2024 MECHANICAL INTEGRITY TESTING AND PRESSURE FALLOFF TESTING REPORT

REPUBLIC INDUSTRIAL & ENERGY SOLUTIONS, LLC

WELL NO. 1-12

API No. 21-163-M452
EPA Permit No. MI-163-1W-C0010
Michigan EGLE Permit No. M-452
Romulus, MI

September 2024

Houston, TX

Project No. 192128.0156

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1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (U.S. EPA), requirements included in the Class I UIC permit number MI-163-1W-C010 granted to Republic Industrial and Energy Solutions, LLC (Republic) and with the State of Michigan Administrative Rule R299.2393 (MI Permit #M-452) the annual mechanical integrity testing was performed on Well No. 1-12 on August 6, 2024 to demonstrate the mechanical integrity of the casing, packer, and tubing.

Republic Industrial and Energy Solutions, LLC (Republic) retained WSP USA (WSP) to perform the annual mechanical integrity testing on Well No. 1-12 at Republic's facility in Romulus, MI. The mechanical integrity tests included a Radioactive Tracer Survey and an Annulus Pressure Test. All tests were conducted in accordance with United States Environmental Protection Agency (USEPA) 40 CFR 146.8 and 146.13(b)(3), (c)(2)(i), and (d). Approved testing procedures are included as Appendix A.

In addition to the mechanical integrity testing, a bottom hole pressure falloff test (Ambient Pressure Monitoring) was run in Well No. 1-12 to assist in evaluating the injection zone. A chronology of field activities is included as Appendix B. Wellhead and wellbore schematics of Well No. 1-12 are included as Figures 1 and 2, respectively.

2.0 REPORT OF FIELD OPERATIONS

All depths in this report, unless otherwise noted, are referenced to the Kelly Bushing (KB) elevation which is 13 feet above the ground level elevation for Well No. 1-12. A wellbore schematic of Well 1-12 is presented as Figure 2. A chronological report of field activities is presented as Appendix B.

Republic performed the annulus pressure test (APT) on August 6, 2024, to demonstrate that there is no significant leak in the tubing, casing or packer. JoAnne Mitock with Environmental Solutions AQ (support for USEPA Region 5) witnessed and passed the test. The annulus pressure test results are detailed in Section 3.0.

Field wireline operations began on August 6, 2024, when Michigan Wireline spotted and rigged up on the well with Casing Collar Locator (CCL) and Radioactive Tracer tools. A radioactive tracer survey (RTS) was run on August 6, 2024. A pre-survey base log and 5-minute statistical checks were ran with no injection. Injection was initiated at 44 gallons (gpm), then a slug of radioactive material was released at 3100 feet. A dissipated slug was located at approximately 4245 feet with Chase Pass No. 4. A slug of radioactive material was ejected at 3750 feet, and the lower gamma ray detector was run downhole and positioned at 4050 feet to observe the slug passing by and monitor for any upward migration. The time-drive survey was conducted for approximately 30 minutes at 44 gpm and 375 psi injection pressure. To conclude the RTS, the well was shut-in and the post-survey log was run. The radioactive tracer survey results are detailed in Section 4.0.

On August 8, 2024, Impact Completions spotted and rigged up slickline with memory-type bottom-hole pressure gauges. The memory gauges were run downhole and set at 4080 feet (top gauge at 4078 feet). Injection was initiated at 0908 hours. Republic began to discontinue injection of plant effluent into Well 1-12 at 2015 hours on August 8, 2024. The pressure falloff was monitored for approximately 19.9 hours and was concluded on August 9, 2024. While pulling the gauges out of the well, static pressure gradient stops were made at 4000 feet, 3000 feet, 2000 feet, 1000 feet, and at the surface. Well 2-12 was shut-in throughout the build-up and falloff period. The falloff test and bottom hole static pressure gradient results are detailed in Sections 5.0 and 6.0, respectively.

3.0 ANNULUS PRESSURE TEST

An Annulus Pressure Test (APT) was conducted on Well #1-12 on Monday, August 6, 2024, with JoAnne Mitock with Environmental Solutions AQ (support for USEPA Region 5) witnessed and passed the test. Between 08:06 AM and 08:09 AM, the annulus pressure was increased from 607 psig to 1108 psig. The official APT was started at 08:15 AM at a pressure of 1098 psig. One hour later at 09:15 AM, the annulus pressure had declined to 1086 psig which was a decrease of 12 psi (-1.1%) and within the ±3%/hour allowed by the EPA Region 5.

A plot of the APT is provided as Figure 3, and a tabulate of the APT data is provided as Appendix C. A calibration certificate for the digital pressure gauge is included in Appendix D. Signed copy of the Standard Annular Pressure Test Form is provided as Appendix E.

4.0 RADIOACTIVE TRACER SURVEY

A Radioactive Tracer Survey was run in Well #1-12 on August 6, 2024. The survey was conducted using the facility's pump and fresh water. After correlating the log with the top of the packer set at 4032 feet, the tool tagged bottom at 4460 feet.

A Base Pass was made from 4486 feet to 3000 feet, and 5-minute statistical checks were made at 3802 feet and 3955 feet. While injecting into the well at 44 gal/min, a 4-second slug of radioactive material (Iodine-131) was released at 3100 feet. Four Chase Passes were made through the radioactive slug as it traveled down the tubing and dissipated into the Injection Interval, below the 7-inch protection casing set at 4075 feet, dissipating at approximately 4245 feet. A summary of the Chase Passes with flow rate is provided as Table 1. No radioactive material was detected exiting the well above the Injection Interval, demonstrating the external mechanical integrity of the well.

The injection rate was kept at 44 gal/min, and a 4-second slug of radioactive material was released at 3750 feet. The upper and lower gamma ray detectors were then positioned at 4,041 feet and 4,050 feet, respectively. At 16:36:00 the slug passed by the upper gamma ray detector, and 17 seconds later at 16:36:17, the slug passed by the lower gamma ray detector. Approximately 40 seconds after the radioactive slug passed by each gamma ray detector, the level of radiation returned to background levels on both gamma ray detectors and remained at background levels for the duration of the time-drive survey. The time-drive survey was terminated at 17:08:11 which was 32 minutes after the radioactive slug passed by the lower gamma ray detector. No vertical migration was detected during the time-drive survey, demonstrating the base of the 7-inch protection casing cement had mechanical integrity.

Injection was ceased. A final gamma ray pass was made from 4460 feet to 3000 feet following the time-drive survey. Above approximately 4135 feet, the final pass repeated the base pass with the upper and lower gamma ray detectors. Below 4250 feet, both gamma ray detectors averaged approximately 10 counts/sec higher on the final pass, indicating residual tracer material in the borehole. Some of this small increase may have been due to residual radioactive material in the borehole getting dispersed with movement of the tool.

A copy of the Radioactive Tracer Survey is included as Exhibit 1. Appendix F provides a completed EPA Radioactive Tracer Survey Form with background information of the Well #1-12 survey. A letter of interpretation is presented as Appendix G.

5.0 PRESSURE FALLOFF ANALYSIS

Pressure falloff testing was conducted on Well 1-12 from August 8, 2024, through August 9, 2024. A Badger Low Temp, Serial No. 91933 pressure gauge was utilized during the testing. The gauge calibration certificates are presented in Appendix D and show the gauges have been calibrated as specified by the gauge manufacturer.

Injection Period

The rate data used in the analysis of the falloff pressure data was the injection period on August 8, 2024, through shut-in. Well 1-12 had been shut in for approximately 39.9 hours prior to commencement of the buildup portion of the test. Injection began August 8, 2024 at 0908 hours, then continued for approximately 11.1 hours. General well and reservoir information is presented in Table 2. Information pertinent to the injection period is presented in Table 3.

Falloff Period

Well 1-12 was shut in at 2015 hours on August 8, 2024 and remained shut-in for approximately 19.9 hours while the bottom-hole pressure and temperature were recorded. Appendix H lists the pressure and temperature data recorded during the test. Table 4 contains information pertinent to the falloff period of the test.

Analysis of Falloff Test

The pressure data obtained during the falloff test were analyzed utilizing the commercially available pressure transient analysis software program PanSystem©. The PanSystem© output for the analysis of this test is presented in Appendix I. Impact Completion's pressure test report is presented as Appendix J. A completed EPA Pressure Falloff Test Form is provided in Appendix K.

Figure 4 shows the pressure response recorded by the bottom-hole pressure tool from the time the tool was in place through the 19.9-hour shut-in period. Figure 5 is a Cartesian plot of the pressure data recorded during the falloff period. The superposition time function was used to account for all rate changes during the injection buildup period of the testing.

Figure 6 is a log-log diagnostic plot of the falloff data, showing change in pressure and pressure derivative versus elapsed shut-in time. Radial flow begins to appear at an elapsed time following shut-in of 0.827 hours and continues until an elapsed time following shut-in of 2.172 hours. The radial flow regime is indicated on Figure 7.

The reservoir permeability was determined from the radial flow region of the superposition Horner plot (Figure 7). The radial flow regime begins at a superposition Horner time of 14.09 and continues until 5.99. Figure 8 shows an expanded view of the superposition Horner plot. The slope of the radial flow period was determined to be 12.755 psi/cycle.

An estimate of mobility-thickness, kh/μ, for the reservoir was determined from the following equation:

$$\frac{kh}{\mu} = 162.6 * \frac{qB}{m}$$

Where,

kh/μ	=	formation mobility-thickness, millidarcy-feet/centipoise
q	=	rate prior to shut-in, bpd
B	=	formation volume factor, reservoir volume/surface volume
m	=	slope radial flow period, psi/cycle

With the following values, the mobility-thickness was found to be 19,248.6 md-ft/cp:

q	=	1509.94 barrels/day (44.04 gallons/minute)
m	=	12.755 psi/cycle
B	=	1.0 reservoir barrel/surface barrel

$$\frac{kh}{\mu} = 162.6\ \frac{(1509.94)(1.0)}{12.755}$$

$$= 19{,}248.6 \text{ md-ft/cp}$$

The permeability-thickness, kh, was determined to be 15,398.9 md-ft by multiplying the mobility-thickness, kh/μ, by the viscosity of the formation fluid viscosity, $\mu_{formation}$, of 0.80 centipoise:

$$kh = \left(\frac{kh}{\mu}\right)\mu_{waste}$$

$$= (19{,}248.6)\ (0.8)$$

$$= 15{,}398.9 \text{ md-ft}$$

The average reservoir permeability using the total thickness of 133 feet was determined to be 115.8 md:

$$k = \frac{(kh)}{h}$$

$$= \frac{15{,}398.9}{133}$$

$$= 115.8 \text{ md}$$

To determine whether the pressure transient was indeed beyond the waste front, the travel time for the pressure transient to pass beyond the waste front was calculated. The distance to the waste front is determined from the following equation:

$$r_{waste} = \left(\frac{0.13368\ V}{\pi h \phi}\right)^{1/2}$$

Where:

r_{waste}	=	radius to waste front, feet
V	=	total volume injected into the injection interval, gallons
h	=	formation thickness, feet
ϕ	=	formation porosity, fraction
0.13368	=	constant

The time necessary for a pressure transient to travel this distance is calculated from the following equation:

$$t_{waste} = 948\frac{\phi\ \mu_{waste}\ c_t\ r^2{}_{waste}}{k}$$

Where:

t_{waste}	=	time for pressure transient to reach waste front, hours
ϕ	=	formation porosity, fraction
μ_{waste}	=	viscosity of the waste at reservoir conditions, centipoise
r_{waste}	=	radius to waste front, feet
c_t	=	total compressibility of the formation and fluid, psi
k	=	formation permeability, millidarcies
948	=	constant

Combining the previous two equations results in:

$$t_{waste} = 126.73\frac{\mathrm{V}\ \mu_{waste}\ c_t}{\pi k h}$$

The waste viscosity is 0.80 centipoise at reservoir conditions, while viscosity of brine in the reservoir is 1.34 centipoise. A cumulative volume of approximately 133,021,837 gallons of waste has been injected the injection interval (from both Well 1-12 & 2-12) since injection began. The formation has a porosity of 0.11 and a total compressibility of 6.20 x 10^{-6} psi^{-1}. The time necessary for a pressure transient to traverse the distance from the wellbore to the leading edge of the waste front, would then be 1.73 hours:

$$t = 126.73\frac{(133{,}021{,}837)(0.80)(6.20\ x\ 10^{-6})}{(\pi)(115.8)(133)}$$
$$= 1.73\ hours$$

Since the radial flow period occurred from 0.827 to 2.172 hours elapsed time following shut-in, most of the regime occurred in the injected waste (67.1%). Therefore, use of the injected waste viscosity in the analysis is valid.

