.000	464.000	mmho-m	647.120	-11.545
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.011	0.641	V	0.000	400.000	mmho-m	634.921	-6.984
Medium	0.005	0.739	V	0.000	464.000	mmho-m	632.408	-3.370

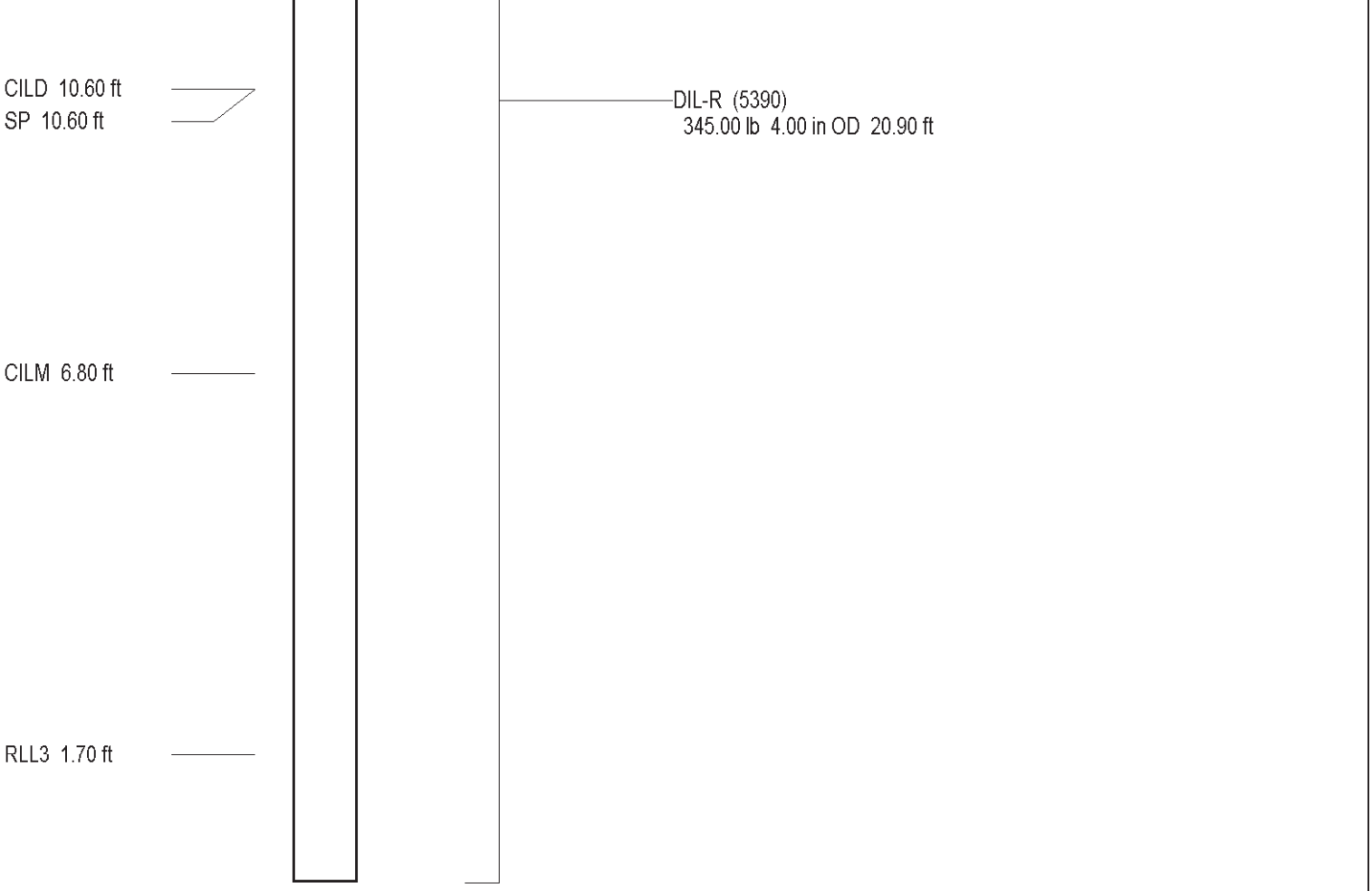
Downhole Calibration

	Readings			References			Results	
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	-43.158	78.288	mmho-m	-42.562	77.982	mmho-m	0.993	0.275
Medium	-9.475	466.701	mmho-m	-8.097	466.698	mmho-m	0.997	1.351
Shallow	2.516	0.025	V	494.500	2.000	Ohm-m	197.709	-2.980

After Survey Verification

	Readings			Targets			Results	
Internal:	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho-m	-43.158	78.288	mmho-m	0.993	0.275
Medium	0.000	0.000	mmho-m	-9.475	466.701	mmho-m	0.997	1.351
Shallow	0.000	0.000	Ohm-m	494.500	2.000	Ohm-m	1.000	0.000





Dataset:	run2/pass10
Total Length:	20.90 ft
Total Weight:	345.00 lb
O.D.	4.00 in

MV Geophysical

FLUID CONDUCTIVITY TEMPERATURE LOG

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte
State/Prv Florida

Company	Johnson Engineering, Inc.
Well	JE1503
Field	Babcock Ranch
County	Charlotte
State/Prv .	Florida

Location
CCU/Babcock Ranch Test Well Project
Sec. 11 T41S R26E
LAT: 26 55' 29.6" N LONG: 81 41' 28.7" W

Other Services
XY/GR,DIL
FCT,FLOW
F.Samples

		Elevation
Permanent Datum	G.L.	
Log Measured From	G.L.	
Drilling Measured From	G.L.	

Elevation
K.B.
D.F.
G.L.

Date	6-JUN-2011		
Run Number	TWO		
Depth Driller	1200'		
Depth Logger	1194'		
Bottom Logged Interval	1194'		
Top Log Interval	400'		
Open Hole Size	6"		
Type Fluid	H2O		
Density / Viscosity	NA/NA		
Max. Recorded Temp.	see FCT log		
Estimated Cement Top	SURFACE		
Time Well Ready	09:30 6/6/2011		
Time Logger on Bottom	09:45 6/6/2011		
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller/C.Miller		
Witnessed By	L.Howard (JE)		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9.625"	61'	470'				
TWO	6"	471'	1200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	10" ID	SURFACE	61'
Prot. String	6" PVC	6" ID	SURFACE	471'
Production String				
Liner				
Invoice No.	2011090	3x/10x/pdf/las	je1503.db	* FINAL PRINT *

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Comments

STATIC and DYNAMIC down passes were performed.
Cw =2,330 uS/cm @ 28.4 degC @ Q=160 gpm.
FLUID RESISTIVITY CALIBRATION REPORT (Performed: 19-APR-11 14:45)
uS/cm CPS

223.7	3045.14
2564.78	2934.34
4417.01	2667.37

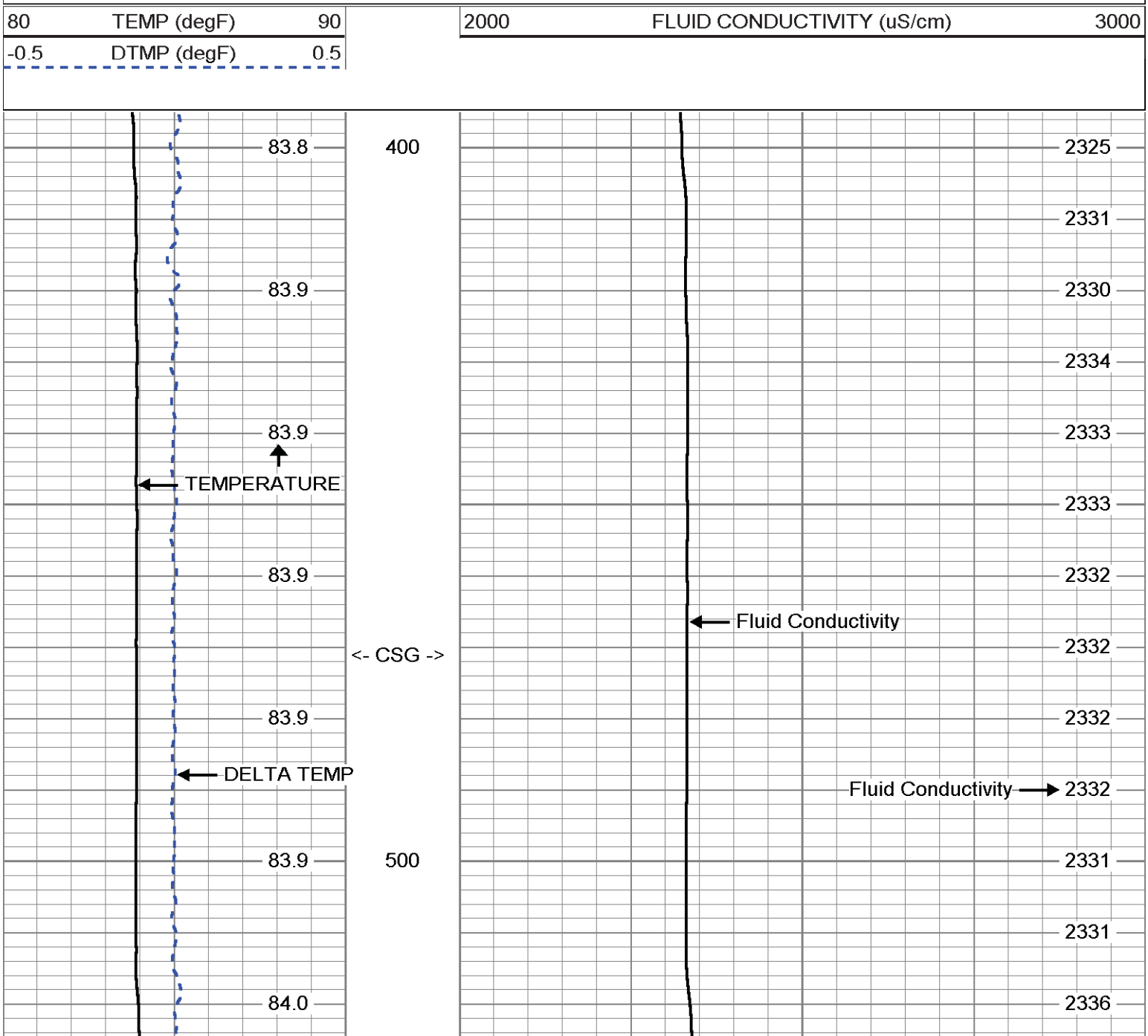
TEMPERATURE CALIBRATION REPORT (Performed: 19-APR-11 14:15)