The skin factor was determined from the following equation:

$$s = 1.151 \left[\frac{P_{wf} - P_{1hr}}{m} - \log\left(\frac{k}{\phi \, \mu \, c_t \, r_w^2} \right) + 3.23 \right]$$

Where,

s	=	formation skin damage at open perforations, dimensionless
1.151	=	constant
p_{wf}	=	flowing pressure immediately prior to shut-in, psia
p_{1hr}	=	pressure determined by extrapolating the radial flow semi-log line to a Δt of one hour, psi
m	=	slope of the radial flow semi-log line, psi/cycle
k	=	permeability of the formation, md
ϕ	=	porosity of the injection interval, fraction
μ	=	viscosity of the fluid the pressure transient is traveling through, centipoise
c_t	=	total compressibility of the formation plus fluid, psi^{-1}
r_w	=	radius of the wellbore, feet
3.23	=	constant

The final flowing pressure was 2131.75 psia. The pressure determined by extrapolating the radial flow semi-log line to a Δt of one hour, p_{1hr}, was 1893.64 psia. The porosity of the injection interval, ϕ, is 0.11 and the total compressibility, c_t, is 6.2 x 10^{-6} psi^{-1}. The wellbore radius, r_w, is 0.3646 feet. Using these values in addition to the previously determined parameters, m and k, results in a skin of 14.61:

$$s = 1.151 \left[\frac{2131.75 - 1893.64}{12.755} - \log\left(\frac{115.8}{(0.11)(0.8)(6.2 \, x \, 10^{-6})(0.3646)^2} \right) + 3.23 \right]$$

$$= 14.61$$

The change in pressure, Δp_{skin}, in the wellbore associated with the skin factor was determined to be 161.96 psi using the slope of the straight-line portion of the radial flow plot, the calculated skin factor, and the following equation:

Δp_{skin} = 0.869 ms

Where:

0.869	=	constant
m	=	slope from superposition plot of the well test, psi/cycle
s	=	skin factor calculated from the well test

Δp_{skin} = 0.869 (12.755) (14.61)

Δp_{skin} = 161.96 psi

The flow efficiency (E) was determined from the following equation:

$$E = \frac{p_{wf} - p^* - \Delta p_{skin}}{p_{wf} - p^*}$$

Where:

E	=	flow efficiency, fraction
p_{wf}	=	flowing pressure prior to shutting in the well for the falloff, 2131.75 psia
p^*	=	pressure extrapolated to an infinite shut-in time from the straight-line portion of the radial flow plot, 1879.95 psia
Δp_{skin}	=	pressure change due to skin damage, 161.96 psi

Substituting these values, the flow efficiency was calculated to be 0.357:

$$E = \frac{2131.75 - 1879.95 - 161.96}{2131.75 - 1879.95}$$

$$= 0.357$$

Table 5 presents a summary of calculated test data determined from the analysis.

Table 6 presents a summary of the results determined from the analysis.

6.0 BOTTOM-HOLE PRESSURE MEASUREMENT AND STATIC GRADIENT SURVEY

On August 9, 2024, a static gradient survey was performed while pulling the pressure gauges out of the well. Gradient stops were made at 4000 feet, 3000 feet, 2000 feet, 1000 feet 500 feet, and at the surface. The bottom-hole pressure and temperature, after approximately 19.9 hours of shut-in at 4080 feet, were 1881.04 psia (1881.04 psia = 1866.34 psig + 14.7 psi) and 73.16 °F, respectively. The data printout for the static gradient survey is presented as Appendix L. A tabulation of the survey results is provided as Table 6. The data are depicted graphically in Figure 9.

7.0 CONCLUSIONS

In conclusion, Republic Well No. 1-12 has mechanical integrity in accordance with 40 CFR 146.08 a (1) and in accordance with U.S. EPA Permit Number MI-168-1W-C010, and in accordance with the State of Michigan administrative rule R299.2393 (Michigan Permit Number #M-452) by demonstrating that:

- There is no significant leak in the casing, tubing or packer, as evidenced by an annulus pressure test conducted on August 6, 2024.
- The cement at the top of the injection interval has integrity and all injected fluids exited the injection tubing below the packer and moved out into the injection zone as demonstrated by the radioactive tracer log dated August 6, 2024.

With the submittal of this report, the ambient pressure monitoring and mechanical integrity testing conducted on Well 1-12 satisfies the United States Environmental Protection agency requirements which are included in the Class I UIC well permit number MI-163-1W-C0010

TABLES

TABLE 1

RADIOACTIVE TRACER SURVEY CHASE PASS SUMMARY

Chase Pass	Time Logged	Peak Slug Depth (ft KB)	Distance Traveled (ft)	Time Between Slugs (min)	Volume Between Slugs (gal)	Flow Rate (gpm)
1	15:45:33	3193.50				
2	15:51:06	3578.19	384.69	5.55	244.20	44
3	16:04:28	4118.40	540.21	13.37	588.28	44
4	16:23:03	4245.00	126.60	18.58	817.52	44

TABLE 2
GENERAL TEST INFORMATION

PARAMETER	VALUE	SOURCE/JUSTIFICATION
Dates of test	August 8-9, 2024	
Time since reservoir pressure was last stabilized	26.7 hours (after #2-12 buildup)	Republic plant records and Appendix B
Shut-in time prior to test	39.9 hours	Republic plant records and Appendix B
Stabilized pressure and temperature prior to test	N/A	
Cumulative injection into completed interval (gallons)	#1-12 .....68,023,576 #2-12 .....64,998,261 *Total: 133,021,837*	Republic plant records
Wellbore Radius (inches)	4.375	Figures 1 and 2
Completed Intervals (feet KB)	4,080 – 4,645 MD / 3,984 – 4,535 TVD	Figures 1 and 2
Type of Completion	Open-Hole	Figures 1 and 2
Depth to Fill (feet KB)	4,460	Tracer Survey conducted 08/06/24
Interval Thickness (feet)	133	No-Migration Petition Revision, Section VI (September 2002)
Average historical waste fluid viscosity	0.80	Estimated from Waste Stream Characteristics (30K TDS)
Formation fluid viscosity (cp)	1.34	No-Migration Petition Revision, Section VI (September 2002)
Porosity	11%	No-Migration Petition Revision, Section VI (September 2002)
Total Compressibility (psi^{-1})	6.20×10^{-6}	No-Migration Petition Revision, Section VI (September 2002)
Formation volume factor	1	Assumed since the dominant fluid is water
Initial formation bottom-hole pressures	1,779.5 psia @ 3,950’ KB MD / 3,856’ KB TVD	No-Migration Petition Revision, Section VI (September 2002)
Initial formation bottom-hole temperature	86.4 ˚F @ 3,950’ KB MD / 3,856’ KB TVD	No-Migration Petition Revision, Section VI (September 2002)

TABLE 3
INJECTION PERIOD

PARAMETER	VALUE	SOURCE/JUSTIFICATION
Time of injection period (hours)	11.11 hours	Republic Plant Records
Type of test fluid	Plant Effluent	
Final Injection rate (gpm)	44.04	Republic Plant Records
Pumps used for test	Facility Pump	
Distance from shut-in valve to wellhead	20 feet	Measured
Injection fluid viscosity (cp)	0.95	Estimated (based on Fresh Water @ 73 ˚F)
Injection fluid density (gm/cc)	1.00	Measured
Method and time viscosity tested	Not measured	
Final injection pressure	2,131.75 psia	Attachment 1
Gauge temperature at shut-in	68.77 ˚F	Attachment 1
Gauge type	Cal-Scan	Appendix D
Gauge model	Badger Low Temp, SN 91933	Appendix D
Gauge sensitivity	Accuracy: (0.024% FS) Resolution: (0.0003% FS)	Appendix D
Gauge depth (feet KB)	4,080	Appendix B & J
Manufacturer's recommend gauge calibration frequency	Annual	Appendix D

TABLE 4
FALL-OFF PERIOD

PARAMETER	VALUE
Total shut-in time	19.92 hours
Final shut-in pressure	1,881.04 psia
Final shut-in temperature	73.16 ˚F

TABLE 5
CALCULATED TEST DATA

CALCULATED PARAMETER	VALUE
Time to Waste Front (hours)	1.73
Time of Radial Flow Regime (hours)	0.827 – 2.172
Time to End of Wellbore Storage (hours)	0.0073
Radial Flow (Horner) Time at End of Wellbore Storage	1,478.96
Slope of Straight-Line Portion of Radial Flow Plot (psi/cycle)	12.755
Injection Reservoir Transmissibility (md-ft/cp)	19,248.6
Permeability (md)	115.8
Skin Factor (dimensionless)	14.61
Pressure Loss @ 44.04 gpm Due to Skin Damage (psi)	161.96
Flow Efficiency (fraction)	0.357

TABLE 6
SUMMARY OF PANSYSTEM FALL-OFF ANALYSIS

SOURCE	PARAMETER	1-12 VALUE	UNITS
Log-Log and Derivative Information	Total Shut-in Time	19.92	hours
	Derivative Smoothing Factor	0.070	
	Radial Flow Period (elapsed)	0.827 – 2.172	hours
Information from Superposition Plot	Slope of Semi-Log Straight Line	12.755	psi/cycle
	Pressure at Infinite Shut-in Time	1879.95	psia
	Pressure at 1-hour from Shut-in (Extrapolation of Semi-Log Straight Line)	1893.64	psia
Semi-Log Analysis	Mobility Thickness	19,244.1	md-ft/cp
	Permeability Thickness	15,395.3	md-ft
	Permeability	115.8	md
	Formation Skin Damage	14.66	-

TABLE 7

STATIC PRESSURE GRADIENT SURVEY

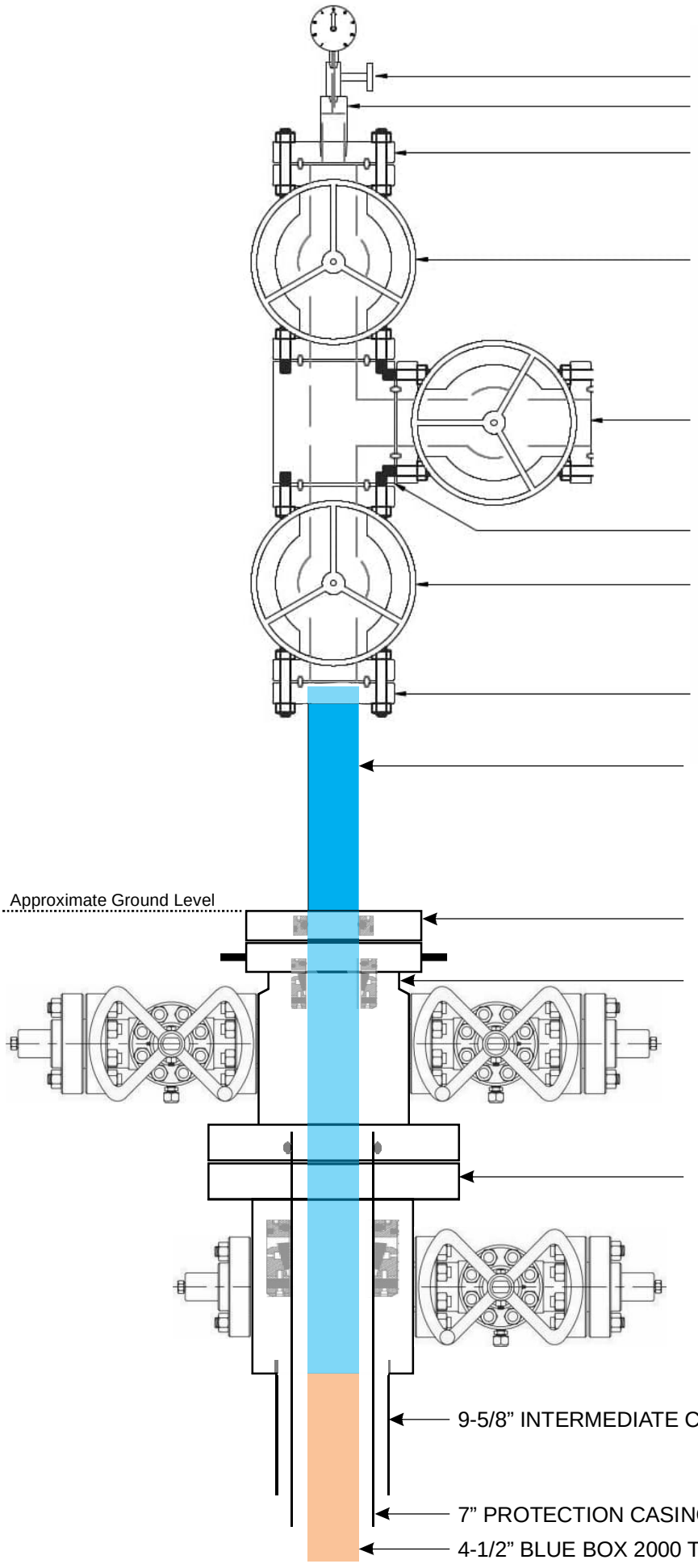
WELL No. 1-12

August 9, 2024

Memory Gauge Serial No. 91933			
Depth (feet)	Pressure (psig)	Pressure Gradient (psi/ft)	Temperature (ºF)
0	142.86	-	71.96
1000	570.73	0.428	59.10
2000	999.68	0.429	63.15
3000	1409.53	0.410	72.85
4000	1831.82	0.422	78.01
4080	1866.34	0.432	73.16

FIGURES

FIGURE 1



WSP USA, Inc.
16200 Park Row Ste. 200
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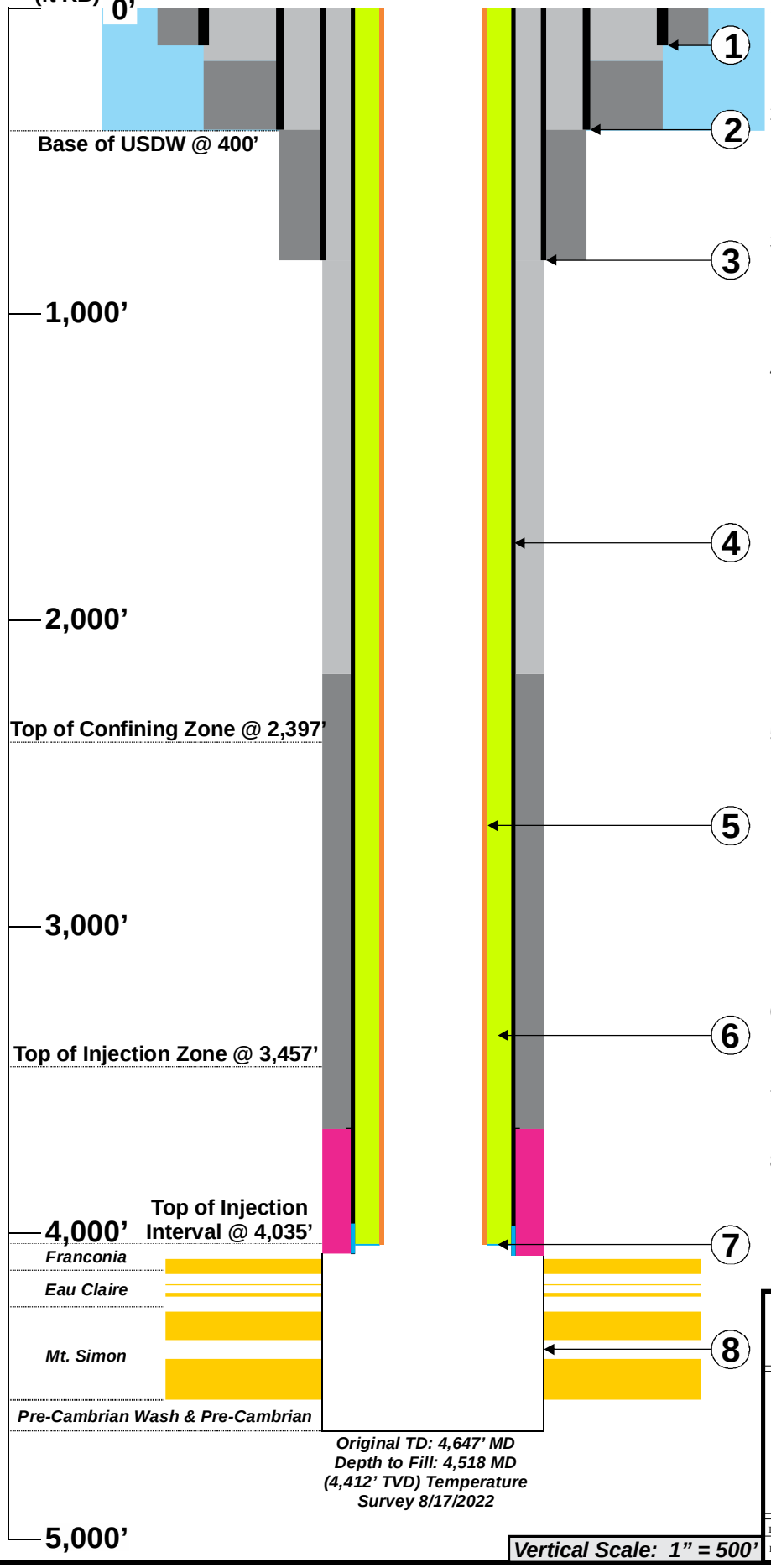
FIGURE 4.1-2

REPUBLIC INDUSTRIAL AND ENERGY SOLUTIONS LLC
ROMULUS, MICHIGAN

WELLHEAD SKETCH
EDS WELL #1-12

DATE 11/17/2023	CHECKED BY JHL	JOB NO. 192128AF
DRAWN BY WDD	APPROVED BY SLK	DWG NO.

FIGURE 2



BELOW GROUND DETAILS

1. Conductor Casing: 20", H-40 set in a 24" borehole at 119'. Cemented with 200 sacks of Class A cement containing 3% $CaCl_2$ with 75% returns. Top 50' of annulus cemented with 50 sacks of Class A.
2. Surface Casing: 13-3/8", H-40 set in a 17-1/2" borehole at 405'. Cemented with 75 sacks of Lite lead cement with 3% $CaCl_2$ followed by 150 sacks of Class A tail cement with 3% $CaCl_2$. Top of annulus cemented with 175 sacks of Class A cement with 3% $CaCl_2$.
3. Intermediate Casing: 9-5/8", 36 lb/ft set in a 12-1/4" borehole at 824'. Cemented with 150 sacks of Lite lead with 3% $CaCl_2$ followed by 200 sacks of Class A tail with 3% $CaCl_2$. Approximately 10 bbl of cement circulated to the surface.
4. Protection Casing: 7", 26 lb/ft, K-55, LT&C set in an 8-3/4" borehole to 3,977' and 7", 1/4" wall, Hastelloy C-276, STL set in 8-3/4" borehole from 3,977' to 4,075' with 7" float collar and float shoe set from 4,075' to 4,080. Cement diverter tool set in 7" casing from 3,657' to 3,660'.
   Stage I (3,660' to 4,080'):
   686 gallons (16.3 bbl) of EPSEAL epoxy cement.
   Stage II (Surface to 3,660'):
   500 sacks of 50/50 Standard Pozmiz lead cement with 2% gel, 0.4% HALAD 344 and 3% salt followed by 450 sacks of Standard Class A tail cement containing 3% HALAD 322, 0.4% HALAD 344, 8.2% Microbond, and 2.14% salt.
5. Injection Tubing: 4-1/2", Blue Box 2000, fiberglass tubing to top of packer at 4,036' (4.78', 4-1/2" Hastelloy C-276 landing joint top positioned 1-1/2' above ground level with 4' of stretch. Landing Joint base = 16.28' KB:
   a) 3 Pup Joints (3.64' + 1.72' + 3.60' = 8.96'), 4-1/2", Blue Box FRP;
   b) 4-1/2", Blue Box FRP tubing (137 joints x 29.249'/joint = 4,007.08'
   c) Anchor Seal Assembly, 4.75" x 3.75", Hastelloy C-276, 1.64' long set in Model 12 Injection Packer PBR from 4,036.32' to 4,037.96'.
6. Annulus Fluid: 68.5 bbl (2,877 gallons) of 10 lb/gal brine water containing a corrosion inhibitor, a bactericide and an oxygen scavenger.
7. Injection Packer: Model 12, Hastelloy C-276 wetted parts set from 4,036.3' to 4,041.4'. Polished test bore = 3.50" at packer base.
8. Open Hole Completion: 8-3/4" borehole from 4,080' to 4,645' (TVD = 4,535' @ 4,645' MD).

Bottom-hole location: 211' south and 754' west of surface location (782.97, South 74° 21' 58.35" West)

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FIGURE 4.1-1

REPUBLIC INDUSTRIAL AND ENERGY SOLUTIONS LLC
ROMULUS, MICHIGAN

BELOW GROUND DETAILS
EDS WELL #1-12

DATE 11/17/2023	CHECKED BY JHL	JOB NO. 192128AF	
DRAWN BY WDD	APPROVED BY SLK	DWG NO.	