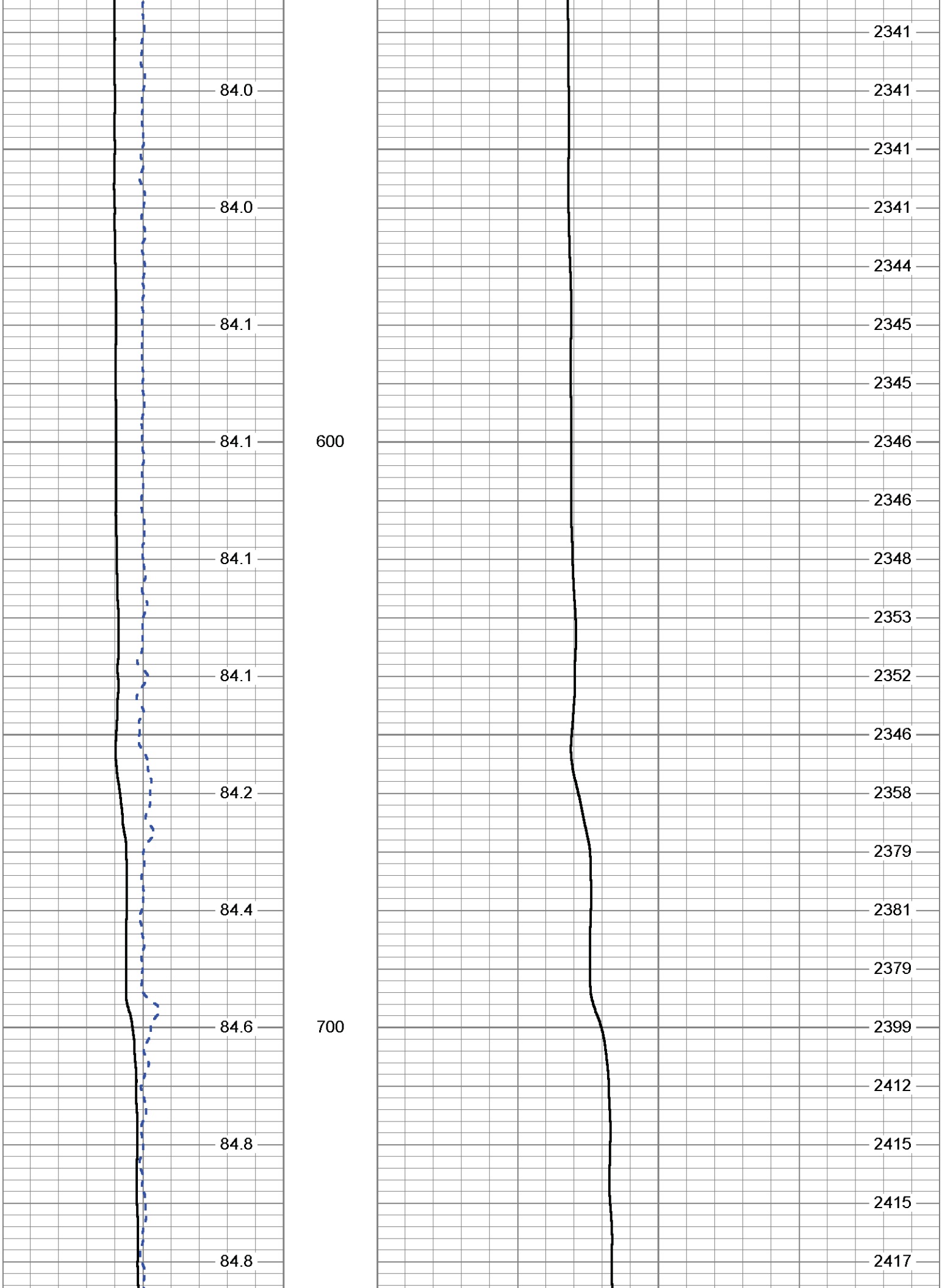
DEG-F	CPS
34.5	141.83
137.5	2605.14

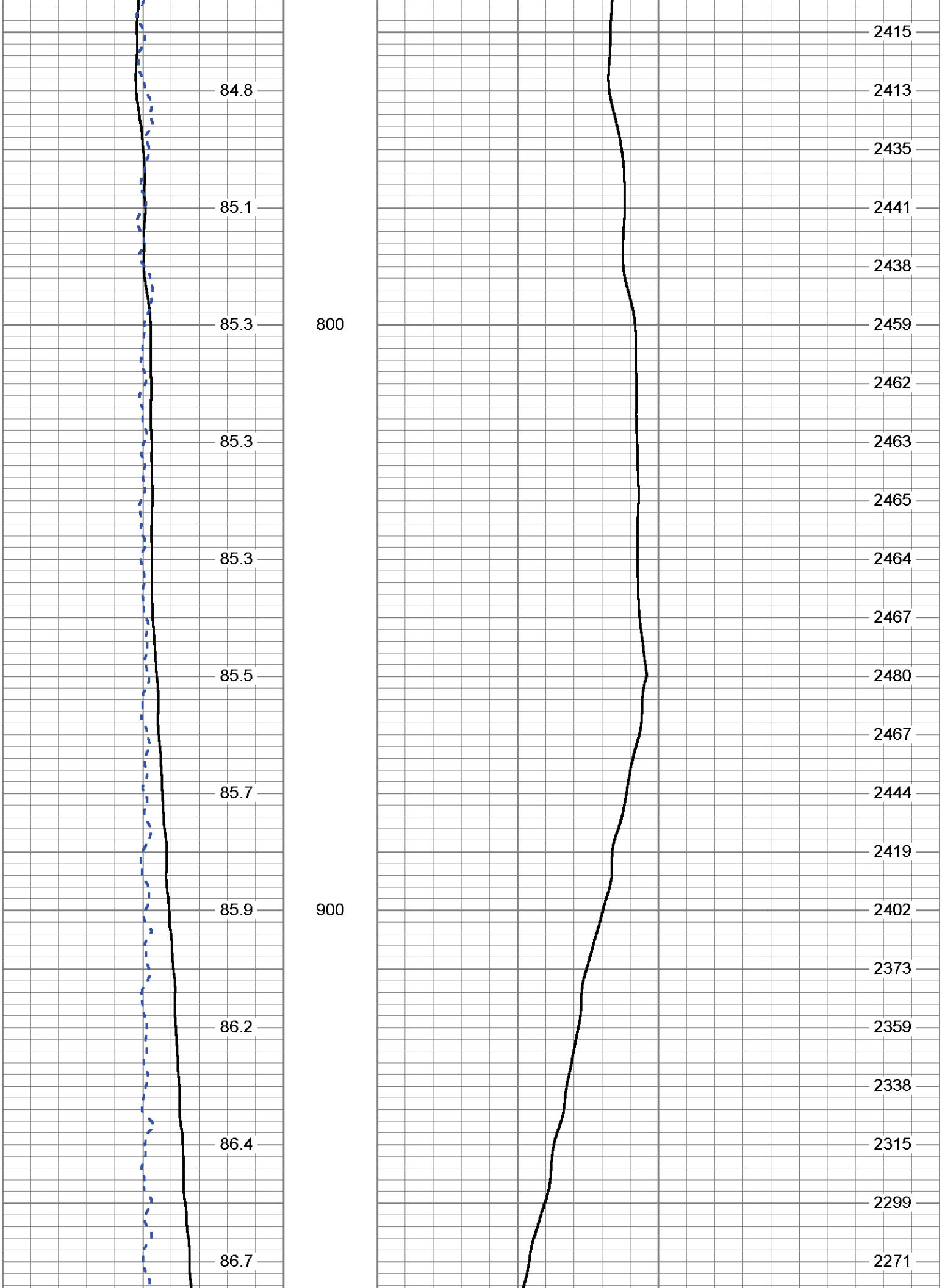
MV Geophysical

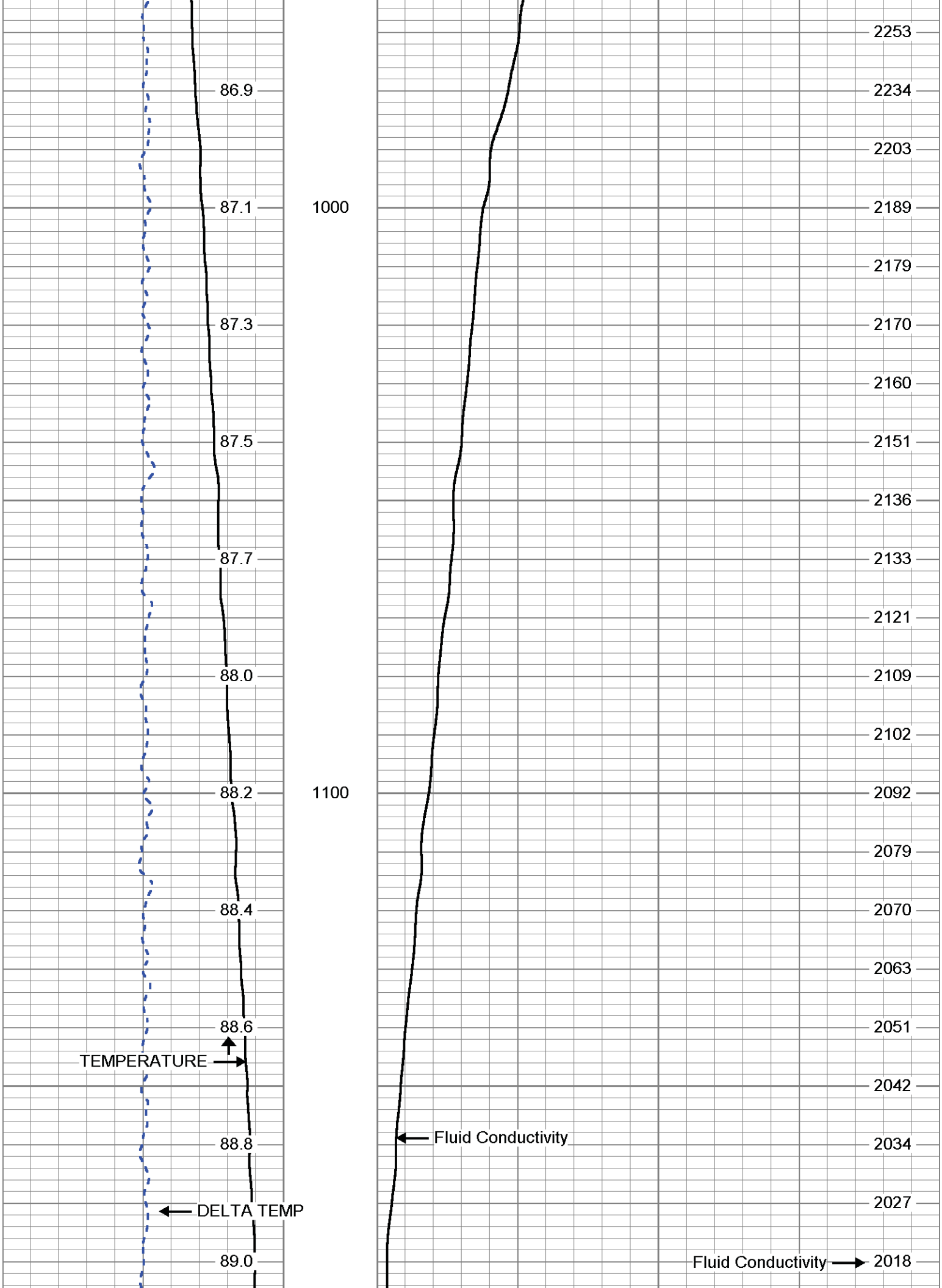
DYNAMIC FCT DOWN

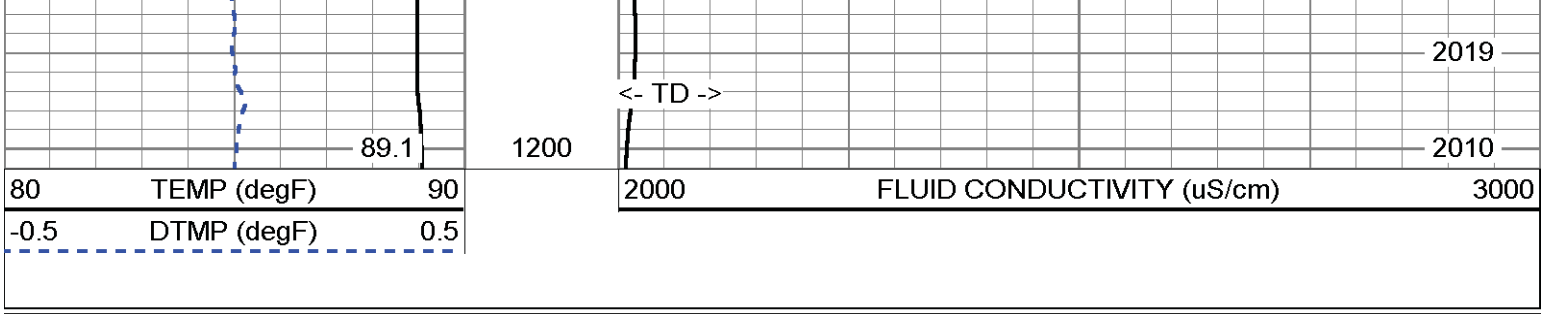
Database File: je1503.db
Dataset Pathname: run2/DFCT
Presentation Format: FCTJ1503
Dataset Creation: Mon Jun 06 18:59:46 2011
Charted by: Depth in Feet scaled 1:240




84.0
84.0
84.1
84.1
600
84.1
84.2
84.4
84.6
700
84.8
84.8
2341
2341
2341
2341
2344
2345
2345
2346
2346
2348
2353
2352
2346
2358
2379
2381
2379
2399
2412
2415
2415
2417


84.8
85.1
85.3
800
85.3
85.3
85.5
85.7
85.9
900
86.2
86.4
86.7
2415
2413
2435
2441
2438
2459
2462
2463
2465
2464
2467
2480
2467
2444
2419
2402
2373
2359
2338
2315
2299
2271

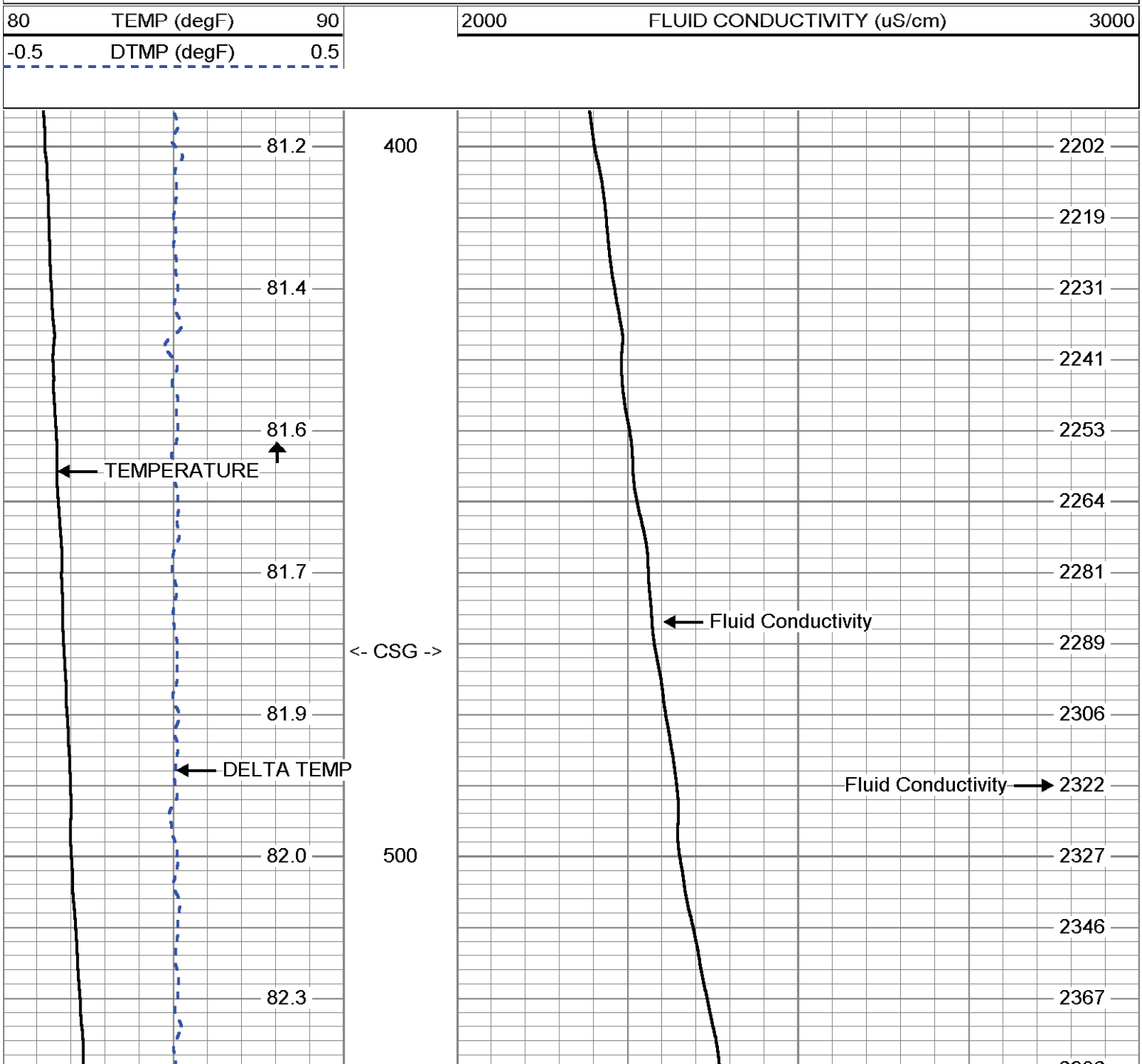

86.9
87.1
1000
87.3
87.5
87.7
88.0
88.2
1100
88.4
88.6
TEMPERATURE
88.8
DELTA TEMP
89.0
2253
2234
2203
2189
2179
2170
2160
2151
2136
2133
2121
2109
2102
2092
2079
2070
2063
2051
2042
Fluid Conductivity
2034
2027
Fluid Conductivity
2018

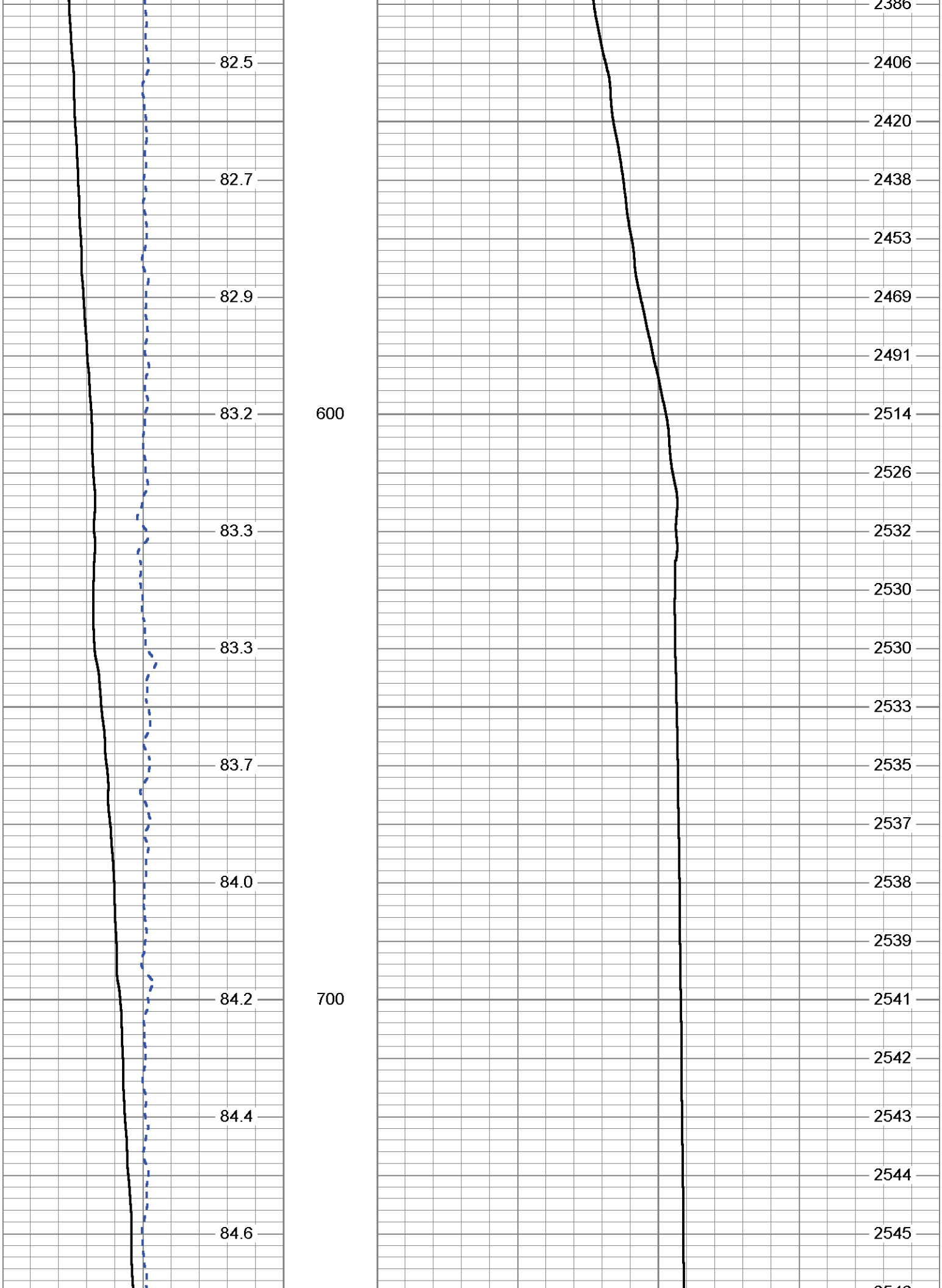


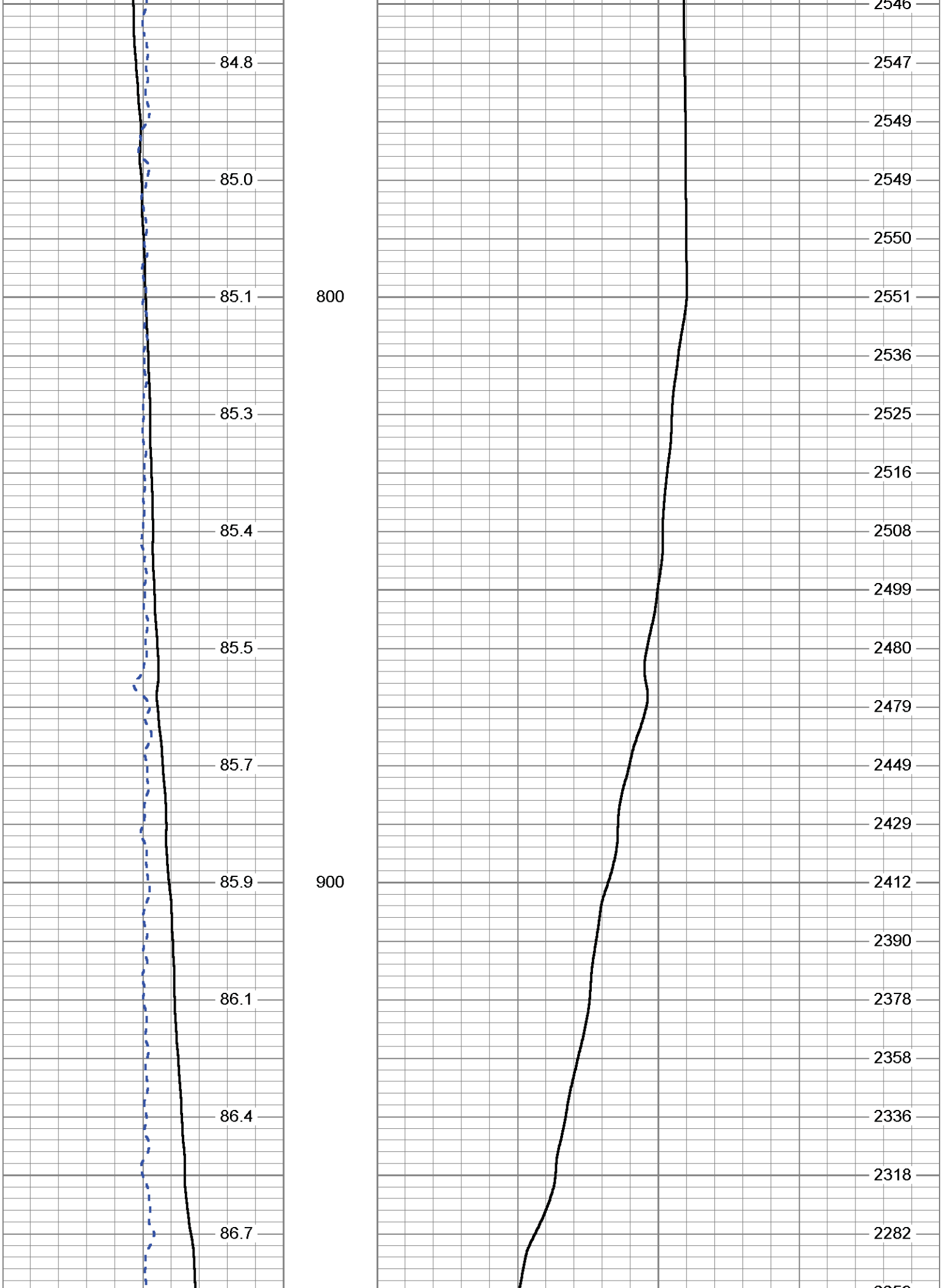
MV Geophysical

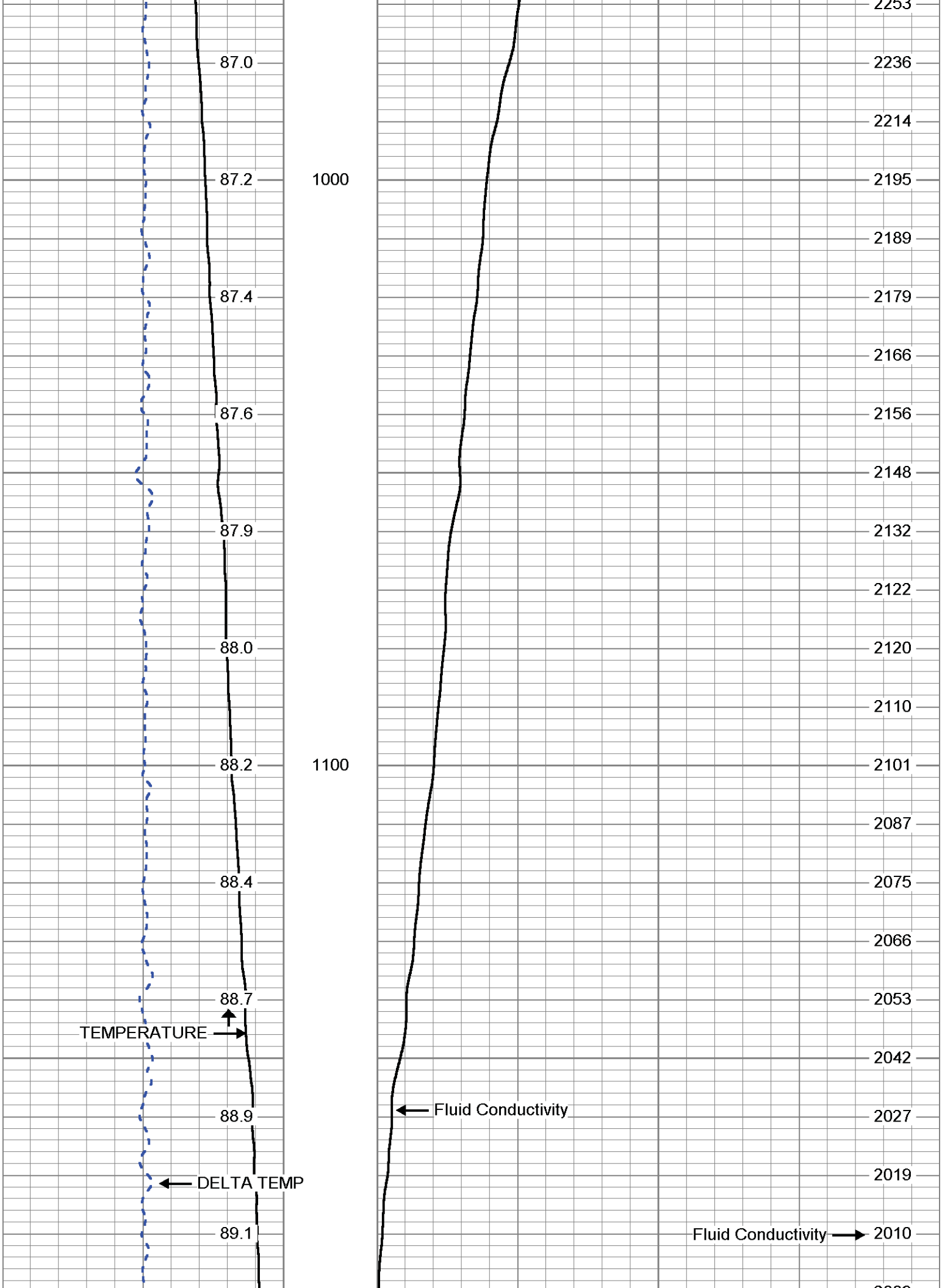
STATIC FCT DOWN

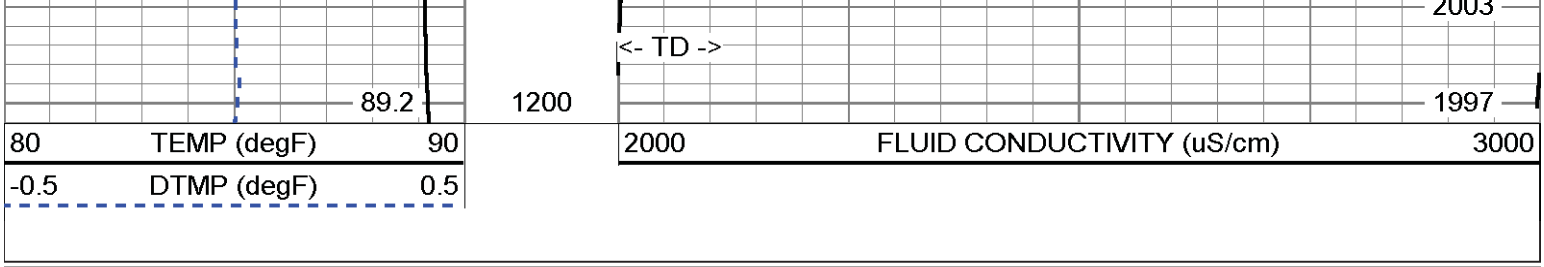
Database File: je1503.db
Dataset Pathname: run2/SFCT
Presentation Format: FCTJ1503
Dataset Creation: Mon Jun 06 10:57:09 2011
Charted by: Depth in Feet scaled 1:240

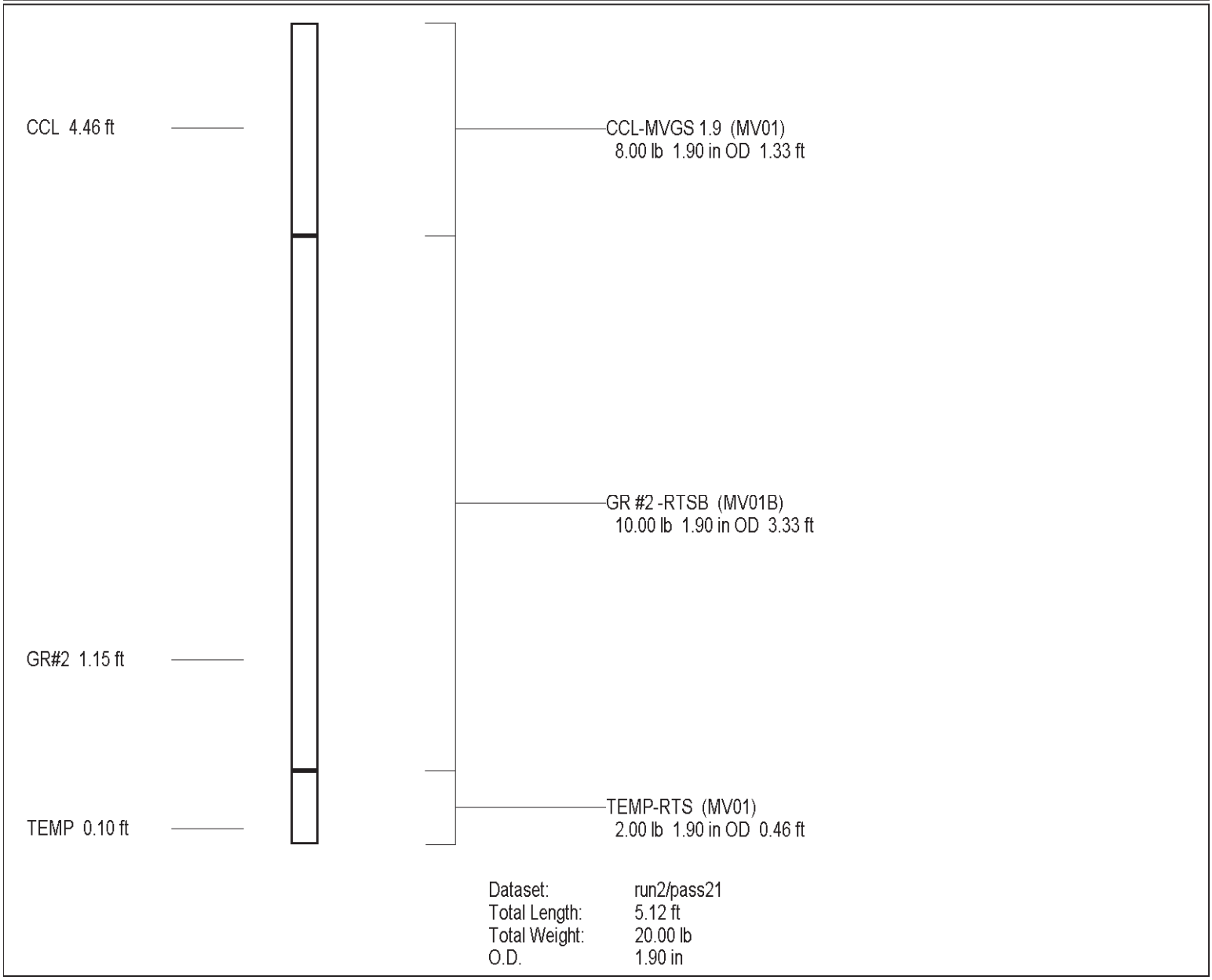



82.5
82.7
82.9
83.2
83.3
83.3
83.7
84.0
84.2
84.4
84.6
600
700
2386
2406
2420
2438
2453
2469
2491
2514
2526
2532
2530
2530
2533
2535
2537
2538
2539
2541
2542
2543
2544
2545


84.8
85.0
85.1
85.3
85.4
85.5
85.7
85.9
86.1
86.4
86.7
800
900
2546
2547
2549
2549
2550
2551
2536
2525
2516
2508
2499
2480
2479
2449
2429
2412
2390
2378
2358
2336
2318
2282


87.0
87.2
87.4
87.6
87.9
88.0
88.2
88.4
88.7
88.9
89.1
1000
1100
TEMPERATURE
DELTA TEMP
Fluid Conductivity
Fluid Conductivity
2253
2236
2214
2195
2189
2179
2166
2156
2148
2132
2122
2120
2110
2101
2087
2075
2066
2053
2042
2027
2019
2010


2003
<- TD ->
89.2
1200
1997
80
TEMP (degF)
90
2000
FLUID CONDUCTIVITY (uS/cm)
3000
-0.5
DTMP (degF)
0.5


CCL 4.46 ft
CCL-MVGS 1.9 (MV01)
8.00 lb 1.90 in OD 1.33 ft
GR #2 -RTSB (MV01B)
10.00 lb 1.90 in OD 3.33 ft
GR#2 1.15 ft
TEMP 0.10 ft
TEMP-RTS (MV01)
2.00 lb 1.90 in OD 0.46 ft
Dataset: run2/pass21
Total Length: 5.12 ft
Total Weight: 20.00 lb
O.D. 1.90 in

MV Geophysical

FLOWMETER LOG

Company Johnson Engineering, Inc.
Well JE1503
Field Babcock Ranch
County Charlotte
State/Prv Florida

Company	Johnson Engineering, Inc.
Well	JE1503
Field	Babcock Ranch
County	Charlotte
State/Prv.	Florida

Location
CCU/Babcock Ranch Test Well Project
Sec. 11 T41S R26E
LAT: 26 55' 29.6" N LONG: 81 41' 28.7" W

Other Services
XY/GR,DIL
FCT,FLOW
F.Samples

		Elevation
Permanent Datum	G.L.	
Log Measured From	G.L.	
Drilling Measured From	G.L.	

Elevation
K.B.
D.F.
G.L.

Date	6-JUN-2011		
Run Number	TWO		
Depth Driller	1200'		
Depth Logger	1194'		
Bottom Logged Interval	1194'		
Top Log Interval	400'		
Open Hole Size	6"		
Type Fluid	H2O		
Density / Viscosity	NA/NA		
Max. Recorded Temp.	see FCT log		
Estimated Cement Top	SURFACE		
Time Well Ready	09:30 6/6/2011		
Time Logger on Bottom	14:45 6/6/2011		
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller/C.Miller		
Witnessed By	L.Howard (JE)		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	9.625"	61'	470'				
TWO	6"	471'	1200'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	10"	10" ID	SURFACE	61'
Prot. String	6" PVC	6" ID	SURFACE	471'
Production String				
Liner				
Invoice No.	2011090	3x/10x/pdf/las	je1503.db	* FINAL PRINT *

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Comments

STATIC and DYNAMIC down passes were made at 52 fpm.

7 station performed.

Q =~160 gpm

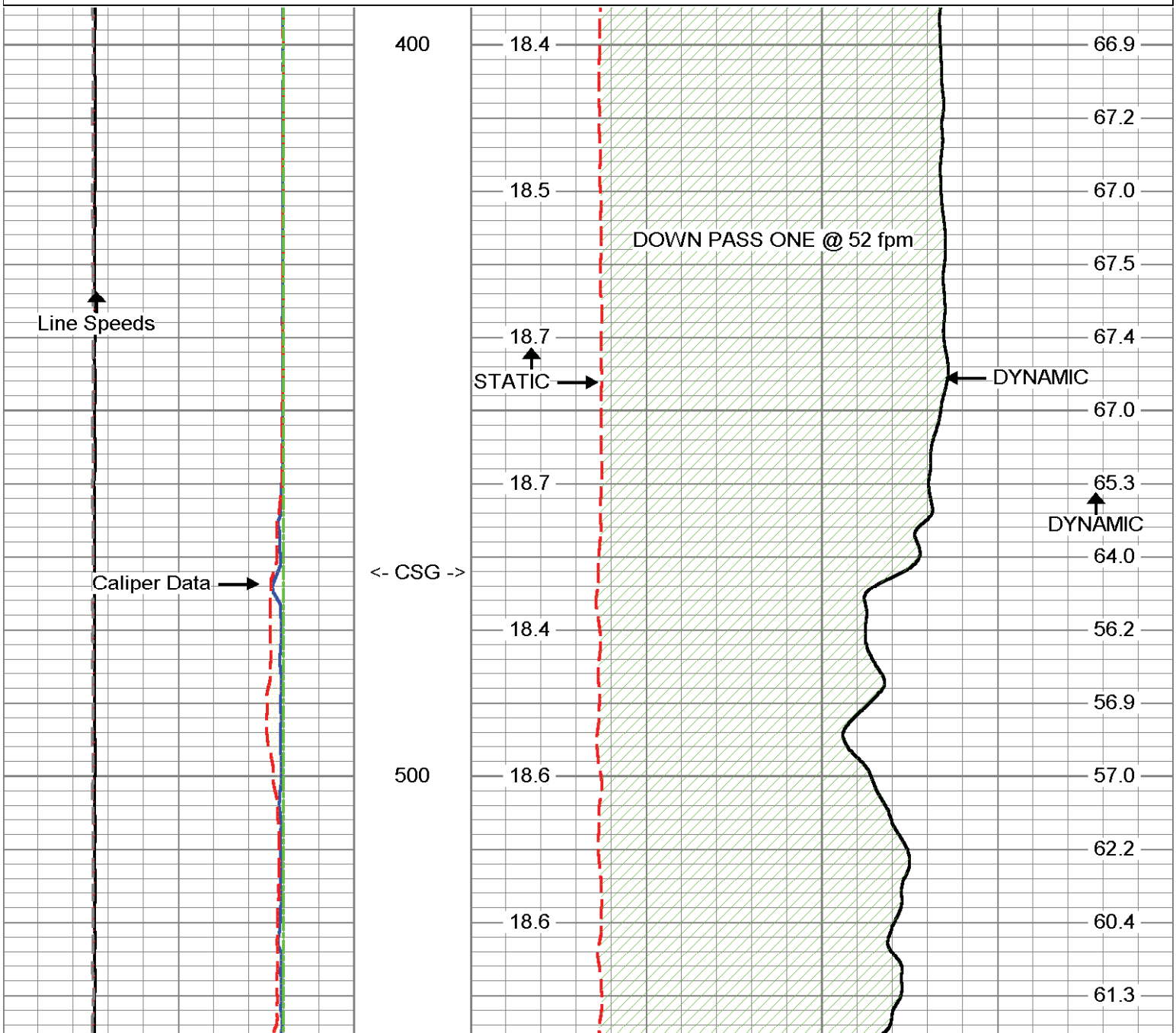
MV Geophysical

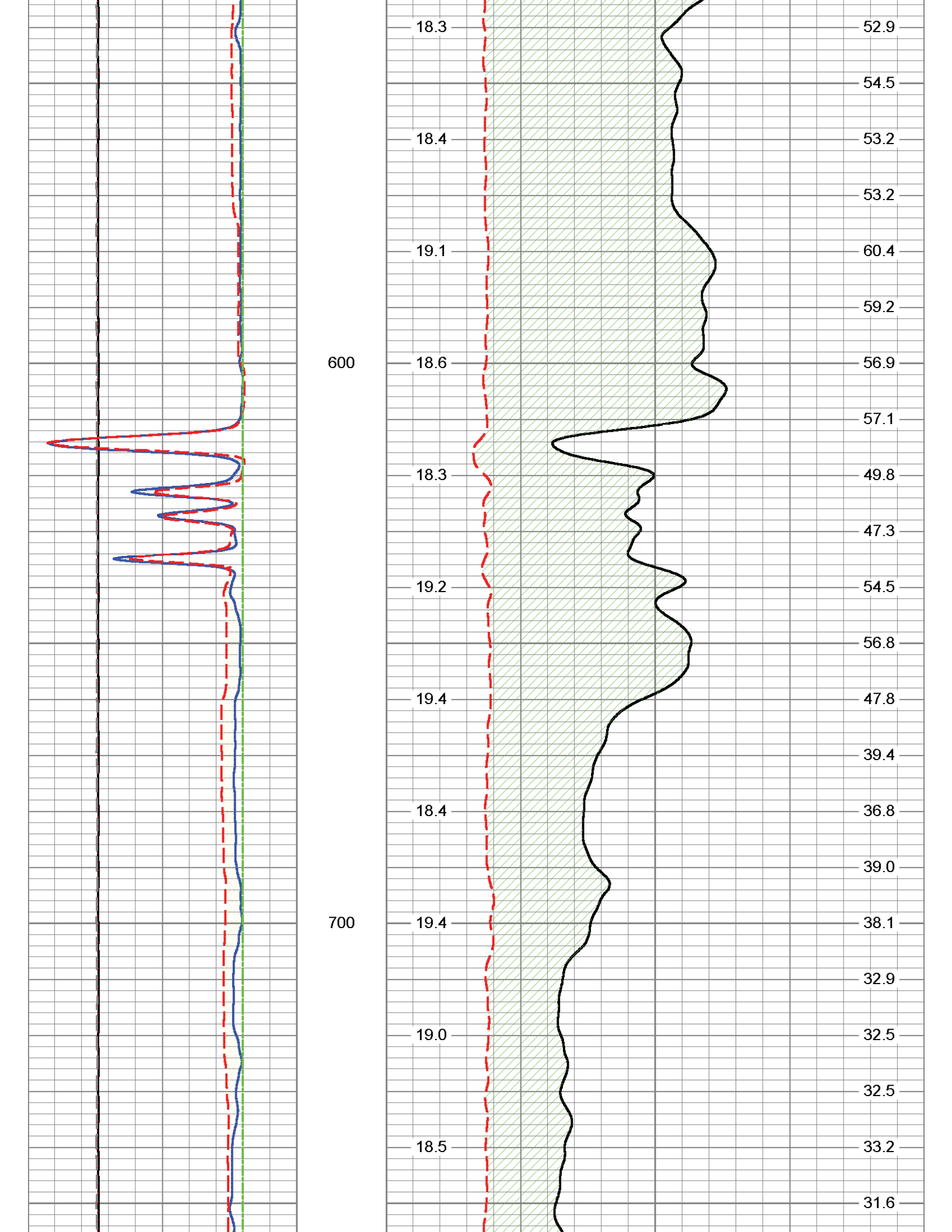
S/D DOWN @ 52 fpm

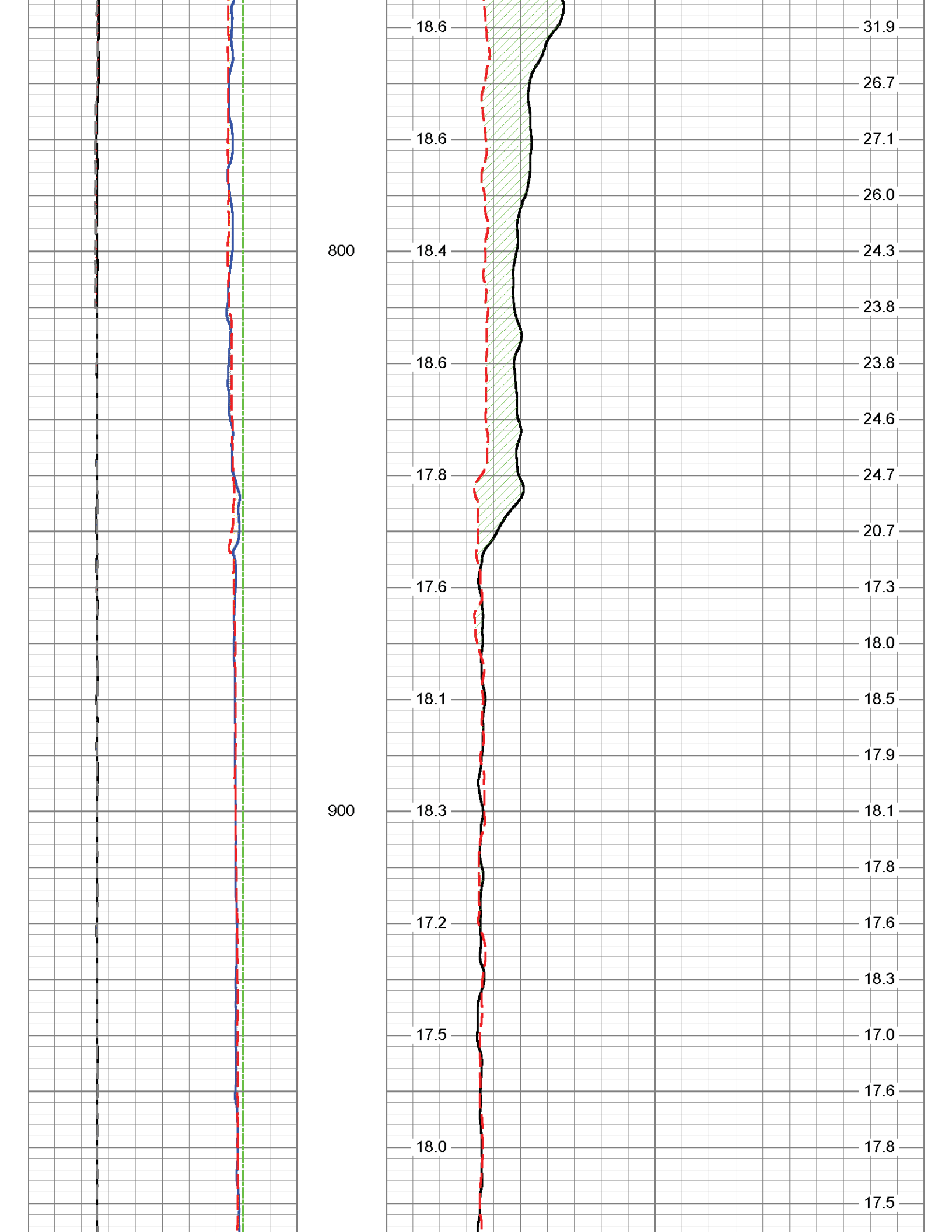
Database File:	je1503.db
Dataset Pathname:	run2/SD52
Presentation Format:	Q-JE1503
Dataset Creation:	Mon Jun 06 16:04:56 2011
Charted by:	Depth in Feet scaled 1:240