Annulus Pressure Test
Well 1-12
August 6, 2024

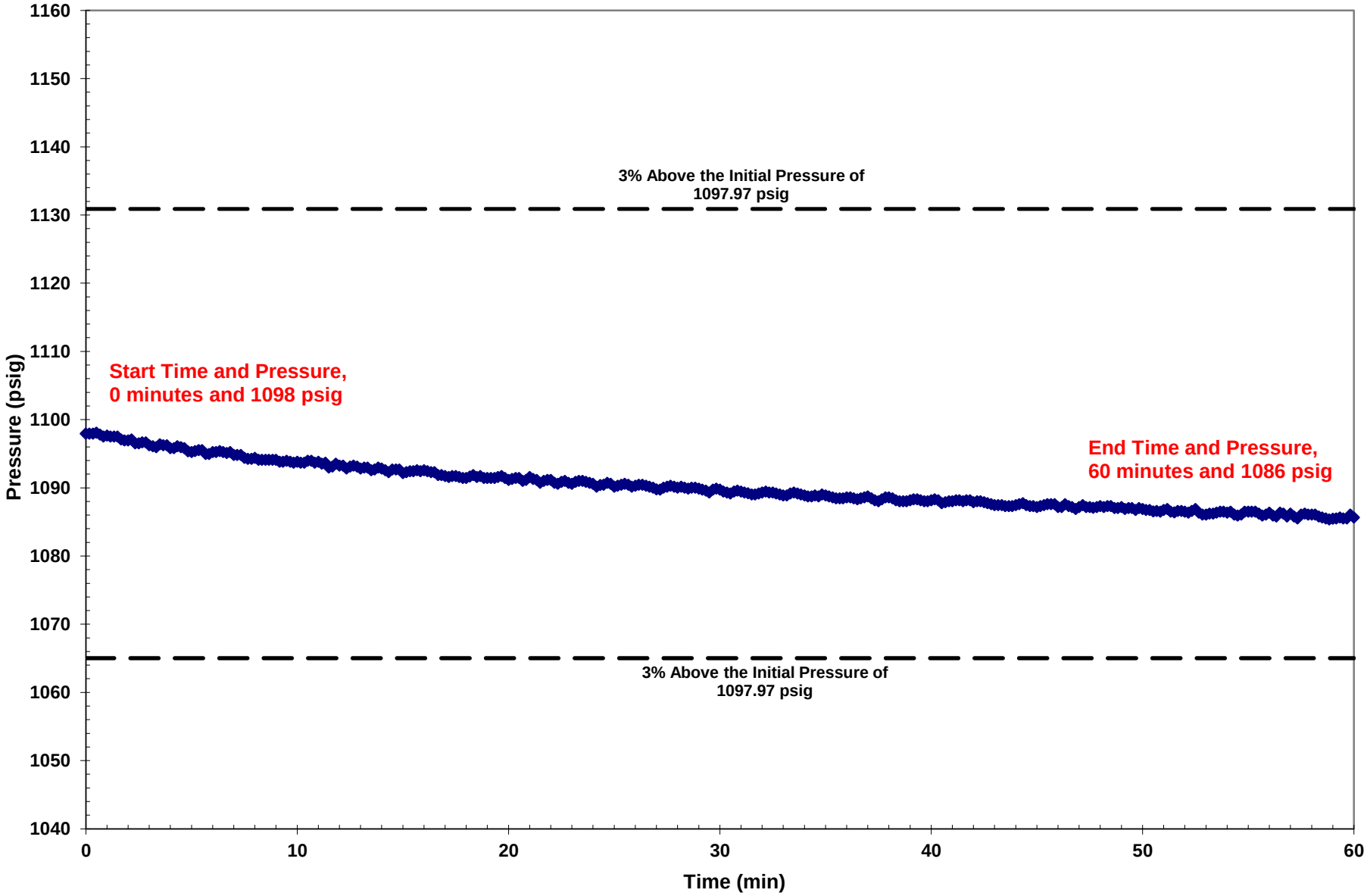


FIGURE 3

Figure 4: Well 1-12 2024 PFO Test Overview Plot

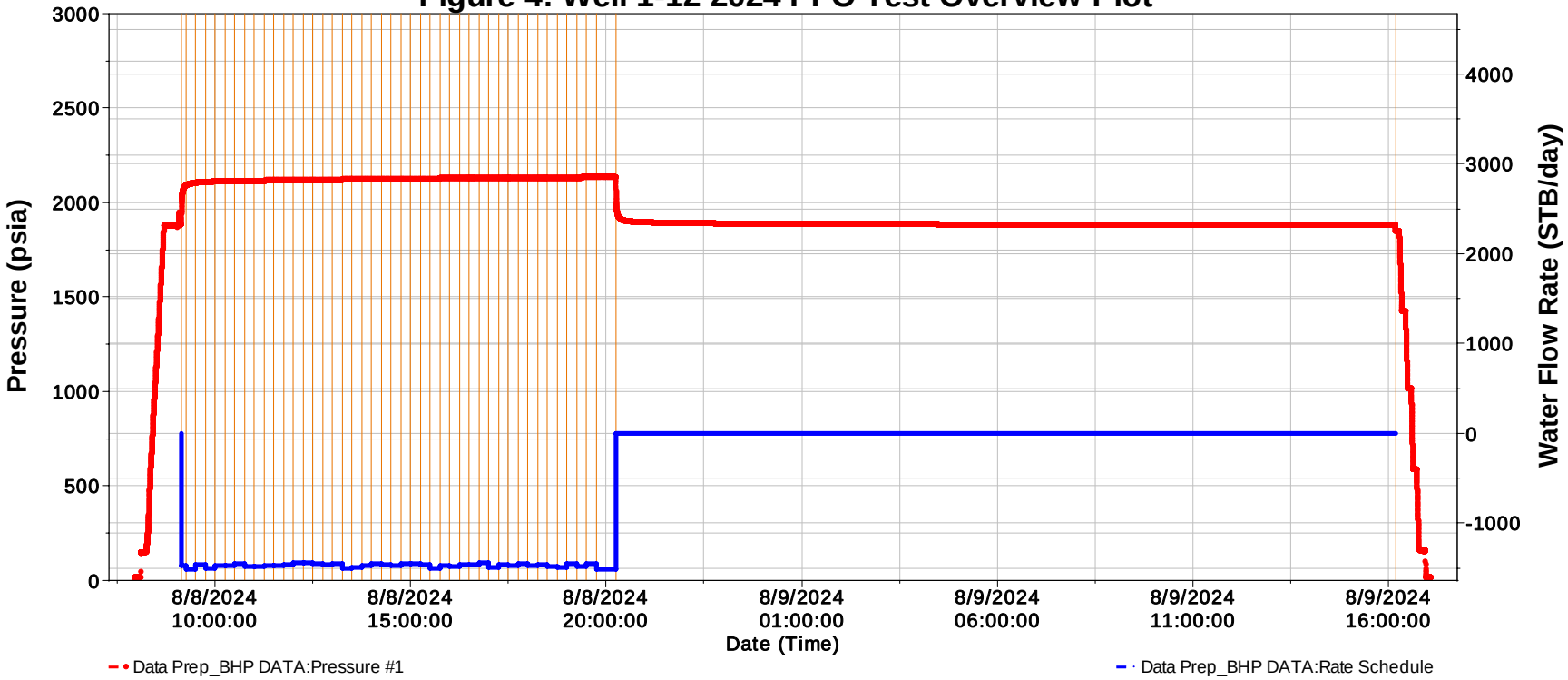


Figure 5: Well 1-12 2024 PFO Cartesian Plot

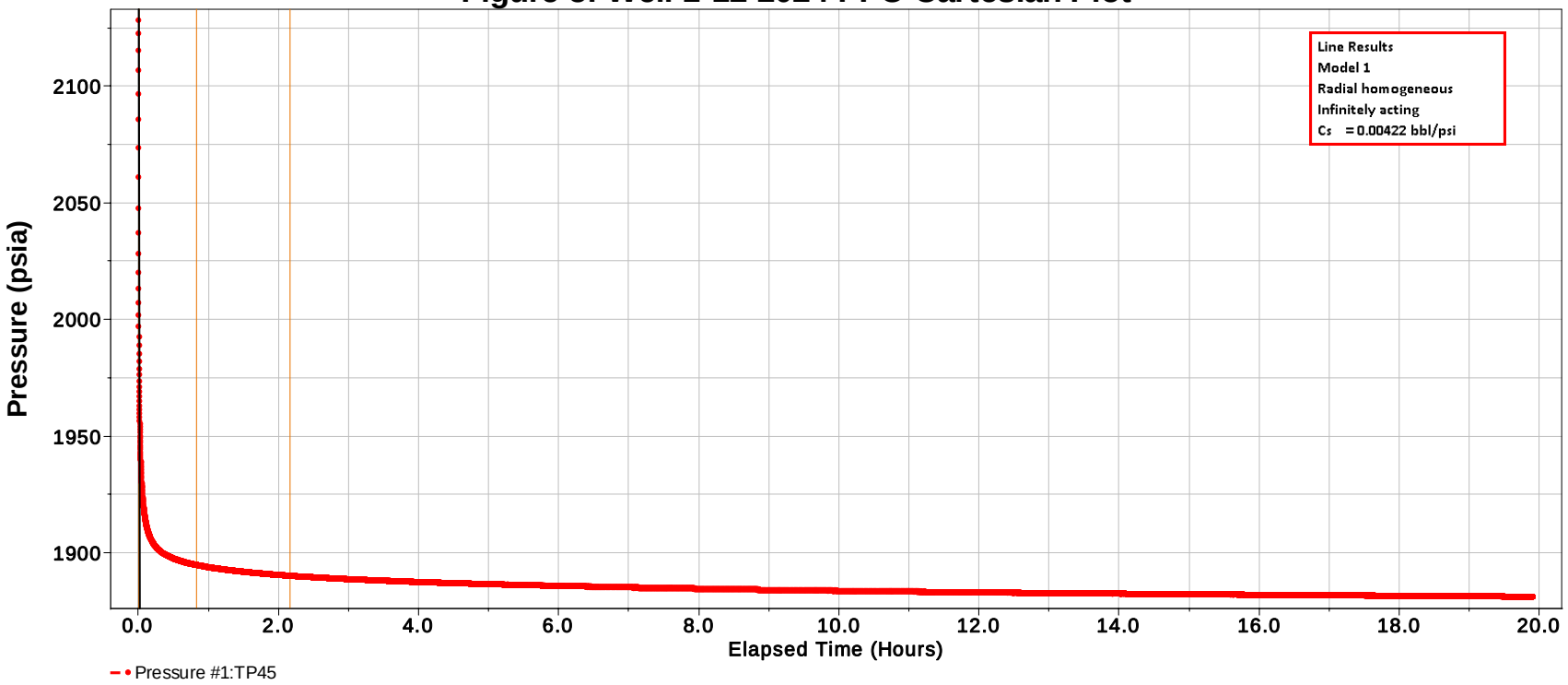


Figure 6: Well 1-12 2024 PFO Log-Log Plot

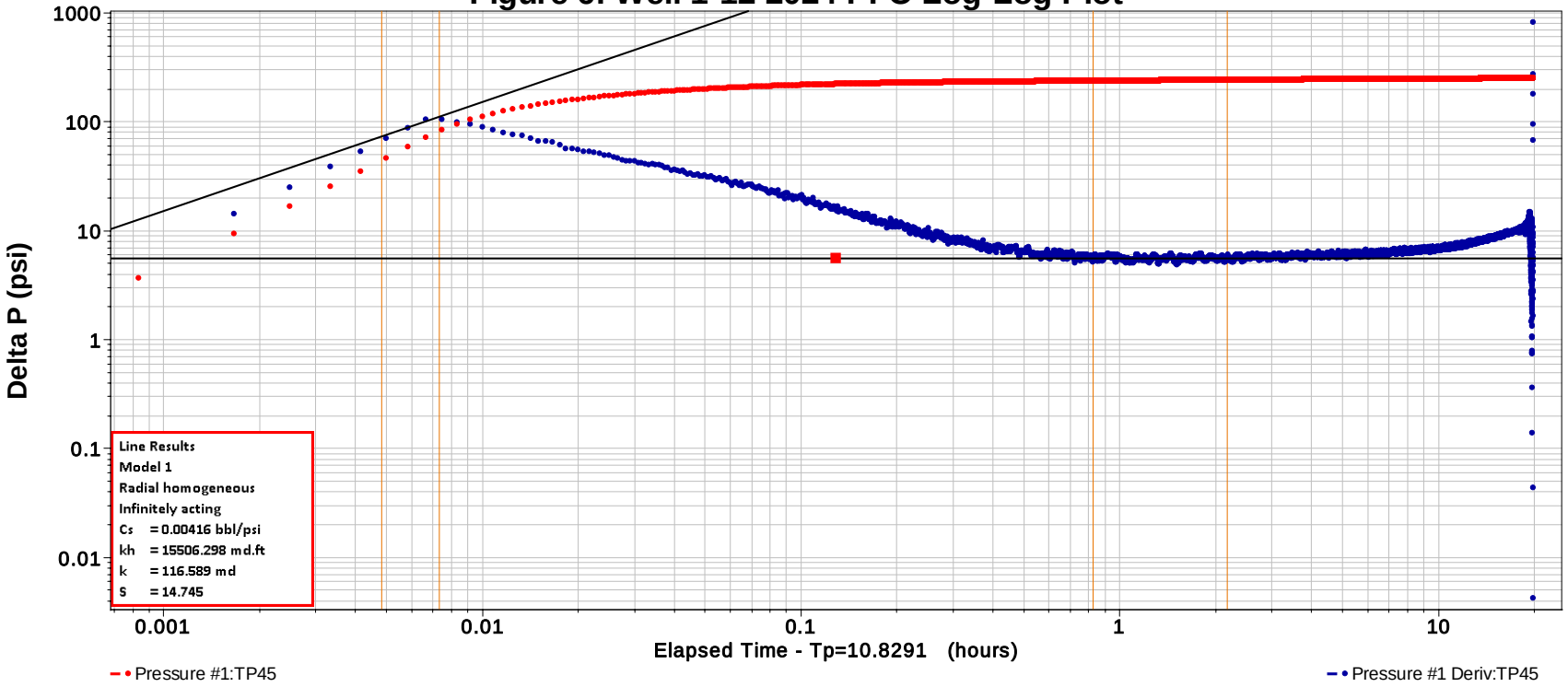


Figure 7: Well 1-12 2024 PFO Radial Flow Plot

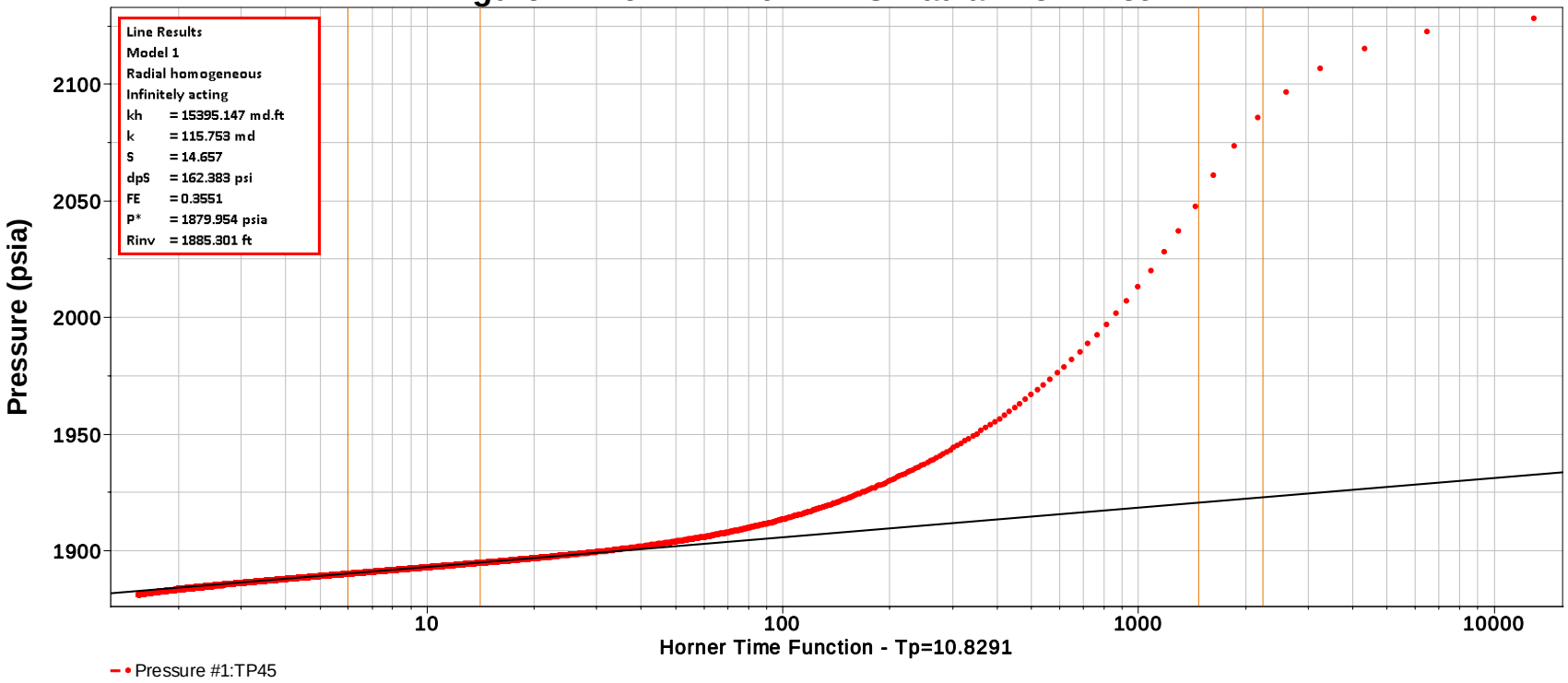
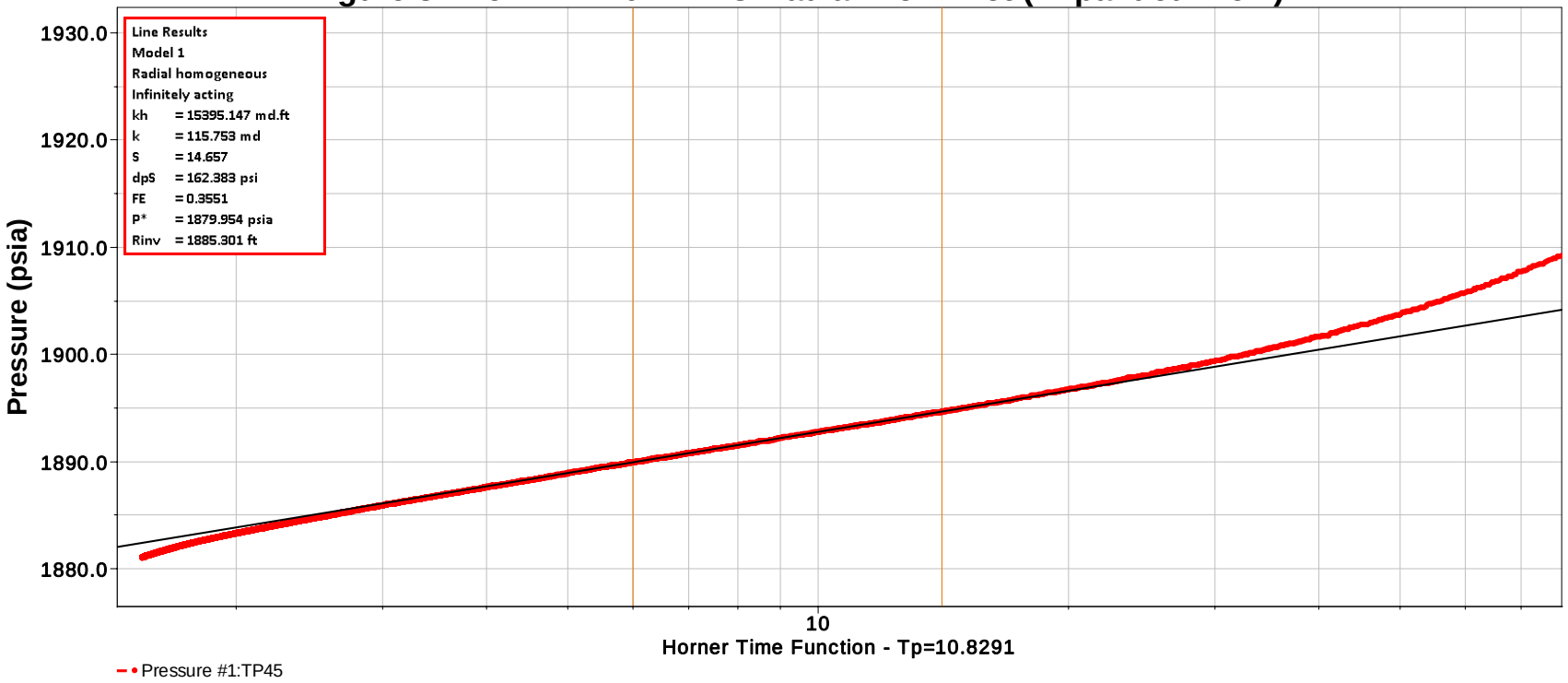


Figure 8: Well 1-12 2024 PFO Radial Flow Plot (Expanded View)



STATIC PRESSURE GRADIENT SURVEY
WELL No. 1-12
August 9, 2024

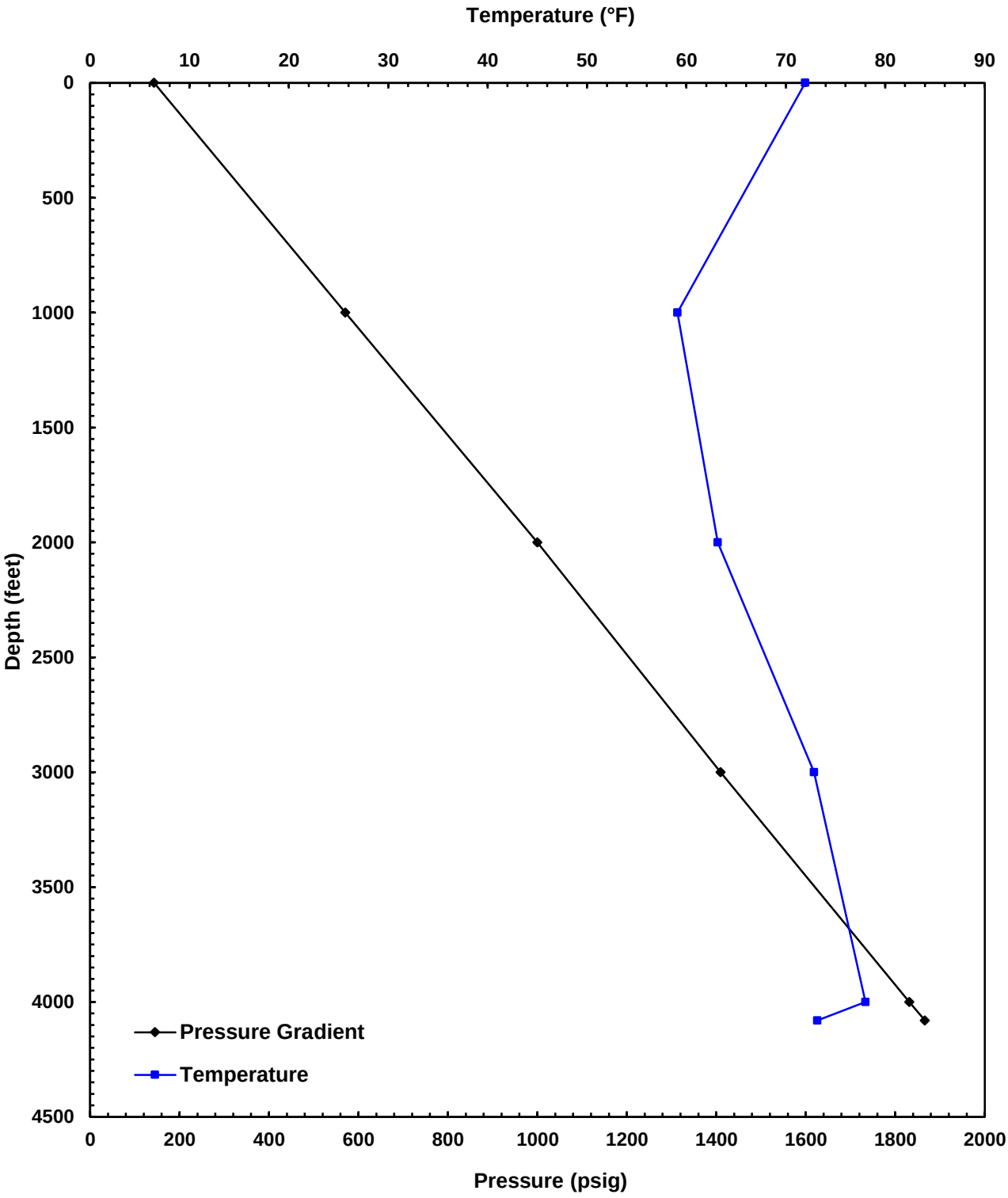


FIGURE 9

APPENDICES

APPENDIX A

REGULATORY CORRESPONDENCE

Mackinnon, James

From: R5UICWellTesting <R5UICWellTesting@epa.gov>
Sent: Tuesday, July 30, 2024 11:33 AM
To: Mackinnon, James
Cc: Greenhagen, Andrew (he/him/his); Quinlan, Kaelyn (she/they); R5UICWellTesting
Subject: RE: Annual MIT Republic Services Romulus MI
Attachments: FOT.pdf; RTS.pdf

Mr. Mackinnon,

EPA has reviewed the procedures you proposed on July 5, 2024, for radioactive tracer surveys and fall off tests in Republic Services in Romulus, Michigan on Well Nos. 1-12 (EPA UIC Permit #MI-163-1W-C010) and 2-12 (EPA UIC Permit #MI-163-1W-C011). Your proposed procedures are hereby approved unless you receive additional email correspondence in the next three business days from Andrew Greenhagen approving the procedures with conditions or disapproving the procedures.

A blank test information sheet is attached to this email – please complete and return it for each test when you submit your report. Please note all the items listed under "Remember" at the bottom of the information sheet. These items will help ensure that all the information we require for interpretation of the test will be included in your submission. Please remember to submit the digital data by email when you submit your report. If a test does not provide definitive information concerning the conditions which it is designed to ascertain, or approved procedures are not followed, you will be required to rerun the test.

It is our practice that testing be witnessed by our contract field inspector to the extent possible. If you have not already done so, please contact Felicia Chase at chase.felicia@epa.gov to schedule the witnessing of these tests. Unwitnessed tests are only acceptable if it is impossible for the field inspector to be present.