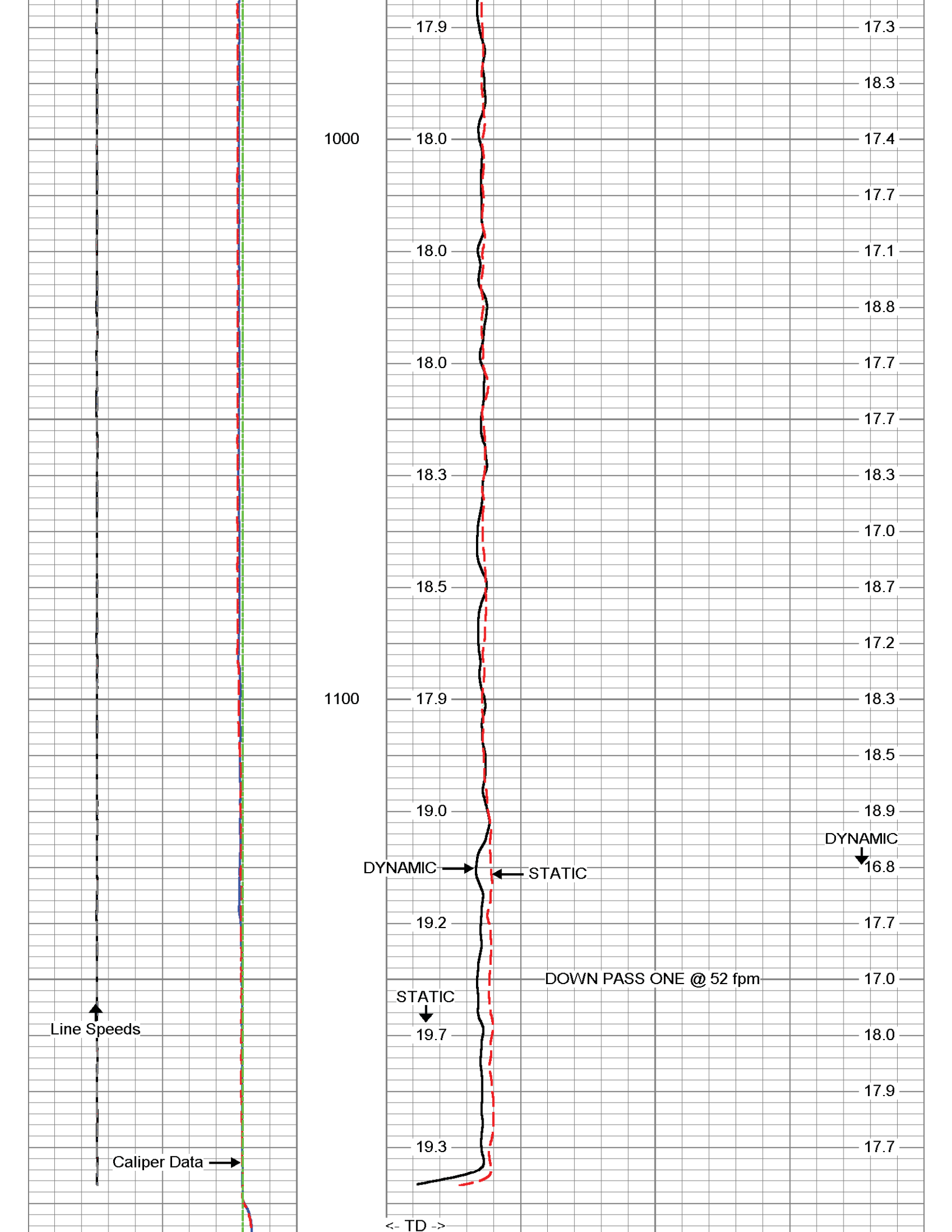
0	DYNAMIC LINE SPEED (ft/min)	00
0	STATIC LINE SPEED (ft/min)	200
30	X-CALIPER (in)	0
30	Y CALIPER (in)	0
30	BIT SIZE (in)	0

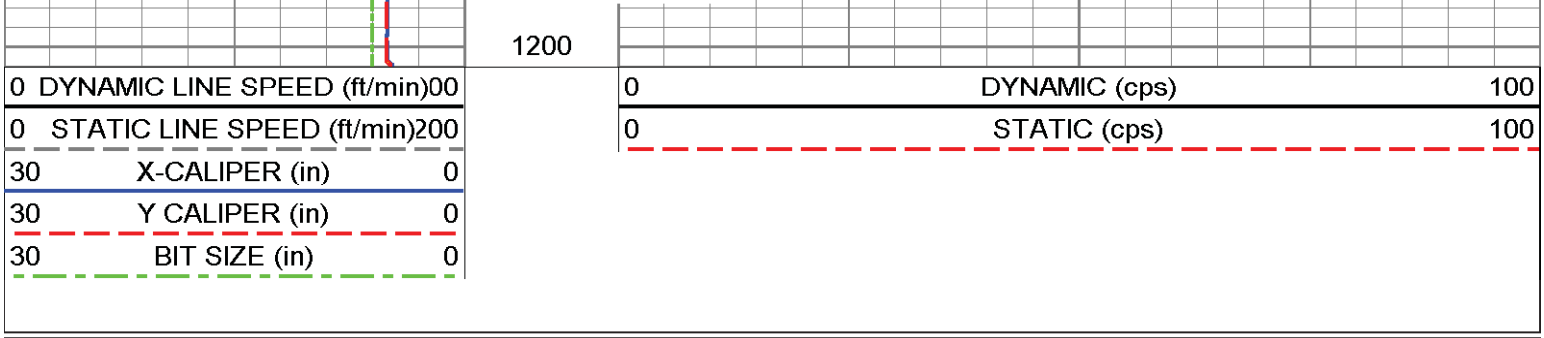
0	DYNAMIC (cps)	100
0	STATIC (cps)	100




18.3
52.9
54.5
18.4
53.2
53.2
19.1
60.4
59.2
600
18.6
56.9
57.1
18.3
49.8
47.3
19.2
54.5
56.8
19.4
47.8
39.4
18.4
36.8
39.0
700
19.4
38.1
32.9
19.0
32.5
32.5
18.5
33.2
31.6

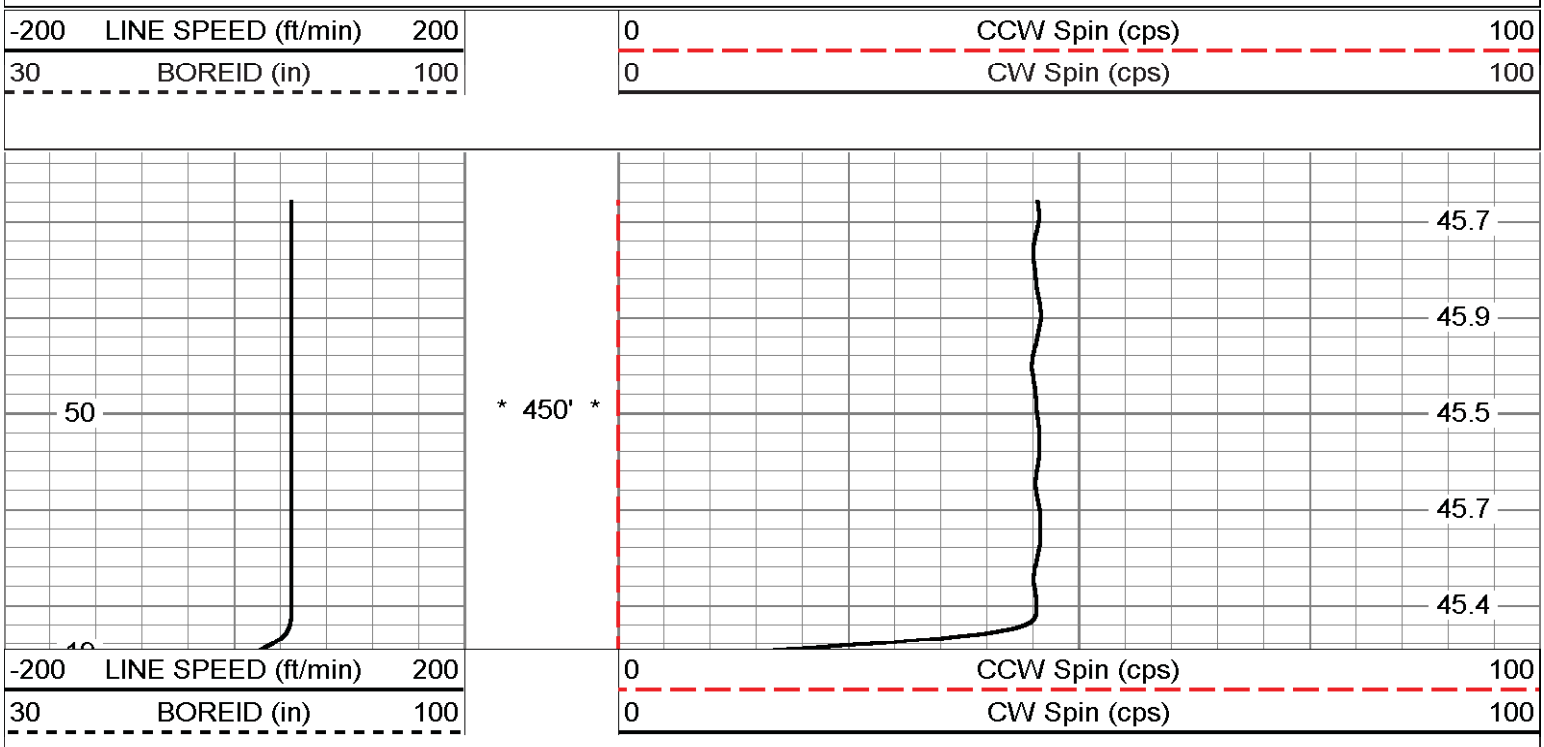

800
900
18.6
18.6
18.4
18.6
17.8
17.6
18.1
18.3
17.2
17.5
18.0
31.9
26.7
27.1
26.0
24.3
23.8
23.8
24.6
24.7
20.7
17.3
18.0
18.5
17.9
18.1
17.8
17.6
18.3
17.0
17.6
17.8
17.5


1000
1100
17.9
18.0
18.0
18.3
18.5
17.9
19.0
19.2
19.7
19.3
17.3
18.3
17.4
17.7
17.1
18.8
17.7
17.7
18.3
17.0
18.7
17.2
18.3
18.5
18.9
16.8
17.7
17.0
18.0
17.9
17.7
DYNAMIC
STATIC
DOWN PASS ONE @ 52 fpm
STATIC
DYNAMIC
Line Speeds
Caliper Data
<- TD ->



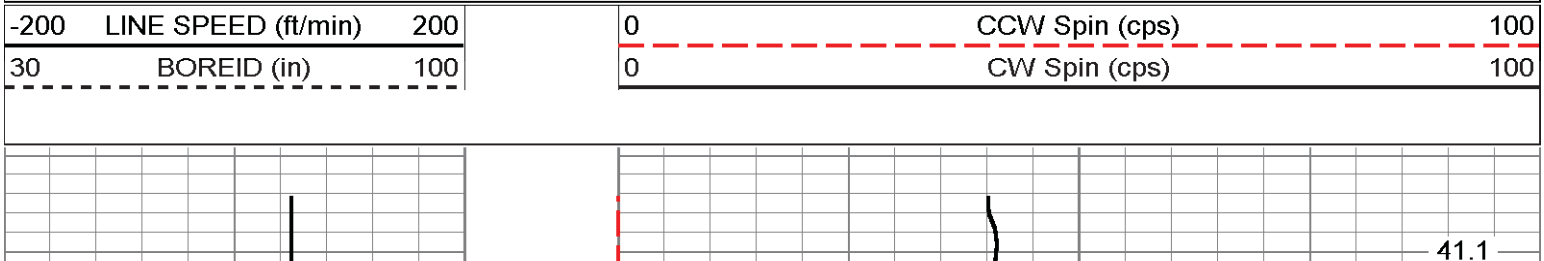
Station #7: 450'

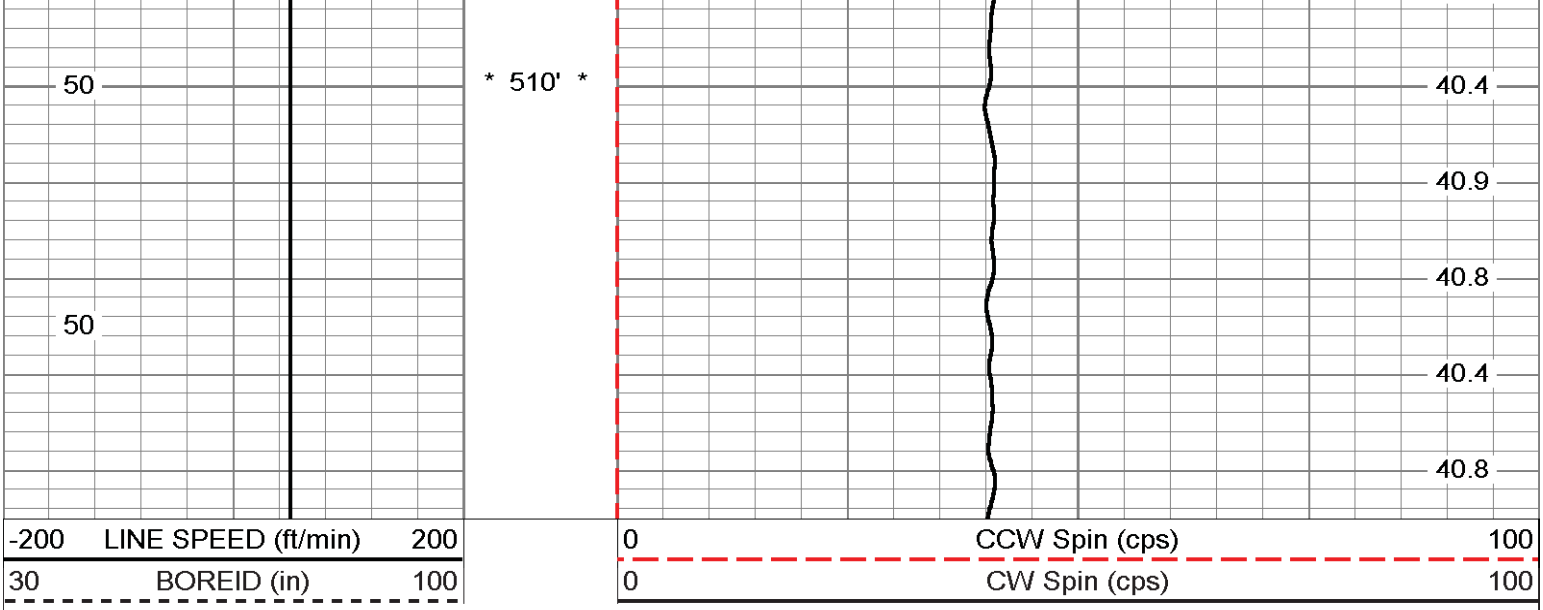
Database File: je1503.db
Dataset Pathname: run2/pass20
Presentation Format: FLOW
Dataset Creation: Mon Jun 06 16:43:05 2011 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240



Station #6: 510'

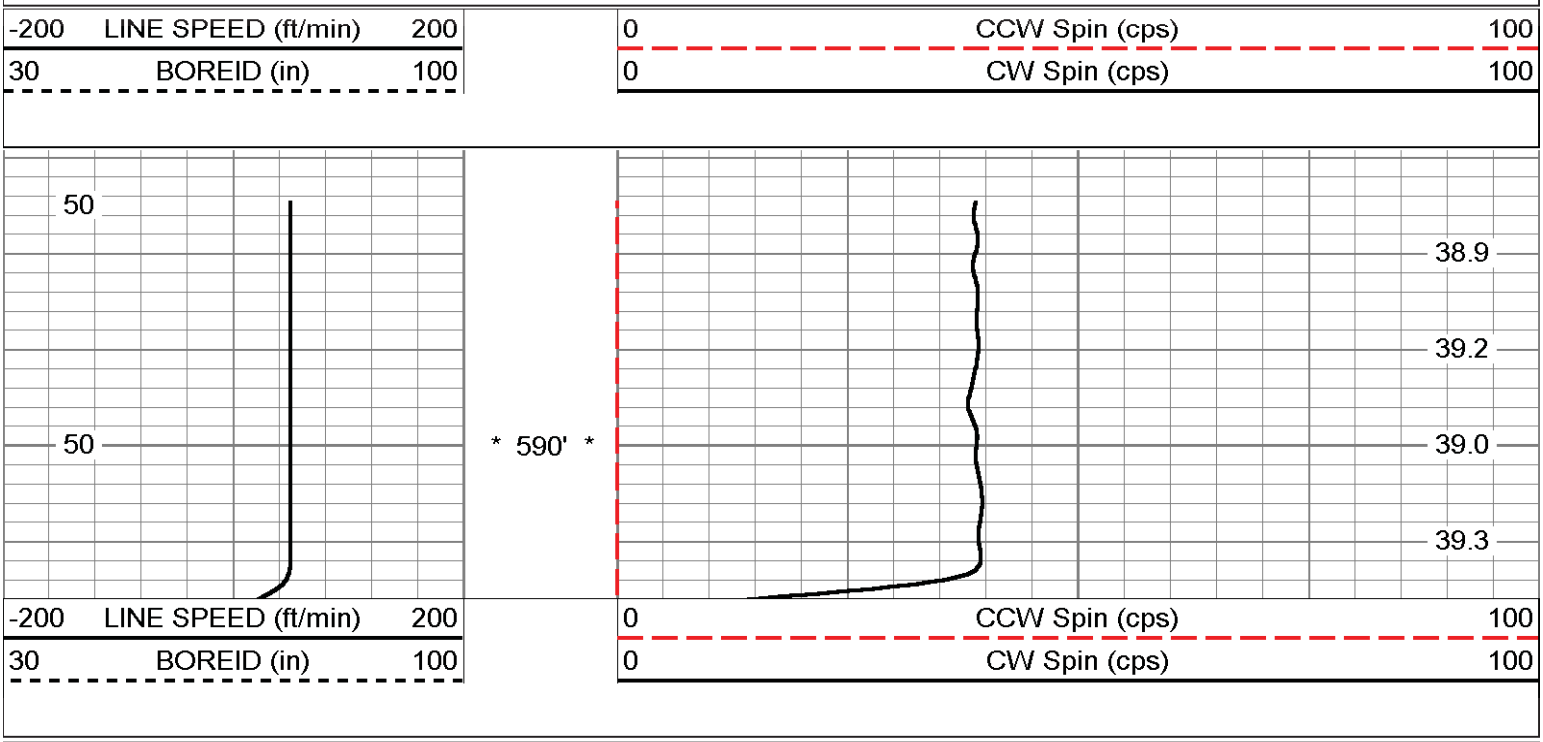
Database File: je1503.db
Dataset Pathname: run2/pass19
Presentation Format: FLOW
Dataset Creation: Mon Jun 06 16:40:28 2011 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240





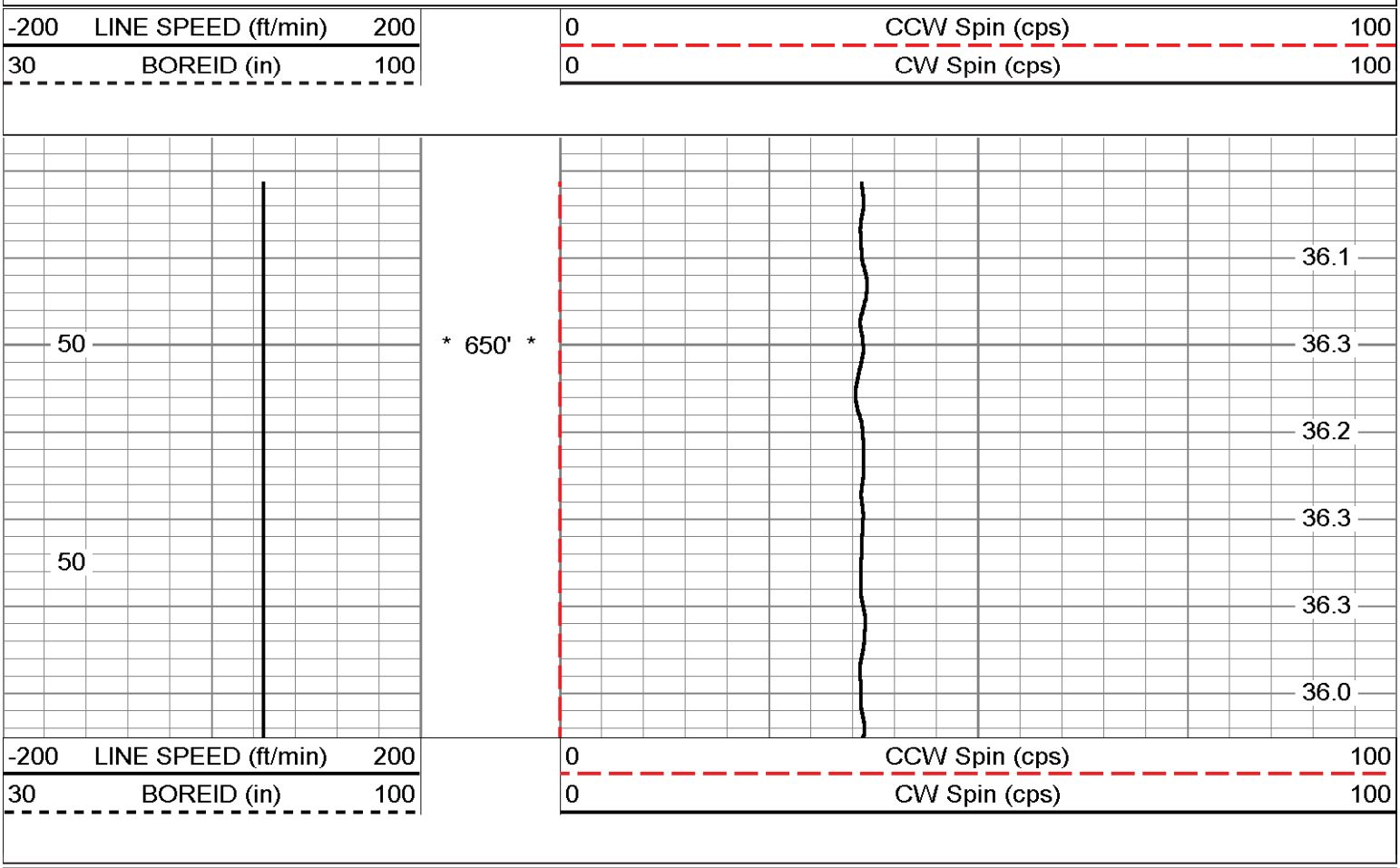
Station #5: 590'

Database File: je1503.db
Dataset Pathname: run2/pass18
Presentation Format: FLOW
Dataset Creation: Mon Jun 06 16:38:13 2011 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240



Station #4: 650'

Database File: je1503.db
Dataset Pathname: run2/pass17
Presentation Format: FLOW
Dataset Creation: Mon Jun 06 16:35:30 2011 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240



Station #3: 750'

Database File: je1503.db
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Presentation Format: FLOW
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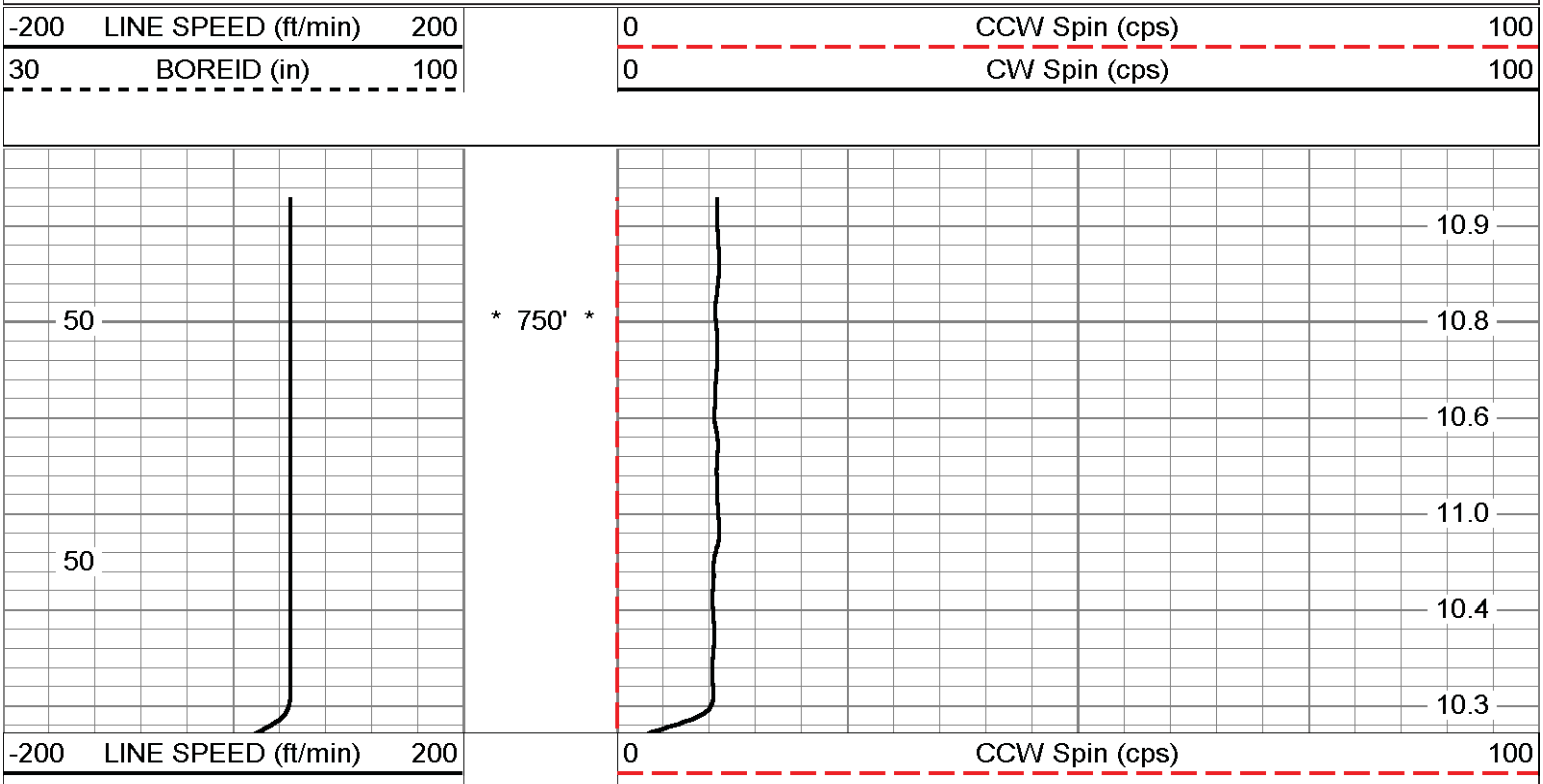


30 BOREID (in) 100

0 CW Spin (cps) 100

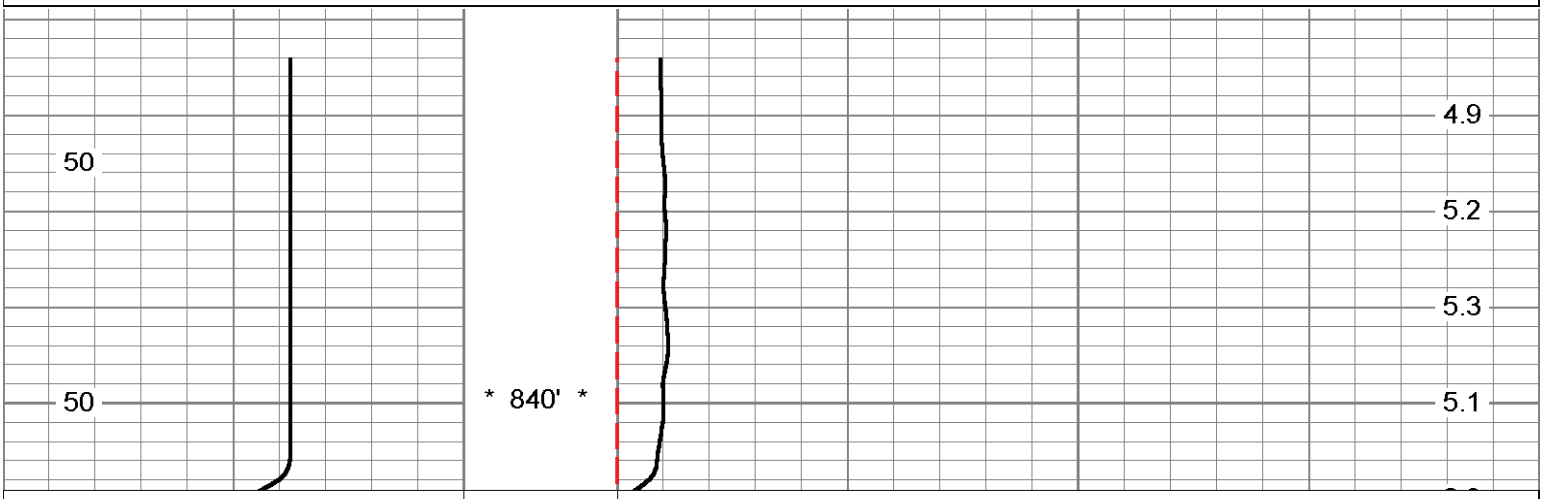
MV Geophysical

Station #2: 840'

Database File: je1503.db
Dataset Pathname: run2/pass15
Presentation Format: FLOW
Dataset Creation: Mon Jun 06 16:30:17 2011 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

-200 LINE SPEED (ft/min) 200
30 BOREID (in) 100

0 CCW Spin (cps) 100
0 CW Spin (cps) 100



-200 LINE SPEED (ft/min) 200
30 BOREID (in) 100

0 CCW Spin (cps) 100
0 CW Spin (cps) 100

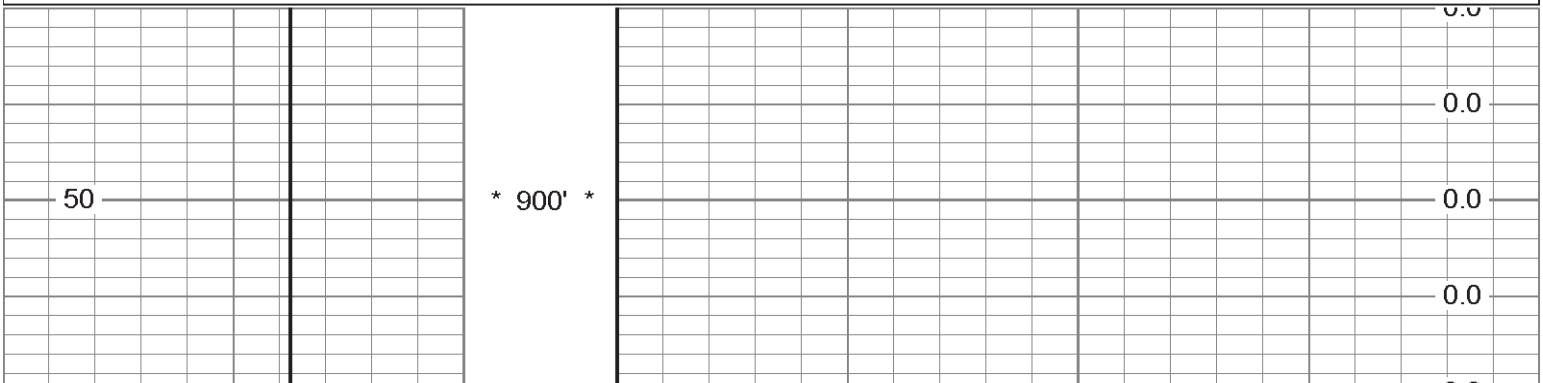
MV Geophysical

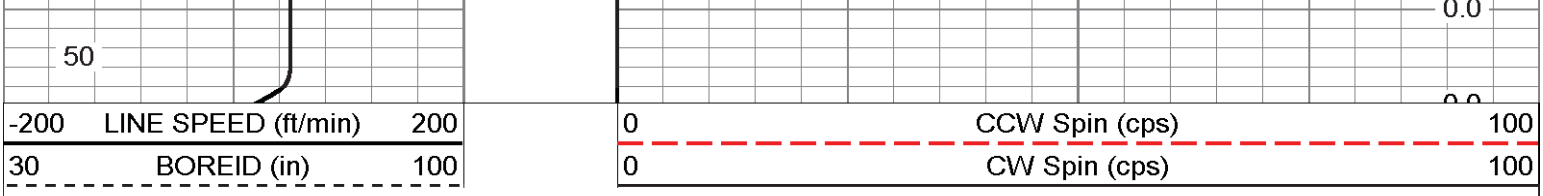
Station #1: 900'

Database File: je1503.db
Dataset Pathname: run2/pass14
Presentation Format: FLOW
Dataset Creation: Mon Jun 06 16:27:51 2011 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

-200 LINE SPEED (ft/min) 200
30 BOREID (in) 100

0 CCW Spin (cps) 100
0 CW Spin (cps) 100

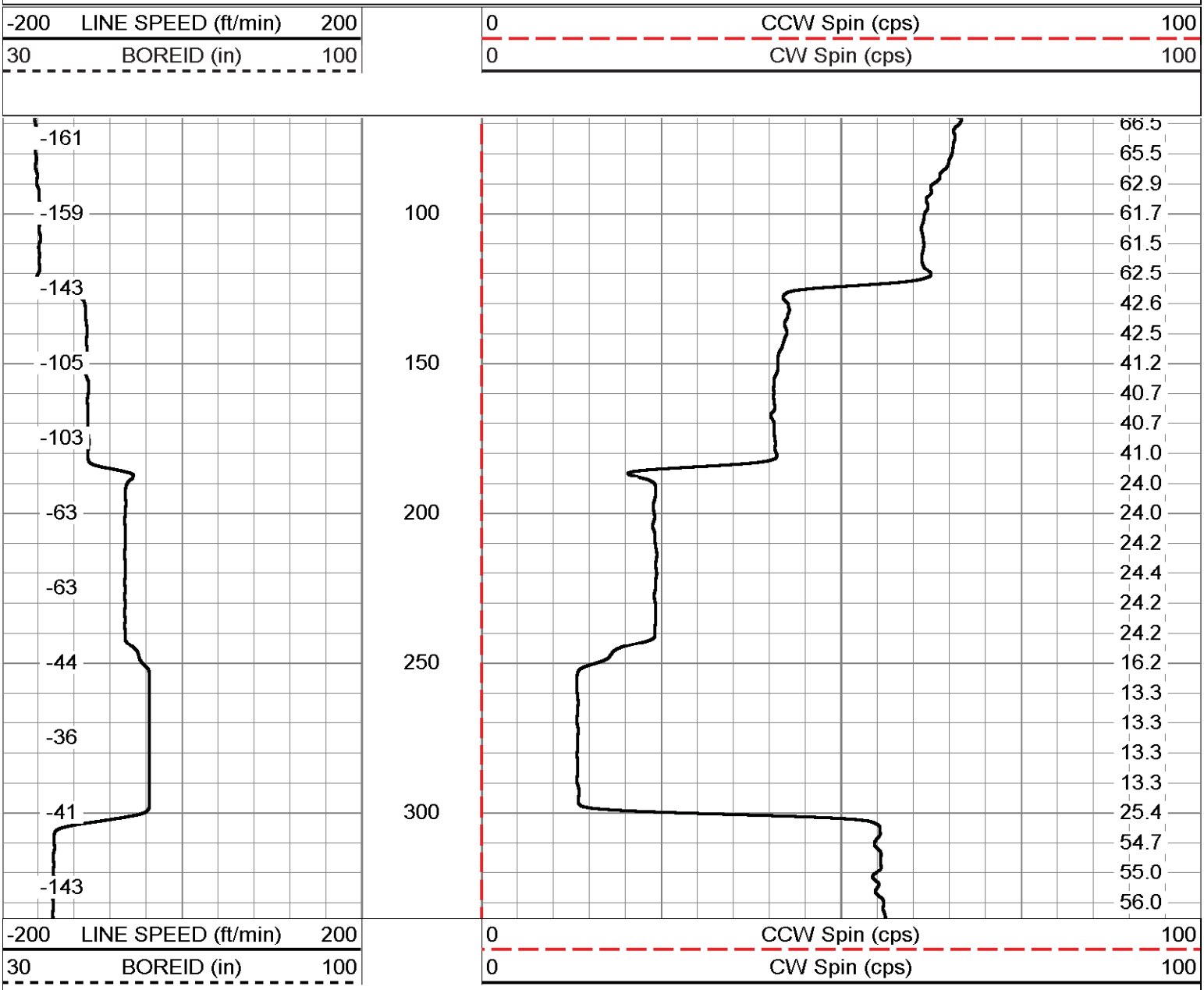


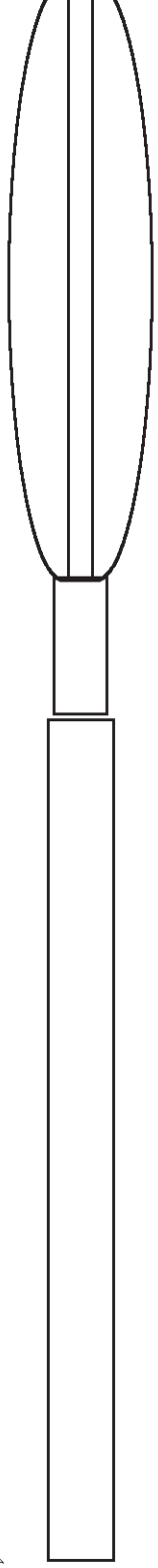


MV Geophysical

Q Calibration Down

Database File: je1503.db
Dataset Pathname: run2/pass12
Presentation Format: FLOW
Dataset Creation: Mon Jun 06 15:38:45 2011 by Log VER_5.3
Charted by: Depth in Feet scaled 1:600





CENT-5FOOTSB (5FTSB)
50.00 lb 1.69 in OD 5.00 ft

FLOW-LARGE (65)
35.00 lb 3.75 in OD 4.80 ft

FLOWP 0.00 ft
FLOWN 0.00 ft

Dataset:	run2/pass12
Total Length:	9.80 ft
Total Weight:	85.00 lb
O.D.	3.75 in

Appendix H

JOHNSON ENGINEERING

SINCE 1946

August 23, 2011

Karin A. Smith, P.G.
Water Use Regulation Division
South Florida Water Management District
P.O. Box 24680
West Palm Beach, FL 33416-4680

RE: Request for Additional Information
Water Use Permit Application No. 071101-3
Project: Charlotte County Babcock Ranch Water Supply
County: Charlotte Sec 3,10,12,14,15/Twp 41S/R 26E

Dear Ms. Smith,

This letter is in response to your August 4, 2010 letter requesting additional information.

1. Please complete a monitor well and then submit lithologic and water quality information at various depths at the wellfield site that demonstrates that the production horizon is from a single aquifer system, pursuant to Rule 40E- 3.502(1)(FAC).

Response:

Johnson Engineering constructed three monitor wells in the Surficial, Intermediate and Upper Floridan aquifers, in accordance with the drilling and testing program that was provided to the SFWMD on April 21, 2011. The Surficial aquifer well (JE-1502) has casing set to 13 feet below land surface (bls) and a screened interval from 13 to 21 feet bls. The Intermediate aquifer well (JE-1501) has casing set to 62 feet bls and an open hole interval to 240 feet bls. The Upper Floridan aquifer well (JE-1503) has casing set to 470 feet bls and an open hole interval to 1,200 feet bls, as requested by the SFWMD. Well completion reports were provided to the SFWMD on July 11, 2011.

During well construction, well cuttings were collected and described at 10-foot intervals or at major changes in lithology. See attached lithologic log for a description of the lithology for Upper Floridan aquifer well JE-1503. Based on the lithology encountered during construction of JE-1503, the first major production zone of the Upper Floridan aquifer does not occur until approximately 650 feet bls at this location. A suite of static and dynamic geophysical logs, including caliper, natural gamma, dual induction, fluid resistivity, flow and temperature, for JE-1503 support this depth as the first appreciable production zone. See attached geophysical logs included in electronic format on the CD provided with the reviewer's copy of this response. The geophysical logs show flow zones at approximately 514-520, 655-670, 690-710, 755-772, 788-800 and 845-855 feet bls. As a

2122 Johnson Street ▪ Post Office Box 1550 ▪ Fort Myers, Florida 33902-1550
(239) 334-0046 ▪ Fax (239) 334-3661

result, the proposed depths of the production wells have been modified to cased depths of 660 feet bls and total depths of 900 feet bls. Additionally, due to the reduction in allocation requested and the hydraulic properties of the aquifer, as discussed below, the total number of proposed production wells has been decreased to 3 primary production wells. Please see attached revised table A and wellfield location map.