If you have any questions or if you find during a test that you are unable to follow the approved procedures, please contact Kaelyn Quinlan at (312) 886-7188 or quinlan.kaelyn@epa.gov.

Please note: We have established an additional email address of R5UICWellTesting@epa.gov. You may now send all correspondence relating to well test witness scheduling, procedure approvals, and electronic report/data submissions to this inbox. At this time, EPA still requires a copy of the test report via paper with appropriate signature for the permanent file.

R5UICWellTesting@epa.gov
Water Division, Permits Branch, UIC Section
U.S. Environmental Protection Agency - Region 5
77 West Jackson Boulevard, WP-16J
Chicago, Illinois 60604

From: Mackinnon, James <JMackinnon@republicservices.com>
Sent: Monday, July 29, 2024 4:05 PM
To: R5UICWellTesting <R5UICWellTesting@epa.gov>

Cc: Greenhagen, Andrew (he/him/his) <Greenhagen.Andrew@epa.gov>; Quinlan, Kaelyn (she/they) <Quinlan.Kaelyn@epa.gov>
Subject: RE: Annual MIT Republic Services Romulus MI

> **Caution:** This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Hello,

Please find the procedure attached. We will be completing an annulus pressure test, a tracer survey, and pressure fall off test.

James Mackinnon, CHMM
Engineering Leadership Trainee Industrial Wells
e JMackinnon@republicservices.com
o
c 734-406-5712

From: R5UICWellTesting <R5UICWellTesting@epa.gov>
Sent: Friday, July 26, 2024 8:58 AM
To: Mackinnon, James <JMackinnon@republicservices.com>
Cc: R5UICWellTesting <R5UICWellTesting@epa.gov>; Greenhagen, Andrew (he/him/his) <Greenhagen.Andrew@epa.gov>; Quinlan, Kaelyn (she/they) <Quinlan.Kaelyn@epa.gov>
Subject: RE: Annual MIT Republic Services Romulus MI

Good afternoon James,

Thank you for reaching out. Please specify the related testing that will be conducted with the Annual Pressure Falloff Test on August 6, 2024. In addition, no procedures were attached in the previous email notification sent on July 5, 2024. Can you please confirm that any testing proposed will be conducted according to the previous procedures provided on July 10, 2023? However, if there is any deviation from the prior procedures, please provide in detail.

Best,

R5UICWellTesting@epa.gov
Water Division, Permits Branch, UIC Section
U.S. Environmental Protection Agency - Region 5
77 West Jackson Boulevard, WP-16J
Chicago, Illinois 60604

From: Mackinnon, James <JMackinnon@republicservices.com>
Sent: Friday, July 5, 2024 4:01 PM
To: Greenhagen, Andrew (he/him/his) <Greenhagen.Andrew@epa.gov>; Chase, Felicia <chase.felicia@epa.gov>; Frost,

John <JFrost@republicservices.com>; Rodriquez, Tom <TRodriquez@republicservices.com>; Odrowski, Brendan <BOdrowski@republicservices.com>; Mcbride, Andrew <AMcbride2@republicservices.com>
Cc: Scott, Sylwia <SScott@republicservices.com>
Subject: Annual MIT Republic Services Romulus MI

Mr. Greenhagen,

My name is James Mackinnon and I am an engineer on site at Republic Services in Romulus, Michigan. It is our intention to conduct our Annual Pressure Falloff Test and related testing beginning August 6th, 2024, for wells 1-12 and 2-12.

Please let us know if you have any questions

James Mackinnon, CHMM
Engineering Leadership Trainee Industrial Wells
e JMackinnon@republicservices.com
o
c 734-406-5712

INTRODUCTION

The following procedures comply with the requirements of EPA, Region 5 for annual mechanical integrity tests on a Class I hazardous waste disposal well.

The following are the objectives of the 2024 Annual Mechanical Integrity Tests:

- Conduct a 1-Hour Annulus Pressure Test at a pressure of approximately 1,100 psi.
- Run a Radioactive Tracer Survey.
- Return well to normal service.
- Prepare a Mechanical Integrity Test Report and submit to the UIC groups of EPA, Region 5 and Michigan EGLE.

A. ANNULUS PRESSURE TEST PROCEDURE

1. Notify the EPA, Region 5 and the Michigan EGLE at least 48 hours prior to initiating the annual mechanical integrity tests on Well 1-12.
2. Shut-in Well 1-12 at least 36 hours prior to conducting an Annulus Pressure Test (APT).
3. Record the last date of injection into Well 1-12.
4. Install a certified digital pressure gauge to the annulus and have a Calibration Certificate available on site that demonstrates the pressure gauge was calibrated within the past 12 months.
5. Pressurize the annulus to approximately 1,100 psi.
6. Allow the annulus pressure to stabilize. If necessary, depressurize and bleed line to gauge to remove any trapped air and repressurize.
7. Isolate the annulus pressure on the well from the Well Annulus Monitoring System by closing the necessary valves.
8. Record the Initial Annulus Pressure to begin the 1-hour APT.
9. Continue recording the annulus pressure at 10-minute intervals for at least 60 minutes or as instructed by the regulatory agency inspector witnessing the test. A successful APT will not fluctuate more than 3% of the initial test pressure during the 1-hour test period.
10. Release the pressure from the annulus by bleeding the excess annulus fluid into the Well Annulus Monitoring System storage tank and note the change in the tank level. If requested, perform annual alarm testing.
11. Provide the regulatory agency inspector with a copy of the data recorded during the APT and the pressure gauge calibration certificate.

B. RADIOACTIVE TRACER SURVEY PROCEDURE

1. Republic will use its pump and fresh water to conduct the RAT Survey.
2. Well to be shut-in, run in the well with a dual gamma ray detector tool that has a collar locator and an ejector tool filled with $Iodine_{131}$ radioactive material positioned above the gamma ray detectors.
3. After correlating the log with previous logs run in the well, tag bottom and run a pre-survey base gamma ray log from the total depth reached to approximately 3,000 feet.
4. Run 5-minute statistical checks in the time drive logging mode at 3,955 feet and 3,802 feet.
5. Start injection into the well at approximately 42 gpm (1 bpm). This will provide a fluid velocity of 65 ft/min in the tubing and a maximum velocity of approximately 12 ft/min in the open hole completion interval.
6. Release a slug of radioactive material at 3,100 feet while continuing to inject into the well at 1 bpm.
7. Drop the tool string down and record a log through the radioactive slug as it travels downhole. Make at least two logging passes through the moving slug before it reaches the injection packer at 4,036 feet. (At an injection rate of 1 bpm, slug will take approximately 15 minutes to reach the packer after ejection.)
8. Continue logging the movement of the slug as it enters the open hole completion at a reduced velocity (maximum velocity = approximately 12 fpm at 1 bpm). Make additional logging passes through the slug until it has dissipated into the injection interval.
9. Pull the logging tool up to approximately 3,750 feet while continuing to inject at 1 bpm. Release a slug of $Iodine_{131}$ at 3,750 feet. Drop the tool downhole and position the bottom detector at approximately 4,050 feet and begin recording a time drive survey. (Slug will be traveling at approximately 65 ft/min and will take about 4.6 minutes to reach tool from the time it was ejected.)
10. Record a time drive survey for at least 30 minutes while continuing to inject at approximately 1 bpm.
11. Following the time drive survey, cease injection, tag bottom with the tool and run a post-survey base gamma ray log from the total depth reached to 3,000 feet.
12. Pull out of the hole with the tool and rig down and move out the wireline unit, pump truck and associated equipment.
13. Return the well to normal operation.
14. Prepare a Mechanical Integrity Report and submit to the UIC groups of the EPA, Region 5 and the Michigan EGLE.

ATTACHMENTS

- Figure 1: Wellhead Sketch
- Figure 2: Below Ground Details

PREPARED BY Jeffry Tahtouh 07-05-2024

wsp	**2024** ANNUAL RESERVOIR PRESSURE MONITORING (INJECTION – FALLOFF) TEST PROCEDURE	Project No. 192128.0156
	Republic Services Romulus, MI Facility Well 1-12; API No. 21-163-M452	Date 07/05/24
		Page 1 of 1

INTRODUCTION

The following procedure complies with the requirements of EPA, Region 5 for an annual reservoir pressure monitoring (injection – falloff) test of a Class I hazardous waste disposal well.

The following are the objectives of the 2024 Annual Reservoir Pressure Monitoring (Injection – Falloff) Test:

- Initiate injection into Well 1-12 at a constant rate. Terminate injection into Well 2-12 prior to the injection test into Well 1-12.
- Position dual memory gauges in Well 1-12 with the bottom gauge located at 4,080 feet KB.
- Inject fresh water into Well 1-12 at a constant rate for approximately 12 hours.
- Terminate injection into Well 1-12 no sooner than 1 hour after positioning bottomhole gauges in well and record the pressure falloff for approximately 24 hours.
- Return well 1-12 to normal service.
- Prepare a Reservoir Pressure Monitoring (Injection – Falloff) Test Report and submit to the UIC groups of EPA, Region 5 and Michigan EGLE. Include the raw pressure data with the report and the pressure gauge calibration certificate.

RESERVOIR PRESSURE MONITORING (INJECTION – FALLOFF) TEST PROCEDURE

1. Rig up slickline unit with mast and lubricator. Run in the hole with calibrated tandem pressure gauges and position the bottom gague at 4,080 feet KB. Record the bottomhole shut-in pressure for approximately 1 hour.
2. With Well 2-12 shut-in, initiate injection into Well 1-12 at a constant rate (±5%) using fresh water and the facility pump. Record the injection data during the test.
3. After approximately 12 hours of constant injection with a constant fluid density, terminate injection and shut-in the wing-valve near the well.
4. Record the pressure falloff data for approximately 24 hours.
5. Remove the pressure gauges from the well taking 5-minute gradient stops at 1,000-foot intervals. Download the pressure and temperature data at the surface.
6. Rig down and move out the slickline unit.
7. Analyze the data using PanSystem software and prepare a final report and submit to the UIC groups of EPA, Region 5 and Michigan EGLE. Include the raw pressure data with the report and the calibration certificate for the pressure gauges.

ATTACHMENTS

Figure 1: Wellhead Sketch

Figure 2: Below Ground Details

PREPARED BY Jeffry Tahtouh 07-05-2024

Revision No. 0

INTRODUCTION

The following procedures comply with the requirements of EPA, Region 5 for annual mechanical integrity tests on a Class I hazardous waste disposal well.

The following are the objectives of the 2024 Annual Mechanical Integrity Tests:

- Conduct a 1-Hour Annulus Pressure Test at a pressure of approximately 1,100 psi.
- Run a Radioactive Tracer Survey.
- Return well to normal service.
- Prepare a Mechanical Integrity Test Report and submit to the UIC groups of EPA, Region 5 and Michigan EGLE.

A. ANNULUS PRESSURE TEST PROCEDURE

1. Notify the EPA, Region 5 and the Michigan EGLE at least 48 hours prior to initiating the annual mechanical integrity tests on Well 2-12.
2. Shut-in Well 2-12 at least 36 hours prior to conducting an Annulus Pressure Test (APT).
3. Record the last date of injection into Well 2-12.
4. Install a certified digital pressure gauge to the annulus and have a Calibration Certificate available on site that demonstrates the pressure gauge was calibrated within the past 12 months.
5. Pressurize the annulus to approximately 1,100 psi.
6. Allow the annulus pressure to stabilize. If necessary, depressurize and bleed line to gauge to remove any trapped air and repressurize.
7. Isolate the annulus pressure on the well from the Well Annulus Monitoring System by closing the necessary valves.
8. Record the Initial Annulus Pressure to begin the 1-hour APT.
9. Continue recording the annulus pressure at 10-minute intervals for at least 60 minutes or as instructed by the regulatory agency inspector witnessing the test. A successful APT will not fluctuate more than 3% of the initial test pressure during the 1-hour test period.
10. Release the pressure from the annulus by bleeding the excess annulus fluid into the Well Annulus Monitoring System storage tank and note the change in the tank level. If requested, perform annual alarm testing.
11. Provide the regulatory agency inspector with a copy of the data recorded during the APT and the pressure gauge calibration certificate.