Following completion of test well construction, Johnson Engineering conducted a 72-hour constant rate aquifer performance test (APT) using JE-1503 as the pumping well and existing Lower Hawthorn aquifer well JE-585 as the observation well. JE-585 is located approximately 802 feet from the test well site, and cased to approximately 270 feet BLS and open to 551 feet bls. Water level data recorded at JE-585 and JE-1503 before, during and after the APT show good hydraulic communication between these wells, despite the different cased and total depths. Data from the SWFWMD's ROMP 5 site, located approximately 7 miles west of the test site, similarly show nearly identical water levels for the Arcadia (450-600 feet bls) and Suwannee (720-970 feet bls) monitor zones.

The Surficial aquifer (JE-1502), Intermediate aquifer (JE-1501) and Upper Floridan aquifer (JE-1503) test/monitor wells, along with JE-585, were equipped with pressure transducers and dataloggers to monitor water levels before, during and after the pumping portion of the APT. Background data was collected for over 5 days prior to the start of the APT, which involved pumping JE-1503 at 125 gpm for 72 hours. Collection of recovery data continued for 6 days following completion of the pumping portion of the test. During the APT, water levels in JE-1503 declined by approximately 4.5 feet, for a specific capacity of 27.8 gallons per minute per foot (gpm/ft). Water levels measured in JE-585 declined by approximately 0.6 feet during the APT. Water levels measured in the Surficial aquifer well, JE-1502, rose during the APT due to storage of water generated by the APT proximate to the monitor well. See attached hydrographs of water level during the APT for the 4 wells.

Drawdown data from JE-585 were analyzed using a Hantush and Jacob (1955) leaky aquifer solution. The data analysis produced a transmissivity value of 11,440 feet squared per day, a storage coefficient value of $1.1e^{-3}$, and a leakance value of $7.1e^{-4}$ per day. Please see attached APT data curve matching analysis. Analysis of recovery data from JE-1503 using the Theis (1946) recovery solution produced a similar transmissivity value of 12,560 feet squared per day. These values also agree well with those measured at the Town and Country Utilities (TCUC; SFWMD #08-00122-W) APT site. Testing at the TCUC wellfield, approximately 4 miles to the south of the Charlotte County Utilities site, reported a transmissivity value of 10,800 feet squared per day, a storage coefficient value of $1.56e^{-4}$, and a leakance value of $2.1e^{-4}$ per day.

A single-layer WINFLOW model using the site-specific aquifer parameters described above and a Hantush and Jacob (1955) leaky aquifer solution was used to evaluate potential drawdown due to withdrawal of the requested allocation from the Upper Floridan aquifer. The model simulates maximum daily withdrawals of 3 mgd from 3 Upper Floridan aquifer wells for 90 days without rainfall recharge. Please see attached for revised modeled drawdown. Based on results from the revised modeling, the 1-foot drawdown contour created by withdrawing the requested allocation from the Charlotte County Utilities wellfield may intersect Lower Hawthorn/Upper Floridan aquifer uses at the East Charlotte

Drainage District (#2689) and Lady Moon Farms (#9648) within the SWFWMD. The SWFWMD lists the source for the East Charlotte Drainage District and Lady Moon Farms as from the Intermediate Aquifer System. However, these permitted users were included in the cumulative impact model because the listed well construction details are similar to those of JE-585, which shows hydraulic connectivity with Upper Floridan test well JE-1503.

Additionally, six Babcock Ranch Lower Hawthorn/Upper Floridan aquifer wells (SFWMD #08-00132-W) were also included in the cumulative impact model. These wells include:

A5-2 (JE-584)
B6-1 (JE-588)
B6-4 (JE-704)
C4-2 (JE-614)
D3-1 (JE-618)
D4-2 (JE-613)

Most of these wells are listed as secondary or standby facilities and do not have rated capacities. All wells, with the exception of D3-1, were simulated using a conservative pumping rate of 1 mgd each. The model simulated withdrawals of 72,000 gpd from D3-1 due to the small diameter and low measured yield of that well. Withdrawals by the Town and Country Utilities public supply wellfield (SFWMD #08-00122-W) were also included in the model as a large nearby user in the Upper Floridan aquifer, although the 1-foot drawdown contours of the two projects do not intersect. Please refer to the attached table of users included in the cumulative impact model for number of wells and withdrawal rates. The model simulated withdrawal rates for the facilities permitted through the SWFWMD based on the peak day allocations assigned for each facility, as obtained from the SWFWMD web site.

Please refer to the attached figure of cumulative drawdown. The cumulative impact model results indicate that up to 20 feet of drawdown may occur at some of the East Charlotte Drainage District wells. Based on the lowest recorded water level of 45.8 feet, NGVD measured at ROMP 5 (Suwannee) and a top of aquifer depth of -396 feet, NGVD (450 feet bls), 421.8 feet of potentiometric head will remain above the top of the aquifer. Model input and output files in electronic format have been provided on a CD attached to the reviewer copy of this response.

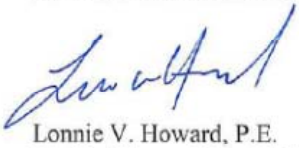
During drilling via reverse-air circulation method, water quality samples were collected at 40-foot intervals and analyzed for dissolved chloride, total dissolved solids (TDS), sulfate and specific conductance. See attached graph and lab reports for results. Additionally, at the time of geophysical logging, water quality samples were collected at specified depths in the borehole using a bailer. Prior to sampling, the well had been shut in for at least 5 days, allowing for representative sampling of native water quality from a specific interval. See attached plot and lab report for results. The water quality results indicate that salinity of the native groundwater peaks around 800 feet bls, with chloride and TDS of approximately 600 and 1,500 milligram per liter (mg/L), respectively, and then becomes fresher with depth, with chlorides and TDS declining below 500 and 1,300 mg/L, respectively, by 1,200

feet. No appreciable flow zones exist from approximately 860 to 1,200 feet bls. The targeted production zone is, therefore, separated from deeper, saline production zones by at least 300 feet of confinement with fresher water quality than that of the production zone.

Should you have any questions or comments, please do not hesitate to contact me at (239) 334-0046.

Sincerely,

JOHNSON ENGINEERING, INC.



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Florida License No. 53167
Johnson Engineering, Inc.
2122 Johnson Street
Fort Myers, FL 33901
(239) 334-0046
E B #642

Kim Arnold, P.G.
Florida License No. 2565
Johnson Engineering, Inc.
2122 Johnson Street
Fort Myers, FL 33901
(239) 334-0046
G B #503

Enclosure

Cc: Terri Couture, Charlotte County Utilities
Bruce Bullert, P.E., Charlotte County Utilities
File 20118669-001

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JOHNSON ENGINEERING

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FORT MYERS, FLORIDA 33902-1550
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FAX (239) 334-3661
E.B. #642 & L.B. #642

Charlotte County Utilities
Babcock Ranch Upper Floridan Aquifer Wellfield

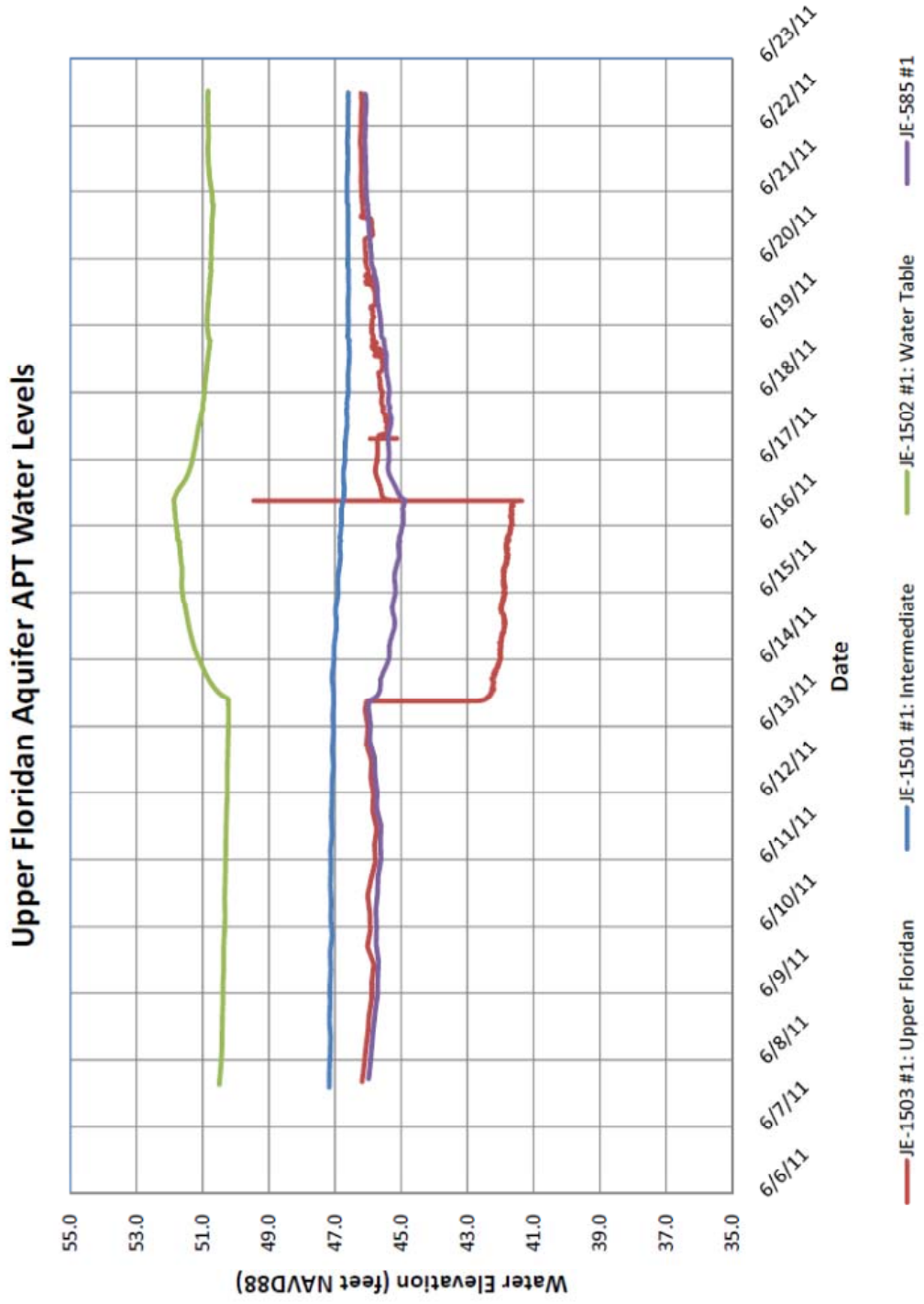
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

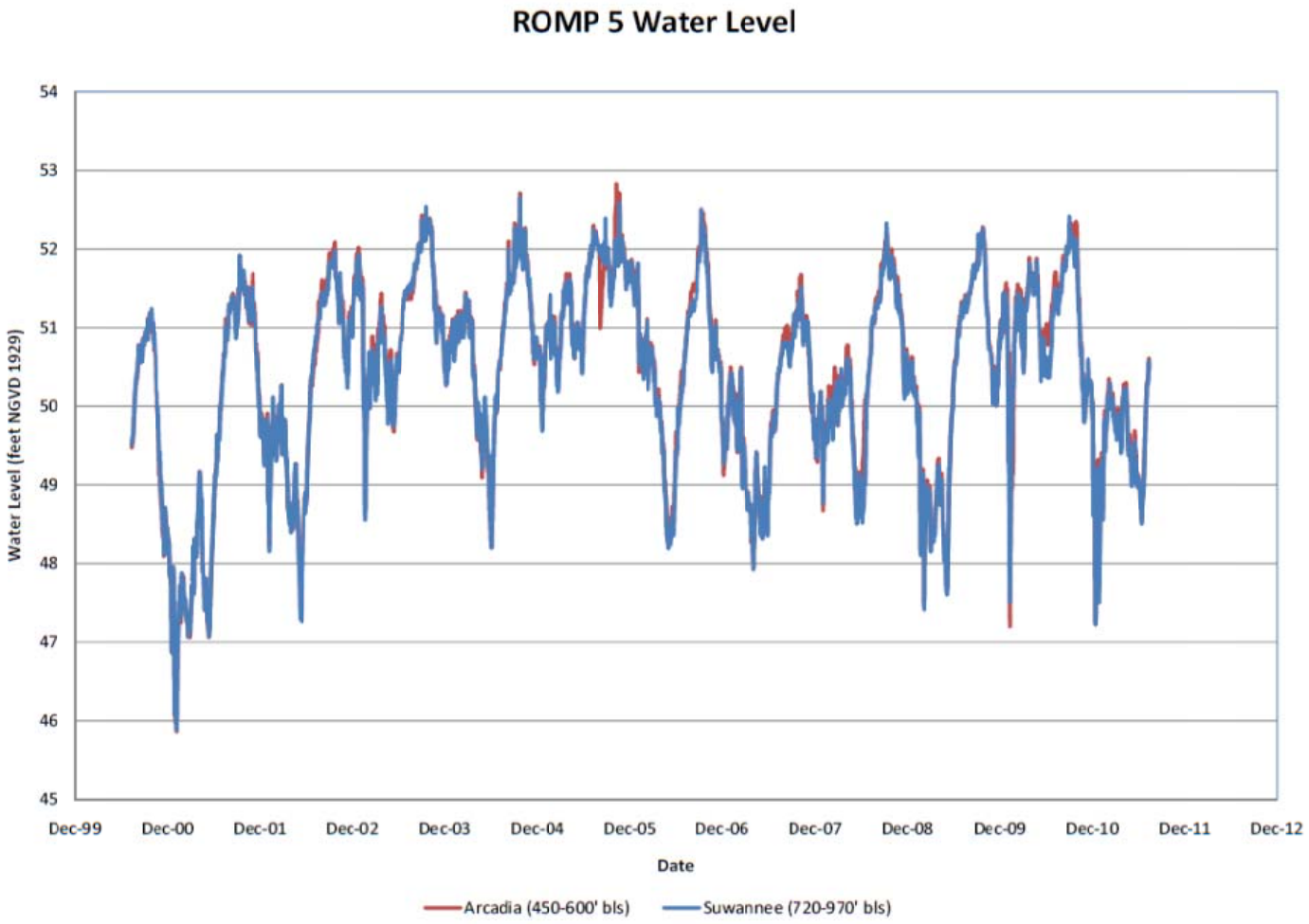
TABLE A
Description of Wells

Well Name or Number (SFWMD Facility ID #)	PW-1	PW-2	PW-3	
Map Designation	PW-1	PW-2	PW-3	
Existing or Proposed	Proposed	Proposed	Proposed	
Proposed Construction Date	2015	2015	2015	
Date Installed if Existing				
Diameter (in)	14	14	14	
Total Depth (ft)	900	900	900	
Cased Depth (ft)	660	660	660	
Screened Interval (ft)	N//A	N//A	N//A	
Pumped or Flowing	Pumped	Pumped	Pumped	
Pump Type (see Instructions)	Line shaft turbine	Line shaft turbine	Line shaft turbine	
Pump Intake Depth (ft NGVD)	-100	-100	-100	
Pump or Flow Capacity (GPM)	1,500	1,500	1,500	
Working Valve if Artesian (yes, no or not applicable)	Yes	Yes	Yes	
Status (see Instructions)	Secondary	Secondary	Secondary	
Purpose (see Instructions)	PWS	PWS	PWS	
Elevation of the Wellhead (ft NGVD – see Instructions)	56	56	56	
Water Use Accounting Method (see Instructions)	flowmeter	flowmeter	flowmeter	
Date Last Calibrated (ATTACH calibration report)				
Planar Coordinates (if known – see Instructions)	429590 E 949811 N	429545 E 947662 N	429488 E 945666 N	
Section / Township / Range	3/41/26	3/41/26	3/41/26	

sfwmd.gov

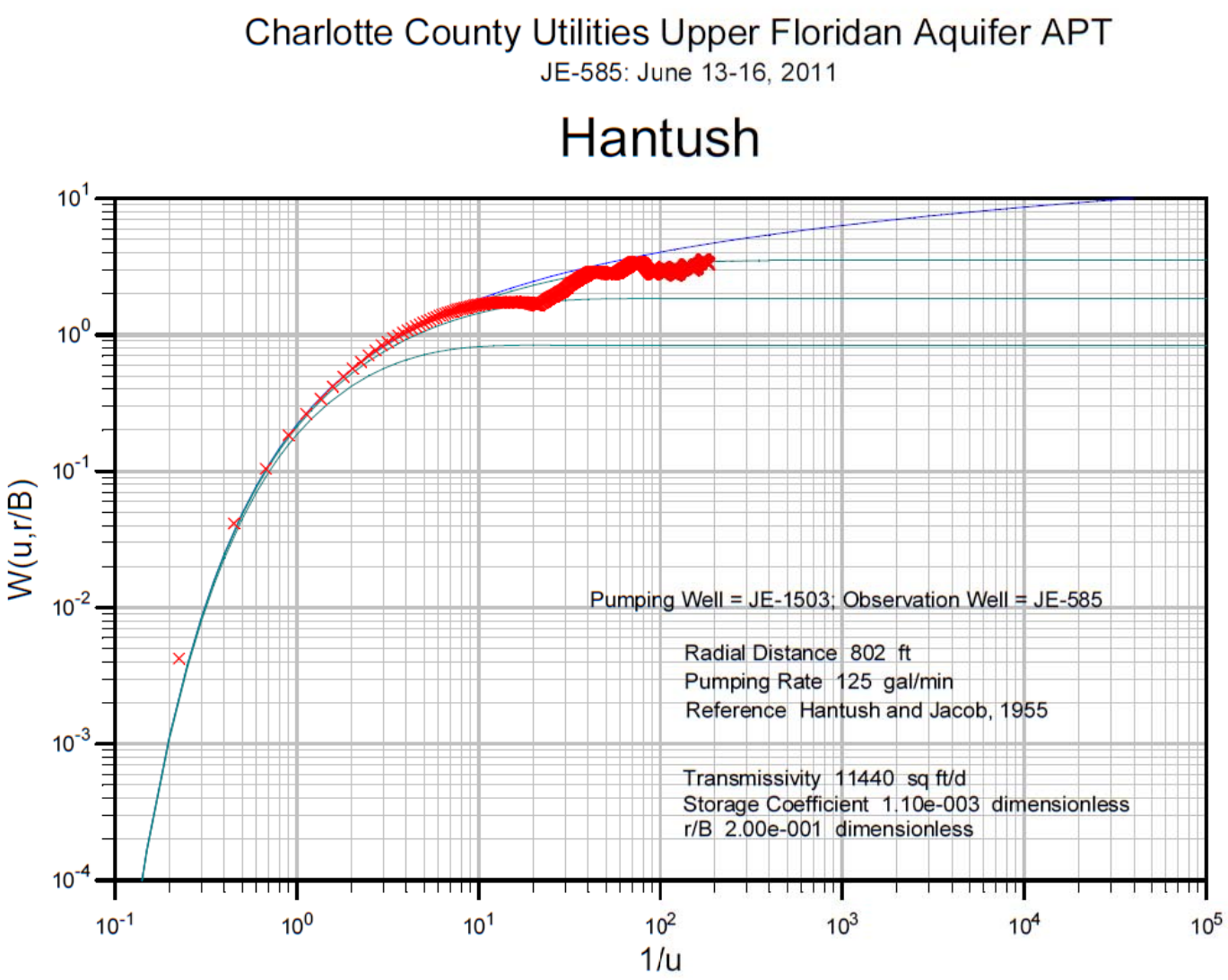
Form 0645-G60 (08/03)