B. RADIOACTIVE TRACER SURVEY PROCEDURE

1. Republic will use its pump and fresh water to conduct the RAT Survey.
2. Well to be shut-in, run in the well with a dual gamma ray detector tool that has a collar locator and an ejector tool filled with $Iodine_{131}$ radioactive material positioned above the gamma ray detectors.
3. After correlating the log with previous logs run in the well, tag bottom and run a pre-survey base gamma ray log from the total depth reached to approximately 3,000 feet.
4. Run 5-minute statistical checks in the time drive logging mode at 3,855 feet and 3,800 feet.
5. Start injection into the well at approximately 42 gpm (1 bpm). This will provide a fluid velocity of 65 ft/min in the tubing and a maximum velocity of approximately 12 ft/min in the open hole completion interval.
6. Release a slug of radioactive material at 3,100 feet while continuing to inject into the well at 1 bpm.
7. Drop the tool string down and record a log through the radioactive slug as it travels downhole. Make at least two logging passes through the moving slug before it reaches the injection packer at 3,930 feet. (At an injection rate of 1 bpm, slug will take approximately 15 minutes to reach the packer after ejection.)
8. Continue logging the movement of the slug as it enters the open hole completion at a reduced velocity (maximum velocity = approximately 12 fpm at 1 bpm). Make additional logging passes through the slug until it has dissipated into the injection interval.
9. Pull the logging tool up to approximately 3,750 feet while continuing to inject at 1 bpm. Release a slug of $Iodine_{131}$ at 3,750 feet. Drop the tool downhole and position the bottom detector at approximately 3,960 feet and begin recording a time drive survey. (Slug will be traveling at approximately 65 ft/min and will take about 4.6 minutes to reach tool from the time it was ejected.)
10. Record a time drive survey for at least 30 minutes while continuing to inject at approximately 1 bpm.
11. Following the time drive survey, cease injection, tag bottom with the tool and run a post-survey base gamma ray log from the total depth reached to 3,000 feet.
12. Pull out of the hole with the tool and rig down and move out the wireline unit, pump truck and associated equipment.
13. Return the well to normal operation.
14. Prepare a Mechanical Integrity Report and submit to the UIC groups of the EPA, Region 5 and the Michigan EGLE.

ATTACHMENTS

- Figure 3: Wellhead Sketch
- Figure 4: Below Ground Details

PREPARED BY Jeffry Tahtouh 07-05-2024

wsp	2024 ANNUAL RESERVOIR PRESSURE MONITORING (INJECTION – FALLOFF) TEST PROCEDURE	Project No. 192128.0156
	Republic Services Romulus, MI Facility Well 2-12; API No. 21-163-M453	Date 07/05/24
		Page 1 of 1

INTRODUCTION

The following procedure complies with the requirements of EPA, Region 5 for an annual reservoir pressure monitoring (injection – falloff) test of a Class I hazardous waste disposal well.

The following are the objectives of the 2024 Annual Reservoir Pressure Monitoring (Injection – Falloff) Test:

- Initiate injection into Well 2-12 at a constant rate. Terminate injection into Well 1-12 prior to the injection test into Well 2-12.
- Position dual memory gauges in Well 2-12 with the bottom gauge located at 3,975 feet KB.
- Inject fresh water into Well 2-12 at a constant rate for approximately 12 hours.
- Terminate injection into Well 2-12 no sooner than 1 hour after positioning bottomhole gauges in well and record the pressure falloff for approximately 24 hours.
- Return well 2-12 to normal service.
- Prepare a Reservoir Pressure Monitoring (Injection – Falloff) Test Report and submit to the UIC groups of EPA, Region 5 and Michigan EGLE. Include the raw pressure data with the report and the pressure gauge calibration certificate.

RESERVOIR PRESSURE MONITORING (INJECTION – FALLOFF) TEST PROCEDURE

1. Rig up slickline unit with mast and lubricator. Run in the hole with calibrated tandem pressure gauges and position the bottom gague at 3,975 feet KB. Record the bottomhole shut-in pressure for approximately 1 hour.
2. With Well 1-12 shut-in, initiate injection into Well 2-12 at a constant rate (±5%) using fresh water and the facility pump. Record the injection data during the test.
3. After approximately 12 hours of constant injection with a constant fluid density, terminate injection and shut-in the wing-valve near the well.
4. Record the pressure falloff data for approximately 24 hours.
5. Remove the pressure gauges from the well taking 5-minute gradient stops at 1,000-foot intervals. Download the pressure and temperature data at the surface.
6. Rig down and move out the slickline unit.
7. Analyze the data using PanSystem software and prepare a final report and submit to the UIC groups of EPA, Region 5 and Michigan EGLE. Include the raw pressure data with the report and the calibration certificate for the pressure gauges.

ATTACHMENTS

Figure 3: Wellhead Sketch

Figure 4: Below Ground Details

PREPARED BY Jeffry Tahtouh 07-05-2024

Revision No. 0

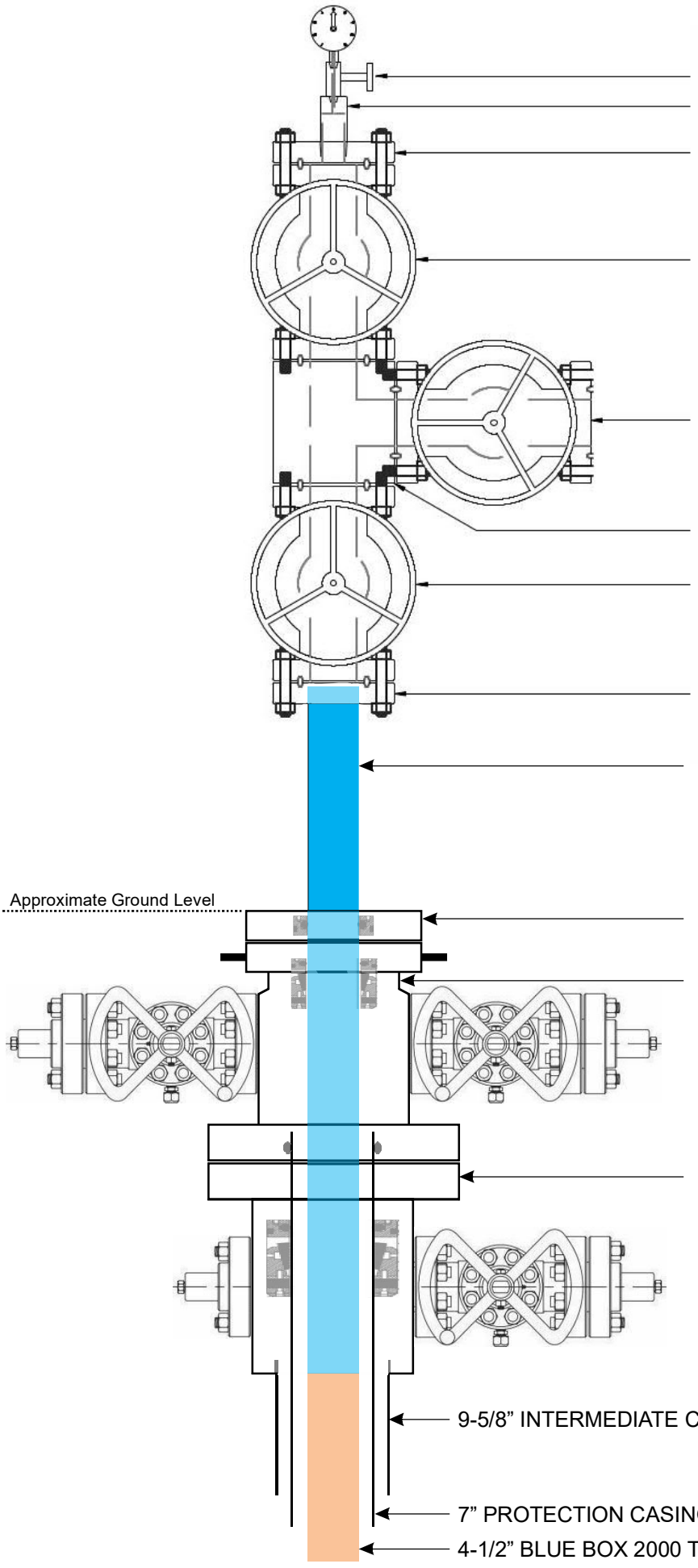


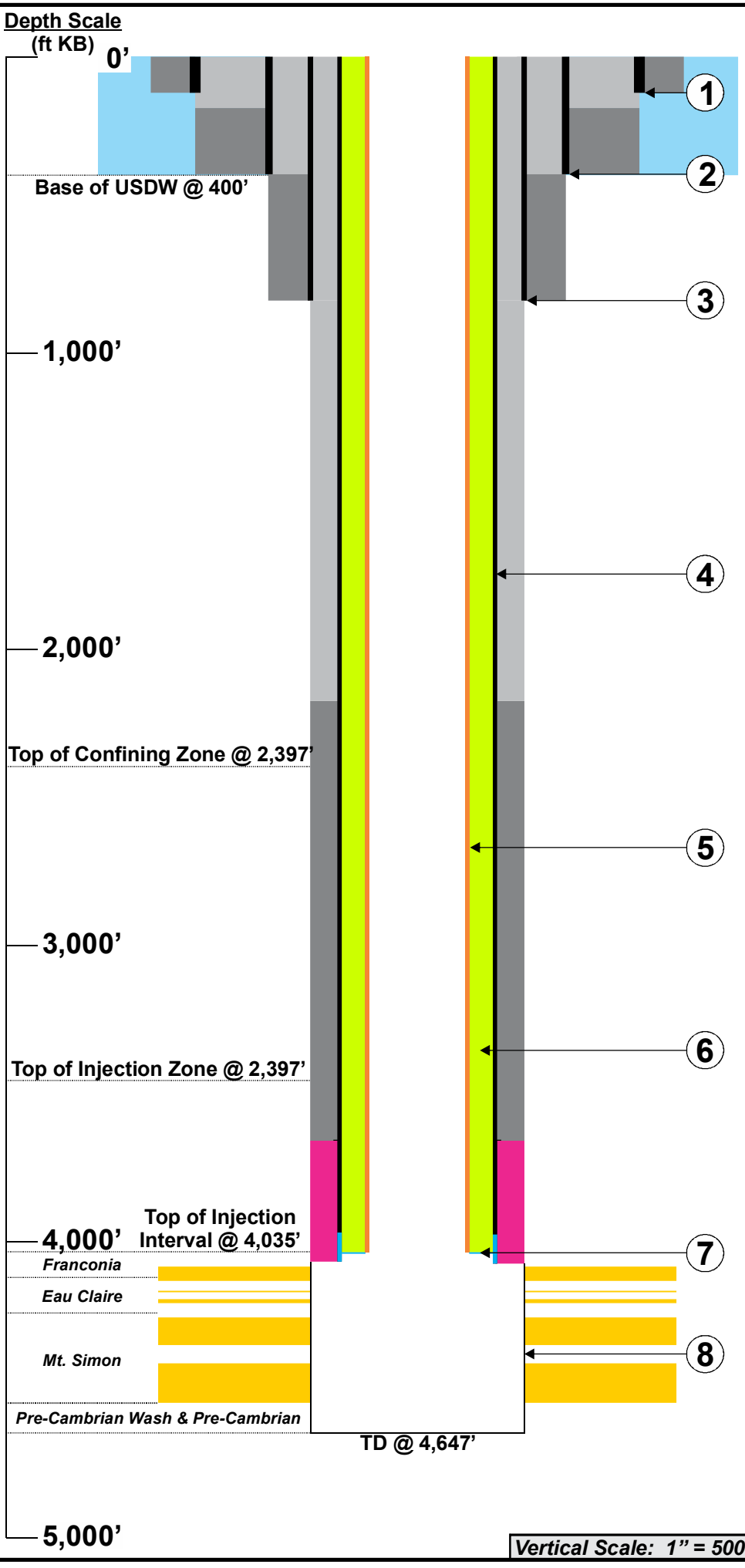
FIGURE 1

REPUBLIC INDUSTRIAL AND ENERGY SOLUTIONS, LLC

ROMULUS, MICHIGAN

WELLHEAD SKETCH
WELL #1-12

DATE 04/30/20	CHECKED BY	JOB NO. 192128A
DRAWN BY SLK	APPROVED BY	DWG NO.