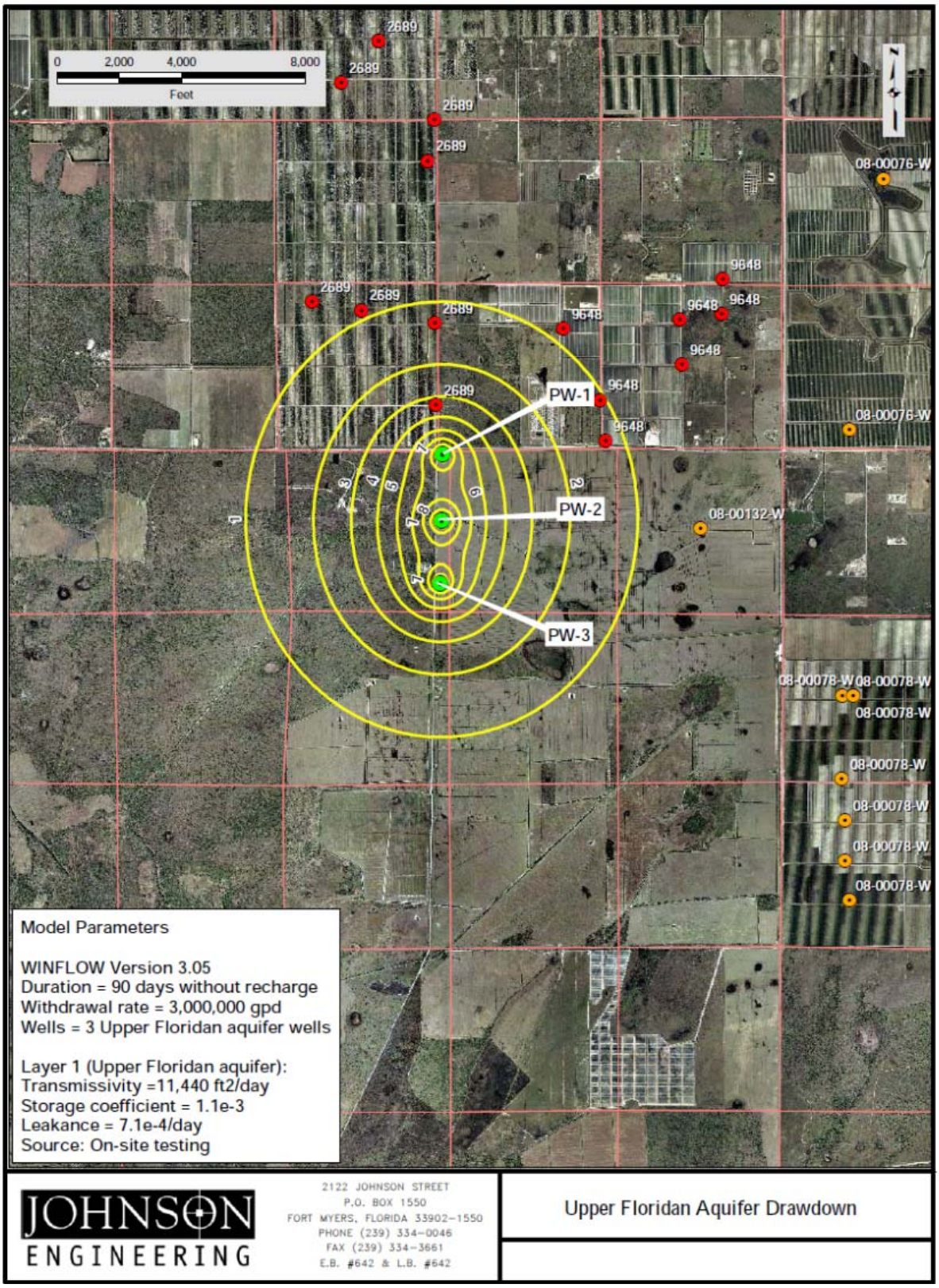

Upper Floridan Aquifer APT Water Levels
Water Elevation (feet NAVD88)
55.0
53.0
51.0
49.0
47.0
45.0
43.0
41.0
39.0
37.0
35.0
6/6/11
6/7/11
6/8/11
6/9/11
6/10/11
6/11/11
6/12/11
6/13/11
6/14/11
6/15/11
6/16/11
6/17/11
6/18/11
6/19/11
6/20/11
6/21/11
6/22/11
6/23/11
Date
JE-1503 #1: Upper Floridan
JE-1501 #1: Intermediate
JE-1502 #1: Water Table
JE-585 #1


ROMP 5 Water Level
Water Level (feet NGVD 1929)
54
53
52
51
50
49
48
47
46
45
Dec-99
Dec-00
Dec-01
Dec-02
Dec-03
Dec-04
Dec-05
Dec-06
Dec-07
Dec-08
Dec-09
Dec-10
Dec-11
Dec-12
Date
Arcadia (450-600' bls)
Suwannee (720-970' bls)

Charlotte County Utilities Upper Floridan Aquifer APT

JE-585: June 13-16, 2011





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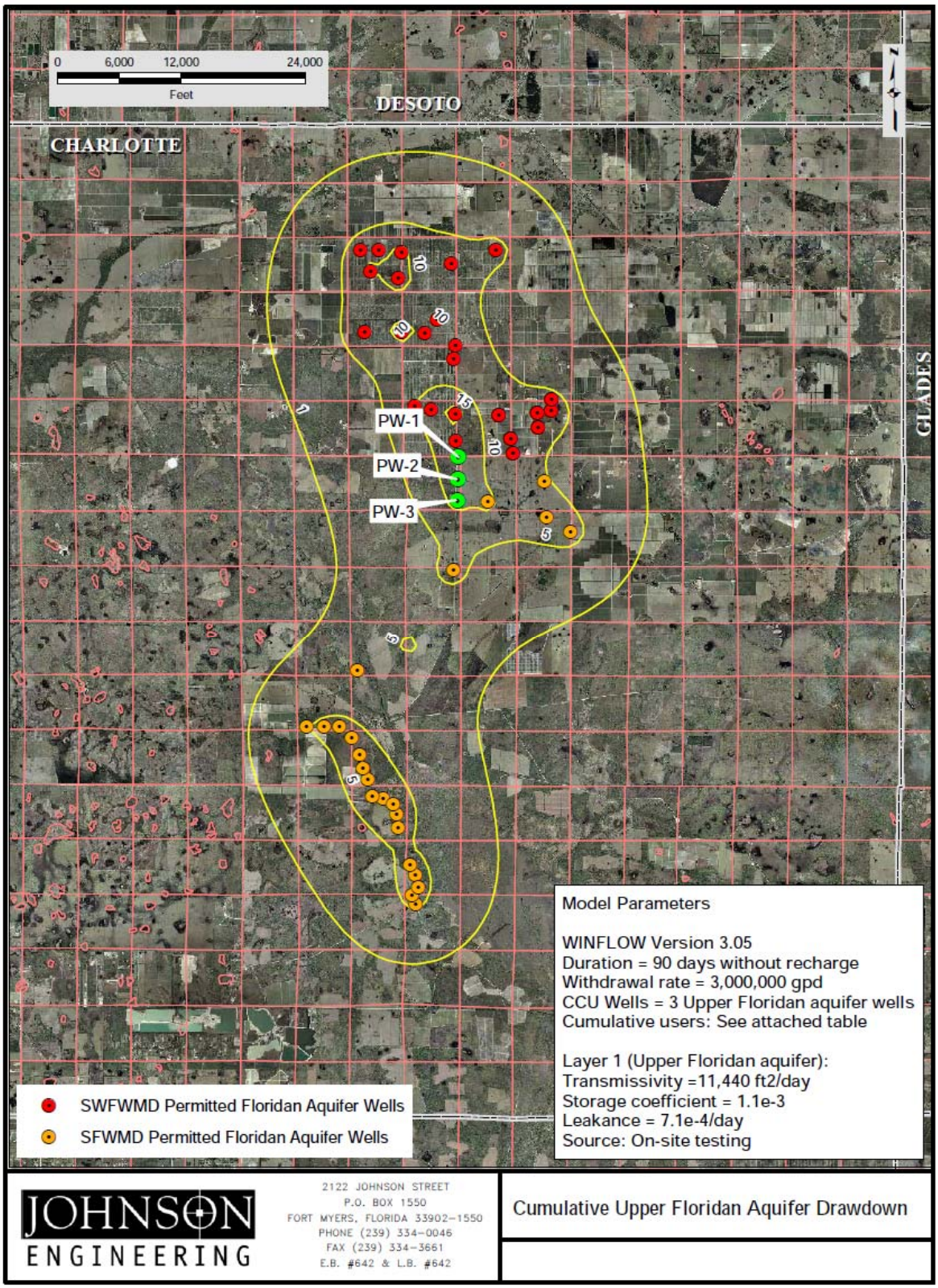

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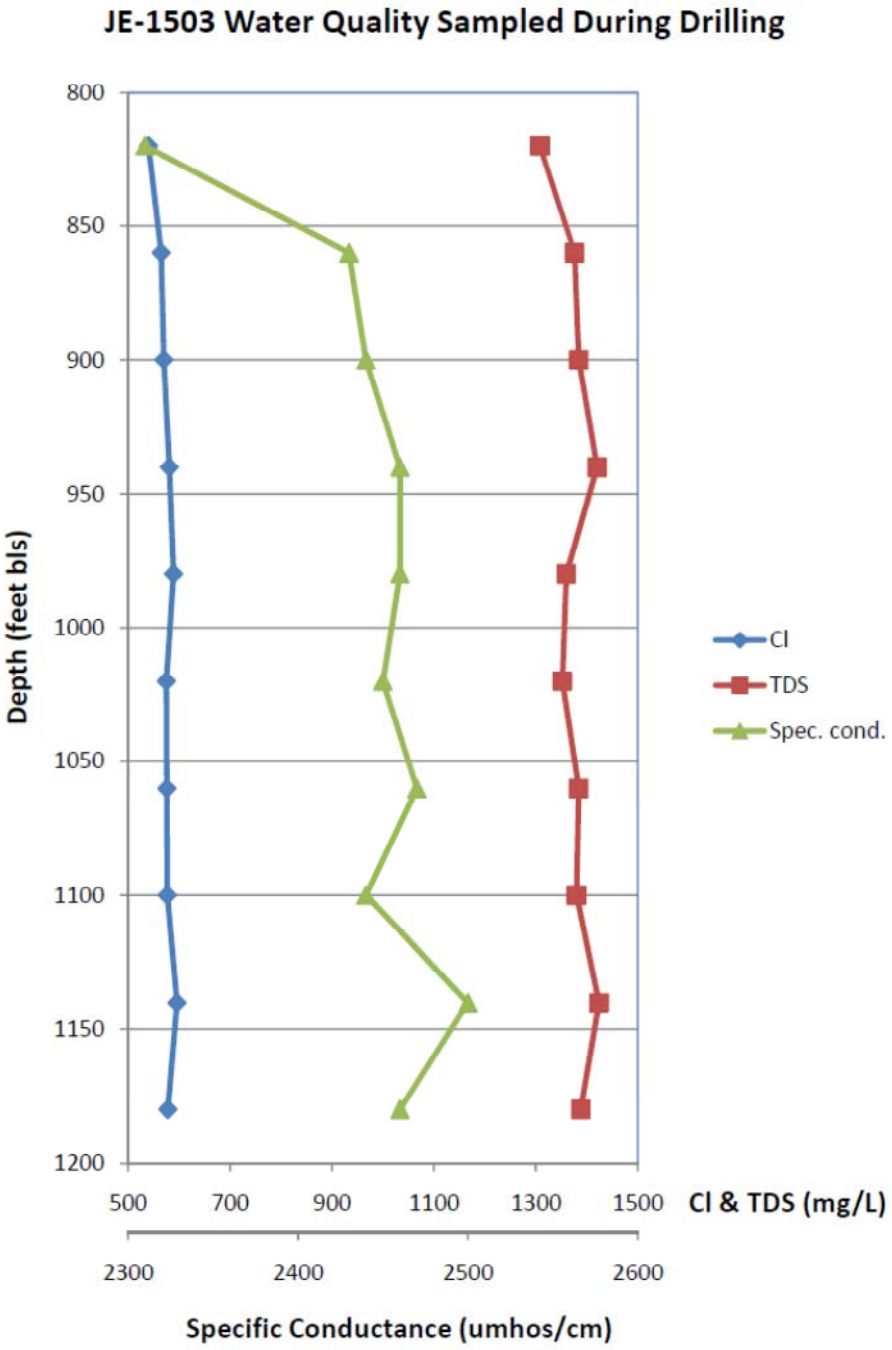
E.B. #642 & L.B. #642

Cumulative Upper Floridan Aquifer Drawdown

Exisitng Legal Users of Upper Floridan Aquifer Incuded in Cumulative Impact Model

Permit #	Project Name	Max Month Allocation (mgm)	Source
		SFWMD	
08-00122-W	Town and Country Utilities	205.1	Upper Floridan aquifer (17 wells)
08-00132-W	Babcock Ranch Preserve	152.28	Lower Hawthorn aquifer/FAS (6 wells)
		SWFWMD	
2689	East Charlotte Drainage District	397.92	Intermediate (per SWFWMD; 17 wells varying rates)
9648	Lady Moon Farms	51.67	Intermediate (per SWFWMD; 6 wells)


JE-1503 Water Quality Sampled During Drilling
800
850
900
950
1000
1050
1100
1150
1200
Depth (feet bls)
Cl
TDS
Spec. cond.
500
700
900
1100
1300
1500
Cl & TDS (mg/L)
2300
2400
2500
2600
Specific Conductance (umhos/cm)

Appendix I

Water Quality Samples Collected During Drilling from JE-1503

BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

ANALYTICAL TEST REPORT
THESE RESULTS MEET NELAC STANDARDS

Submission Number : 11050811

Johnson Engineering, Inc.
P.O. Box 1550
Fort Myers, Fl 33902

Project Name : BABCOCK RANCH SEPARATE WUP
Date Received : 05/27/2011
Time Received : 1208

Submission Number 11050811

Sample Number: 001 **Sample Description:** JE1503 820'
Sample Date: 05/25/2011 **Sample Method:** Grab
Sample Time: 0930

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	540	MG/L	0.353	1.412	300.0	06/01/2011	11:20	RK
SULFATE	191	MG/L	0.339	1.356	300.0	06/01/2011	11:20	RK
SPECIFIC CONDUCTANCE	2310	UMHOS/CM	1.24	4.96	SM2510B	06/01/2011	10:00	RR
TOTAL DISSOLVED SOLIDS	1308	MG/L	7.26	29.04	SM2540C	05/31/2011	16:30	DM

Submission Number 11050811

Sample Number: 002 **Sample Description:** JE1503 860'
Sample Date: 05/25/2011 **Sample Method:** Grab
Sample Time: 1200

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	565	MG/L	0.353	1.412	300.0	06/01/2011	11:20	RK
SULFATE	198	MG/L	0.339	1.356	300.0	06/01/2011	11:20	RK
SPECIFIC CONDUCTANCE	2430	UMHOS/CM	1.24	4.96	SM2510B	06/01/2011	10:00	RR
TOTAL DISSOLVED SOLIDS	1376	MG/L	7.26	29.04	SM2540C	05/31/2011	16:31	DM

BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

Submission Number 11050811

Sample Number: 003 **Sample Description:** JE1503 900'
Sample Date: 05/25/2011 **Sample Method:** Grab
Sample Time: 1420

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	570	MG/L	0.353	1.412	300.0	06/01/2011	11:20	RK
SULFATE	201	MG/L	0.339	1.356	300.0	06/01/2011	11:20	RK
SPECIFIC CONDUCTANCE	2440	UMHOS/CM	1.24	4.96	SM2510B	06/01/2011	10:00	RR
TOTAL DISSOLVED SOLIDS	1384	MG/L	7.26	29.04	SM2540C	05/31/2011	16:32	DM

Submission Number 11050811

Sample Number: 004 **Sample Description:** JE1503 940'
Sample Date: 05/25/2011 **Sample Method:** Grab
Sample Time: 1623

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	581	MG/L	0.353	1.412	300.0	06/01/2011	11:20	RK
SULFATE	202	MG/L	0.339	1.356	300.0	06/01/2011	11:20	RK
SPECIFIC CONDUCTANCE	2460	UMHOS/CM	1.24	4.96	SM2510B	06/01/2011	10:00	RR
TOTAL DISSOLVED SOLIDS	1420	MG/L	7.26	29.04	SM2540C	05/31/2011	16:33	DM

BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

Dale D. Dixon / Laboratory Director — 06/06/2011 Date

Tülay Tanrisever/ QC Officer

Jennifer Jordan / QC Officer

DATA QUALIFIERS THAT MAY APPLY:

A = Value reported is an average of two or more determinations.

B = Results based upon colony counts outside the ideal range.

H = Value based on field kit determination. Results may not be accurate.

I = Reported value is between the laboratory MDL and the PQL.

J = Estimated value.

J1 = Est. value surrogate recovery limits exceeded.

J2 = Est. value. No quality control criteria exists for component.

J3 = Est. value quality control criteria for precision or accuracy not met.

J4 = Est. value. Sample matrix interference suspected.

J5 = Est. value. Data questionable due to improper lab or field protocols

K = Off-scale low. Value is known to be < the value reported.

L = Off-scale high. Value is known to be > the value reported

N = Presumptive evidence of presence of material.

O = Sampled, but analysis lost or not performed.

Q = Sample held beyond accepted hold time.

T = Value reported is < MDL. Reported for informational purposes only and shall not be used in statistical analysis.

U = Analyte analyzed but not detected at the value indicated.

V = Analyte detected in sample and method blank.

Y = Analysis performed on an improperly preserved sample. Data may be inaccurate.

Z = Too many colonies were present (TNTC). The numeric value represents the filtration volume.

I = Data deviate from historically established concentration ranges.

? = Data rejected and should not be used. Some or all of QC data were outside criteria, and the Presence or absence of the analyte cannot be determined from the data.

* = Not reported due to interference.

NOTES:

PQL = 4xMDL.

MBAS calculated as LAS; molecular weight = 348.

X = Value exceed MCL.

NOTES:

For questions and comments regarding these results, please contact Bettina Beilfuss at (941) 723-9986

Results relate only to the samples.

1711 12th Street East * Palmetto, FL 34221 * Phone (941) 723-9986 * Fax (941) 723-6061

Benchmark EnviroAnalytical,Inc
1711 12th Street East
Palmetto, Fl 34221
941-723-9986
941-723-6061 Fax

Client Information: **Johnson Engineering**
PO Box 1550
Ft. Meyers, Fl 33920
239-461-2458 (Darren Howard)
239-332-1573
dhoward@johnsoneng.com

Project Name: Babcock Ranch Separate WUP
Project Number: 20118669-001

Laboratory Submission # 1105081 1

Sample Name	Sample Type[1] / Sample Matrix[2]	Collection		Container			Preservative[4]	Parameters for Analysis	Laboratory Sample #
		Date	Time	Qty	Capacity	Type[3]			
JE1503 820'	G/GW	5/25/11	930	1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	1
JE1503 860'	G/GW	5/25/11	1200	1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	2
JE1503 900'	G/GW	5/25/11	1420	1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	3
JE1503 940'	G/GW	5/25/11	1623	1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	4
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	

1 "Sample Type" is used to indicate whether the sample was a grab (G) or whether it was a composite (C).
2 "Sample Matrix" is used to indicate whether the sample is being discharged to drinking water (DW), groundwater (GW), surface water (SW), fresh surface water (FSW), saline surface water (SSW), soil, sediment (SDMNT), or sludge (SLDG).
3 "Container Type" is used to indicate whether the container is plastic (P) or glass (G).
4 **Sample must be refrigerated or stored in wet ice after collection. The temperature during storage should be less than or equal to 6°C (42.8°F).**
Under "Preservative," list any preservatives that were added to the sample container.

Laboratory Sample Acceptability:
pH <2 : Y
BEA Temperature: 1°C jkt

Instructions:
1. Each bottle has a label identifying sample ID, premeasured preservative contained in the bottle, sample type, client ID, and parameters for analysis.
2. The following information should be added to each bottle label after collection with permanent black ink: date and time of collection, sampler's name or initials, and any field number or ID.
3. All bottles not containing preservative may be rinsed with appropriate sample prior to collection.
4. The client is responsible for documentation of the sampling event. Please note special sampling events on the sample custody form.

1	Collected By: Darren Howard	Date 5/25/11	Time 1700 1200	Received By:	Date	Time
2	Relinquished By: Darren Howard	Date 5/26	Time 1200	Received By:	Date 5/26/11	Time 9:35
3	Relinquished By:	Date 5.27.11	Time 1208	Received By: J. Hallada	Date 5-27-11	Time 1208
4	Relinquished By:	Date	Time	Received By:	Date	Time

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BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

ANALYTICAL TEST REPORT
THESE RESULTS MEET NELAC STANDARDS

Submission Number : 11060081

Johnson Engineering, Inc.
P.O. Box 1550
Fort Myers, Fl 33902

Project Name : BABCOCK RANCH SEPARATE WUP
Date Received : 06/02/2011
Time Received : 1445

Submission Number 11060081

Sample Number: 001 **Sample Description:** JE1503 980'
Sample Date: 05/27/2011 **Sample Method:** Grab
Sample Time: 0939

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	589	MG/L	0.353	1.412	300.0	06/06/2011	14:30	RK
SULFATE	239	MG/L	0.339	1.356	300.0	06/06/2011	14:30	RK
SPECIFIC CONDUCTANCE	2460	UMHOS/CM	1.24	4.96	SM2510B	06/03/2011	12:50	RR
TOTAL DISSOLVED SOLIDS	1360	MG/L	7.26	29.04	SM2540C	06/03/2011	09:00	DM

Submission Number 11060081

Sample Number: 002 **Sample Description:** JE1503 1020'
Sample Date: 05/27/2011 **Sample Method:** Grab
Sample Time: 1135

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	575	MG/L	0.353	1.412	300.0	06/06/2011	14:30	RK
SULFATE	234	MG/L	0.339	1.356	300.0	06/06/2011	14:30	RK
SPECIFIC CONDUCTANCE	2450	UMHOS/CM	1.24	4.96	SM2510B	06/03/2011	12:50	RR
TOTAL DISSOLVED SOLIDS	1352	MG/L	7.26	29.04	SM2540C	06/03/2011	09:00	DM

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EnviroAnalytical Inc.

NELAC Certification # E84167

Submission Number 11060081

Sample Number: 003 **Sample Description:** JE1503 1060'
Sample Date: 05/27/2011 **Sample Method:** Grab
Sample Time: 1340

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	576	MG/L	0.353	1.412	300.0	06/06/2011	14:30	RK
SULFATE	234	MG/L	0.339	1.356	300.0	06/06/2011	14:30	RK
SPECIFIC CONDUCTANCE	2470	UMHOS/CM	1.24	4.96	SM2510B	06/03/2011	12:50	RR
TOTAL DISSOLVED SOLIDS	1384	MG/L	7.26	29.04	SM2540C	06/03/2011	09:00	DM

Submission Number 11060081

Sample Number: 004 **Sample Description:** JE1503 1100'
Sample Date: 05/27/2011 **Sample Method:** Grab
Sample Time: 1530

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	577	MG/L	0.353	1.412	300.0	06/06/2011	14:30	RK
SULFATE	233	MG/L	0.339	1.356	300.0	06/06/2011	14:30	RK
SPECIFIC CONDUCTANCE	2440	UMHOS/CM	1.24	4.96	SM2510B	06/03/2011	12:50	RR
TOTAL DISSOLVED SOLIDS	1380	MG/L	7.26	29.04	SM2540C	06/03/2011	09:00	DM

Submission Number 11060081

Sample Number: 005 **Sample Description:** JE1503 1140'
Sample Date: 05/31/2011 **Sample Method:** Grab
Sample Time: 1135

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	596	MG/L	0.353	1.412	300.0	06/06/2011	14:30	RK
SULFATE	235	MG/L	0.339	1.356	300.0	06/06/2011	14:30	RK
SPECIFIC CONDUCTANCE	2500	UMHOS/CM	1.24	4.96	SM2510B	06/03/2011	12:50	RR
TOTAL DISSOLVED SOLIDS	1424	MG/L	7.26	29.04	SM2540C	06/03/2011	09:00	DM

BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

Submission Number 11060081

Sample Number: 006 **Sample Description:** JE1503 1180'
Sample Date: 05/31/2011 **Sample Method:** Grab
Sample Time: 1400

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	587	MG/L	0.353	1.412	300.0	06/06/2011	14:30	RK
SULFATE	236	MG/L	0.339	1.356	300.0	06/06/2011	14:30	RK
SPECIFIC CONDUCTANCE	2480	UMHOS/CM	1.24	4.96	SM2510B	06/03/2011	12:50	RR
TOTAL DISSOLVED SOLIDS	1424	MG/L	7.26	29.04	SM2540C	06/03/2011	09:00	DM

Submission Number 11060081

Sample Number: 007 **Sample Description:** JE1503 1200'
Sample Date: 05/31/2011 **Sample Method:** Grab
Sample Time: 1500

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	578	MG/L	0.353	1.412	300.0	06/06/2011	14:30	RK
SULFATE	232	MG/L	0.339	1.356	300.0	06/06/2011	14:30	RK
SPECIFIC CONDUCTANCE	2460	UMHOS/CM	1.24	4.96	SM2510B	06/03/2011	12:50	RR
TOTAL DISSOLVED SOLIDS	1388	MG/L	7.26	29.04	SM2540C	06/03/2011	09:00	DM

BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

06/10/2011

Dale D. Dixon / Laboratory Director — Date

Tülay Tanrisever/ QC Officer

Jennifer Jordan / QC Officer

DATA QUALIFIERS THAT MAY APPLY:

A = Value reported is an average of two or more determinations.

B = Results based upon colony counts outside the ideal range.

H = Value based on field kit determination. Results may not be accurate.

I = Reported value is between the laboratory MDL and the PQL.

J = Estimated value.

J1 = Est. value surrogate recovery limits exceeded.

J2 = Est. value. No quality control criteria exists for component.

J3 = Est. value quality control criteria for precision or accuracy not met.

J4 = Est. value. Sample matrix interference suspected.

J5 = Est. value. Data questionable due to improper lab or field protocols

K = Off-scale low. Value is known to be < the value reported.

L = Off-scale high. Value is known to be > the value reported

N = Presumptive evidence of presence of material.

O = Sampled, but analysis lost or not performed.

Q = Sample held beyond accepted hold time.

T = Value reported is < MDL. Reported for informational purposes only and shall not be used in statistical analysis.

U = Analyte analyzed but not detected at the value indicated.

V = Analyte detected in sample and method blank.

Y = Analysis performed on an improperly preserved sample. Data may be inaccurate.

Z = Too many colonies were present (TNTC). The numeric value represents the filtration volume.

! = Data deviate from historically established concentration ranges.

? = Data rejected and should not be used. Some or all of QC data were outside criteria, and the Presence or absence of the analyte cannot be determined from the data.

* = Not reported due to interference.

NOTES:

PQL = 4xMDL.

MBAS calculated as LAS; molecular weight = 348.

X = Value exceed MCL.

NOTES:

For questions and comments regarding these results, please contact Bettina Beilfuss at (941) 723-9986

Results relate only to the samples.

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Client Information: **Johnson Engineering**
PO Box 1550
Ft. Meyers, Fl 33920
239-461-2458 (Darren Howard)
239-332-1573
dhoward@johnsoneng.com

Project Name: Babcock Ranch Separate WUP
Project Number: 20118669-001

Laboratory Submission # 11060081

Sample Name	Sample Type[1] / Sample Matrix[2]	Collection Date	Collection Time	Container Qty	Container Capacity	Container Type[3]	Preservative[4]	Parameters for Analysis	Laboratory Sample #
JE1503 980'	G/GW	5/27/11	939	1	~~½ Pint~~ 500mL	P tall	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	1
JE1503 1020'	G/GW	5/27/11	1135	1	~~½ Pint~~ 500mL	P Tall	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	2
JE1503 1060'	G/GW	5/27/11	1340	1	½ Pint 500mL	P Tall	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	3
JE1503 1100'	G/GW	5/27/11	1530	1	~~½ Pint~~ 1Qt Squat	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	4
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	

1 "Sample Type" is used to indicate whether the sample was a grab (G) or whether it was a composite (C).
2 "Sample Matrix" is used to indicate whether the sample is being discharged to drinking water (DW), groundwater (GW), surface water (SW), fresh surface water (FSW), saline surface water (SSW), soil, sediment (SDMNT), or sludge (SLDG).
3 "Container Type" is used to indicate whether the container is plastic (P) or glass (G).
4 **Sample must be refrigerated or stored in wet ice after collection. The temperature during storage should be less than or equal to 6°C (42.8°F).**
Under "Preservative," list any preservatives that were added to the sample container.

Laboratory Sample Acceptability:
pH <2 : Y
BEA Temperature: 1°C

Instructions:
1. Each bottle has a label identifying sample ID, premeasured preservative contained in the bottle, sample type, client ID, and parameters for analysis.
2. The following information should be added to each bottle label after collection with permanent black ink: date and time of collection, sampler's name or initials, and any field number or ID.
3. All bottles not containing preservative may be rinsed with appropriate sample prior to collection.
4. The client is responsible for documentation of the sampling event. Please note special sampling events on the sample custody form.

1	Collected By: Darren Howard	Date 6/2/11	Time 820	Received By:	Date 6/2/11	Time 1620
2	Relinquished By:	Date 6/2/11	Time 1127	Received By: Melinda Meehrant	Date 6/2/11	Time 1127
3	Relinquished By: Melinda Meehrant	Date 6/2/11	Time 1215	Received By: Wayne Ver Cammen	Date 6-2-11	Time 1215
4	Relinquished By: Wayne Ver Cammen	Date 6-2-11	Time 1445	Received By:	Date 6/2/11	Time 1445

5 of 6

Benchmark EnviroAnalytical,Inc
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Client Information: **Johnson Engineering**
PO Box 1550
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239-461-2458 (Darren Howard)
239-332-1573
dhoward@johnsoneng.com

Project Name: Babcock Ranch Separate WUP
Project Number: 20118669-001

Laboratory Submission # 11060081

Sample Name	Sample Type[1] / Sample Matrix[2]	Collection Date	Collection Time	Container Qty	Container Capacity	Container Type[3]	Preservative[4]	Parameters for Analysis	Laboratory Sample #
JE1503 1140'	G/GW	5/31/11	1135	1	½ Pint 1Qt Squat	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	5
JE1503 1180'	G/GW	5/31/11	1400	1	½ Pint 1Qt Squat	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	6
JE1503 1200'	G/GW	5/31/11	1500	1	½ Pint 1000ml Tall	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	7
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540D) Specific Conductance (SM2510B)	

1 "Sample Type" is used to indicate whether the sample was a grab (G) or whether it was a composite (C).
2 "Sample Matrix" is used to indicate whether the sample is being discharged to drinking water (DW), groundwater (GW), surface water (SW), fresh surface water (FSW), saline surface water (SSW), soil, sediment (SDMNT), or sludge (SLDG).
3 "Container Type" is used to indicate whether the container is plastic (P) or glass (G).
4 **Sample must be refrigerated or stored in wet ice after collection. The temperature during storage should be less than or equal to 6°C (42.8°F).** Under "Preservative," list any preservatives that were added to the sample container.

Laboratory Sample Acceptability:
pH <2 : Y
BEA Temperature: 1C

Instructions:
1. Each bottle has a label identifying sample ID, premeasured preservative contained in the bottle, sample type, client ID, and parameters for analysis.
2. The following information should be added to each bottle label after collection with permanent black ink: date and time of collection, sampler's name or initials, and any field number or ID.
3. All bottles not containing preservative may be rinsed with appropriate sample prior to collection.
4. The client is responsible for documentation of the sampling event. Please note special sampling events on the sample custody form.

1	Collected By: Darren Howard	Date 6/2/11	Time 820	Received By:	Date 6/2/11	Time 1017
2	Relinquished By:	Date 6/2/11	Time 1127	Received By: Melinda Merchant	Date 6/2/11	Time 1127
3	Relinquished By: Melinda Merchant	Date 6/2/11	Time 1215	Received By: Wayne Van Gammen	Date 6-2-11	Time 1215
4	Relinquished By: Wayne Van Gammen	Date 6-2-11	Time 1445	Received By:	Date 6/2/11	Time 1445

Water Quality Samples Collected at Discrete Depths from JE-1503 Using Bailer

BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

ANALYTICAL TEST REPORT
THESE RESULTS MEET NELAC STANDARDS

Submission Number : 11060232

Johnson Engineering, Inc.
P.O. Box 1550
Fort Myers, Fl 33902

Project Name : BABCOCK RANCH SEPARATE WUP
Date Received : 06/08/2011
Time Received : 1430

Submission Number 11060232

Sample Number: 001
Sample Date: 06/06/2011
Sample Time: 1130
Sample Description: JE1503 520'
Sample Method: Grab

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	574	MG/L	0.353	1.412	300.0	06/10/2011	17:00	RK/CB
SULFATE	204	MG/L	0.339	1.356	300.0	06/10/2011	17:00	RK/CB
SPECIFIC CONDUCTANCE	2510	UMHOS/CM	1.24	4.96	SM2510B	06/09/2011	10:56	RR
TOTAL DISSOLVED SOLIDS	1380	MG/L	7.26	29.04	SM2540C	06/10/2011	11:32	DM

Submission Number 11060232

Sample Number: 002
Sample Date: 06/06/2011
Sample Time: 1200
Sample Description: JE1503 620'
Sample Method: Grab

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	606	MG/L	0.353	1.412	300.0	06/10/2011	17:00	RK/CB
SULFATE	218	MG/L	0.339	1.356	300.0	06/10/2011	17:00	RK/CB
SPECIFIC CONDUCTANCE	2650	UMHOS/CM	1.24	4.96	SM2510B	06/09/2011	10:56	RR
TOTAL DISSOLVED SOLIDS	1460	MG/L	7.26	29.04	SM2540C	06/10/2011	11:34	DM

Submission Number 11060232

Sample Number: 003 **Sample Description:** JE1503 800'
Sample Date: 06/06/2011 **Sample Method:** Grab
Sample Time: 1230

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	630	MG/L	0.353	1.412	300.0	06/10/2011	17:00	RK/CB
SULFATE	227	MG/L	0.339	1.356	300.0	06/10/2011	17:00	RK/CB
SPECIFIC CONDUCTANCE	2740	UMHOS/CM	1.24	4.96	SM2510B	06/09/2011	10:56	RR
TOTAL DISSOLVED SOLIDS	1520	MG/L	7.26	29.04	SM2540C	06/10/2011	11:36	DM

Submission Number 11060232

Sample Number: 004 **Sample Description:** JE1503 1000'
Sample Date: 06/06/2011 **Sample Method:** Grab
Sample Time: 1300

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	518	MG/L	0.353	1.412	300.0	06/10/2011	17:00	RK/CB
SULFATE	203	MG/L	0.339	1.356	300.0	06/10/2011	17:00	RK/CB
SPECIFIC CONDUCTANCE	2380	UMHOS/CM	1.24	4.96	SM2510B	06/09/2011	10:56	RR
TOTAL DISSOLVED SOLIDS	1332	MG/L	7.26	29.04	SM2540C	06/10/2011	11:37	DM

Submission Number 11060232

Sample Number: 005 **Sample Description:** JE1503 1200'
Sample Date: 06/06/2011 **Sample Method:** Grab
Sample Time: 1330

Parameter	Result	Units	MDL	PQL	Procedure	Analysis Date	Analysis Time	Analyst
CHLORIDE	449	MG/L	0.353	1.412	300.0	06/10/2011	17:00	RK/CB
SULFATE	201	MG/L	0.339	1.356	300.0	06/10/2011	17:00	RK/CB
SPECIFIC CONDUCTANCE	2170	UMHOS/CM	1.24	4.96	SM2510B	06/09/2011	10:56	RR
TOTAL DISSOLVED SOLIDS	1264	MG/L	7.26	29.04	SM2540C	06/10/2011	11:38	DM

BENCHMARK
EnviroAnalytical Inc.

NELAC Certification # E84167

06/15/2011

Dale D. Dixon / Laboratory Director — Date

Tülay Tanrisever/ QC Officer

Jennifer Jordan / QC Officer

DATA QUALIFIERS THAT MAY APPLY:

A = Value reported is an average of two or more determinations.

B = Results based upon colony counts outside the ideal range.

H = Value based on field kit determination. Results may not be accurate.

I = Reported value is between the laboratory MDL and the PQL.

J = Estimated value.

J1 = Est. value surrogate recovery limits exceeded.

J2 = Est. value. No quality control criteria exists for component.

J3 = Est. value quality control criteria for precision or accuracy not met.

J4 = Est. value. Sample matrix interference suspected.

J5 = Est. value. Data questionable due to improper lab or field protocols

K = Off-scale low. Value is known to be < the value reported.

L = Off-scale high. Value is known to be > the value reported

N = Presumptive evidence of presence of material.

O = Sampled, but analysis lost or not performed.

Q = Sample held beyond accepted hold time.

T = Value reported is < MDL. Reported for informational purposes only and shall not be used in statistical analysis.

U = Analyte analyzed but not detected at the value indicated.

V = Analyte detected in sample and method blank.

Y = Analysis performed on an improperly preserved sample. Data may be inaccurate.

Z = Too many colonies were present (TNTC). The numeric value represents the filtration volume.

! = Data deviate from historically established concentration ranges.

? = Data rejected and should not be used. Some or all of QC data were outside criteria, and the Presence or absence of the analyte cannot be determined from the data.

" = Not reported due to interference.

NOTES:

PQL = 4xMDL.

MBAS calculated as LAS; molecular weight = 348.

X = Value exceed MCL.

NOTES:

For questions and comments regarding these results, please contact Bettina Bellfuss at (941) 723-9986

Results relate only to the samples.

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Client Information: **Johnson Engineering**
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dhoward@johnsoneng.com

Page 1 of 1

Project Name: Babcock Ranch Separate WUP
Project Number: 20118669-001

Laboratory Submission # 11060232

Sample Name	Sample Type[1] / Sample Matrix[2]	Collection Date	Collection Time	Container Qty	Container Capacity	Container Type[3]	Preservative[4]	Parameters for Analysis	Laboratory Sample #
JE1503 520'	G/GW	6/6/11	1130	1	½ Pint 500 mL	P	Plain	Cl SO_4 (300.0) TDS (SM2540C) Specific Conductance (SM2510B)	1
JE1503 620'	G/GW	6/6/11	1200	1	½ Pint 500mL	P	Plain	Cl SO_4 (300.0) TDS (SM2540C) Specific Conductance (SM2510B)	2
JE1503 800'	G/GW	6/6/11	1230	1	½ Pint 500mL	P	Plain	Cl SO_4 (300.0) TDS (SM2540C) Specific Conductance (SM2510B)	3
JE1503 1000'	G/GW	6/6/11	1300	1	½ Pint 500mL	P	Plain	Cl SO_4 (300.0) TDS (SM2540C) Specific Conductance (SM2510B)	4
JE1503 1200'	G/GW	6/6/11	1330	1	½ Pint 500 mL	P	Plain	Cl SO_4 (300.0) TDS (SM2540C) Specific Conductance (SM2510B)	5
				1	½ Pint	P	Plain	Cl SO_4 (300.0) TDS (SM2540C) Specific Conductance (SM2510B)	

1 "Sample Type" is used to indicate whether the sample was a grab (G) or whether it was a composite (C).
2 "Sample Matrix" is used to indicate whether the sample is being discharged to drinking water (DW), groundwater (GW), surface water (SW), fresh surface water (FSW), saline surface water (SSW), soil, sediment (SDMNT), or sludge (SLDG).
3 "Container Type" is used to indicate whether the container is plastic (P) or glass (G).
4 **Sample must be refrigerated or stored in wet ice after collection. The temperature during storage should be less than or equal to 6°C (42.8°F).** Under "Preservative," list any preservatives that were added to the sample container.

* Method corrected on COC. JLC 6/15/11

Laboratory Sample Acceptability:
pH <2 : Y
BEA Temperature: 0.c

Instructions:
1. Each bottle has a label identifying sample ID, premeasured preservative contained in the bottle, sample type, client ID, and parameters for analysis.
2. The following information should be added to each bottle label after collection with permanent black ink: date and time of collection, sampler's name or initials, and any field number or ID.
3. All bottles not containing preservative may be rinsed with appropriate sample prior to collection.
4. The client is responsible for documentation of the sampling event. Please note special sampling events on the sample custody form.

1	Collected By: Darren Howard	Date 6/7/11	Time 1100	Received By:	Date 6/8/11	Time 1010
2	Relinquished By:	Date 6-8-11	Time 1130	Received By: Wayne VanDamme	Date 6-8-11	Time 1130
3	Relinquished By: Wayne VanDamme	Date 6-8-11	Time 1430	Received By:	Date 6/8/11	Time 1430
4	Relinquished By:	Date	Time	Received By:	Date	Time