BELOW GROUND DETAILS

1. Conductor Casing: 20", H-40 set in a 24" borehole at 119'. Cemented with 200 sacks of Class A cement containing 3% $CaCl_2$ with 75% returns. Top 50' of annulus cemented with 50 sacks of Class A.
2. Surface Casing: 13-3/8", H-40 set in a 17-1/2" borehole at 405'. Cemented with 75 sacks of Lite lead cement with 3% $CaCl_2$ followed by 150 sacks of Class A tail cement with 3% $CaCl_2$. Top of annulus cemented with 175 sacks of Class A cement with 3% $CaCl_2$.
3. Intermediate Casing: 9-5/8", 36 lb/ft set in a 12-1/4" borehole at 824'. Cemented with 150 sacks of Lite lead with 3% $CaCl_2$ followed by 200 sacks of Class A tail with 3% $CaCl_2$. Approximately 10 bbl of cement circulated to the surface.
4. Protection Casing: 7", 26 lb/ft, K-55, LT&C set in an 8-3/4" borehole to 3,977' and 7", 1/4" wall, Hastelloy C-276, STL set in 8-3/4" borehole from 3,977' to 4,075' with 7" float collar and float shoe set from 4,075' to 4,080. Cement diverter tool set in 7" casing from 3,657' to 3,660'.
   Stage I (3,660' to 4,080'):
   686 gallons (16.3 bbl) of EPSEAL epoxy cement.
   Stage II (Surface to 3,660'):
   500 sacks of 50/50 Standard Pozmiz lead cement with 2% gel, 0.4% HALAD 344 and 3% salt followed by 450 sacks of Standard Class A tail cement containing 3% HALAD 322, 0.4% HALAD 344, 8.2% Microbond, and 2.14% salt.
5. Injection Tubing: 4-1/2", Blue Box 2000, fiberglass tubing to top of packer at 4,036' (4.78', 4-1/2" Hastelloy C-276 landing joint top positioned 1-1/2' above ground level with 4' of stretch. Landing Joint base = 16.28' KB:
   a) 3 Pup Joints (3.64' + 1.72' + 3.60' = 8.96'), 4-1/2", Blue Box FRP;
   b) 4-1/2", Blue Box FRP tubing (137 joints x 29.249'/joint = 4,007.08'
   c) Anchor Seal Assembly, 4.75" x 3.75", Hastelloy C-276, 1.64' long set in Model 12 Injection Packer PBR from 4,036.32' to 4,037.96'.
6. Annulus Fluid: 68.5 bbl (2,877 gallons) of 10 lb/gal brine water containing a corrosion inhibitor, a bactericide and an oxygen scavenger.
7. Injection Packer: Model 12, Hastelloy C-276 wetted parts set from 4,036.3' to 4,041.4'. Polished test bore = 3.50" at packer base.
8. Open Hole Completion: 8-3/4" borehole from 4,080' to 4,645' (TVD = 4,535' @ 4,645' MD).

Bottom-hole location: 211' south and 754' west of surface location (782.97, South 74° 21' 58.35" West)

WSP USA INC.
8212 Kelwood Ave.
Baton Rouge LA 70806
Tel: (225) 753-2561
Fax: (225) 925-2530

FIGURE 2

REPUBLIC INDUSTRIAL AND ENERGY SOLUTIONS, LLC

ROMULUS, MICHIGAN

WELL #1-12
BELOW GROUND SCHEMATIC

DATE 04/30/20	CHECKED BY		JOB NO. 1921128A
DRAWN BY SLK	APPROVED BY		DWG NO.

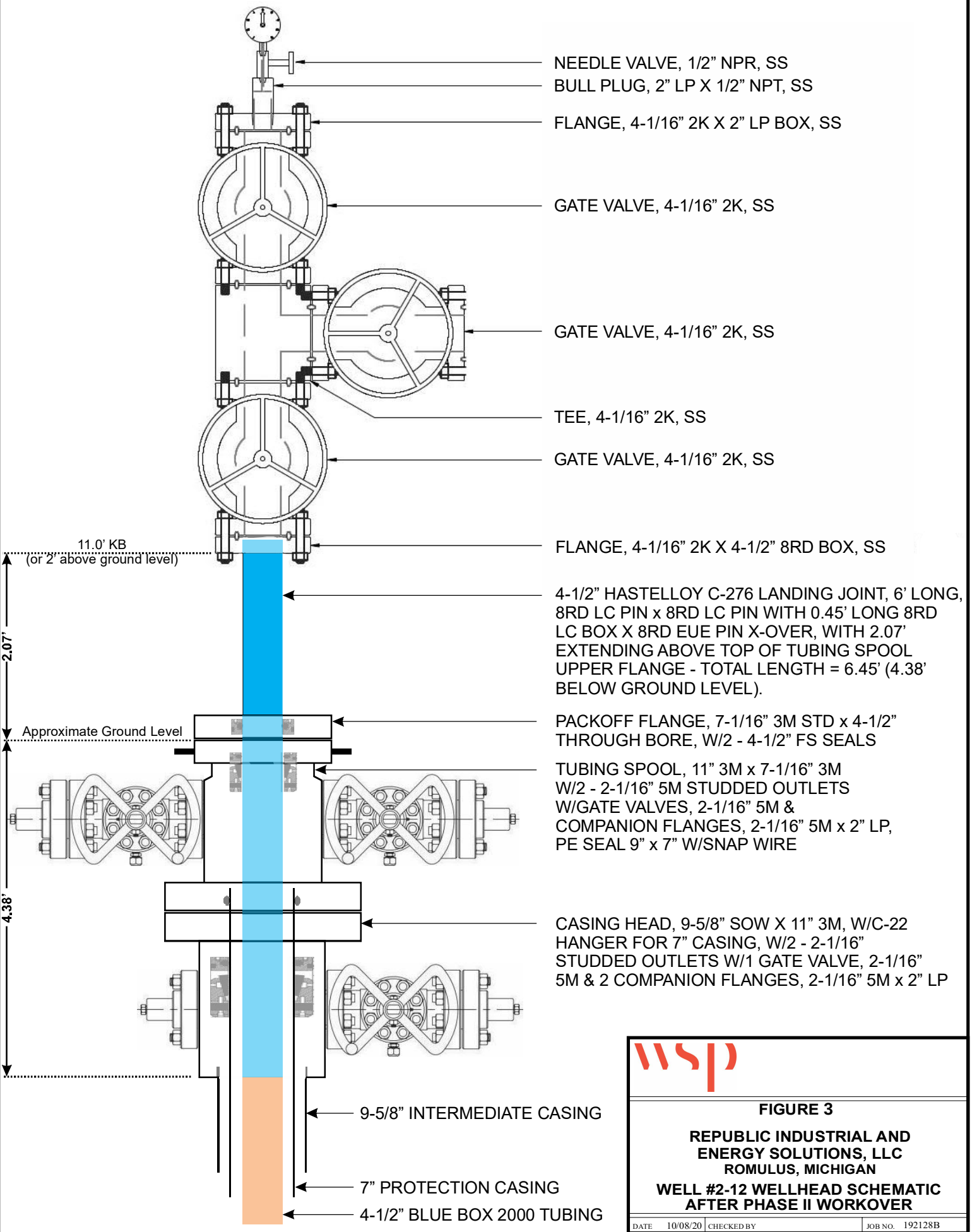
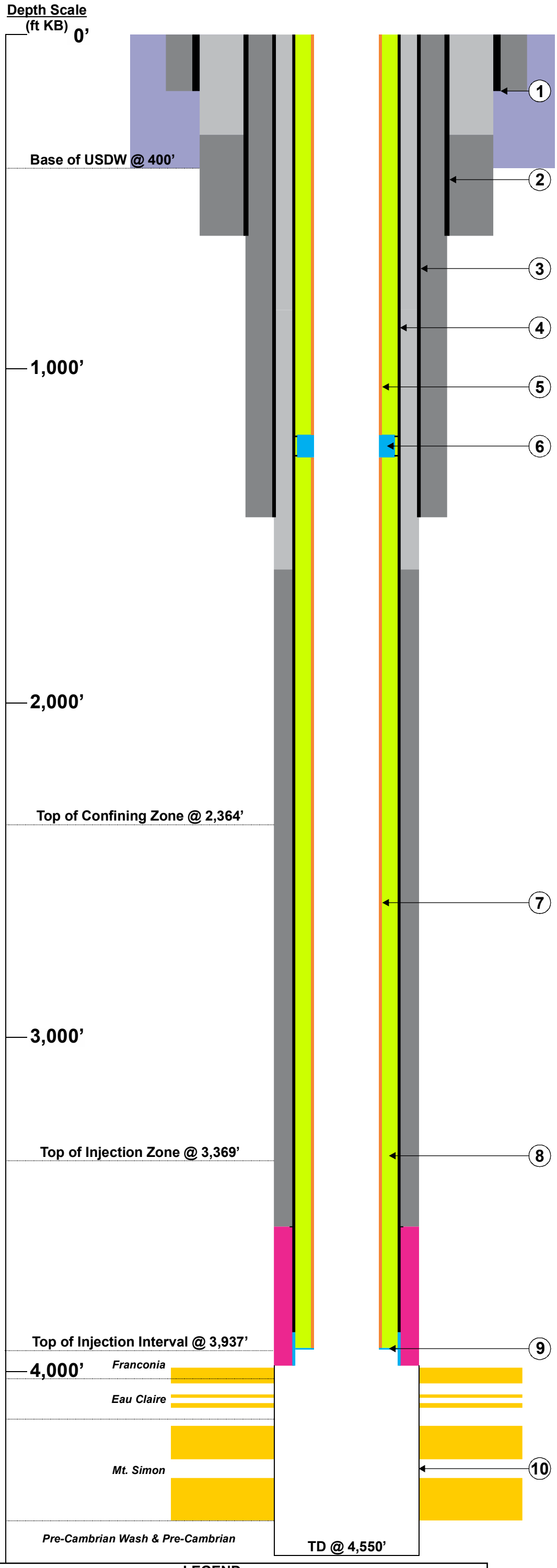


FIGURE 3

REPUBLIC INDUSTRIAL AND ENERGY SOLUTIONS, LLC
ROMULUS, MICHIGAN

WELL #2-12 WELLHEAD SCHEMATIC AFTER PHASE II WORKOVER

DATE 10/08/20	CHECKED BY	JOB NO. 192128B
DRAWN BY SLK	APPROVED BY	DWG NO.



BELOW GROUND DETAILS

1. Conductor Casing: 16”, 60 lb/ft set in a 20” borehole at 169’. Cemented with 300 sacks of Class A cement containing 3% $CaCl_2$ with 75% returns.
2. Surface Casing: 13-3/8”, 48 lb/ft, H-40, ST&C set in a 17-1/2” borehole at 602’. Cemented with 350 sacks of 65/35 Pozalin with 3% $CaCl_2$ followed by 200 sacks of Class A tail cement with 3% $CaCl_2$. Top-out with 50 sacks of Class A cement with 3% $CaCl_2$.
3. Intermediate Casing: 9-5/8”, 36 lb/ft set in a 12-1/4” borehole at 1,444’. Cemented with 725 sacks of Class A with 3% $CaCl_2$. 33 bbl of cement circulated to the surface.
4. Protection Casing: 7”, 26 lb/ft, K-55, LT&C set in an 8-3/4” borehole to 3,882’ and 7”, 1/4” wall, Hastelloy C-276, STL set in 8-3/4” borehole from 3,882’ to 3,979.4’ with 7” float collar and float shoe set from 3,979.4’ to 3,982. Top 10’ of Hastelloy coated with Teflon for galvanic corrosion inhibition. Cement diverter tool set in 7” casing from 3,565.5.’ to 3,568’.
   Stage I (3,568’ to 3,982’):
   686 gallons (16.3 bbl) of 12.5 lb/gal EPSEAL epoxy cement.
   Stage II (Surface to 3,568’):
   310 sacks of 50/50 of Poz followed by 340 sacks of 50/50 Poz with microbond followed by 450 sacks of Standard cement with microbond. 44 bbl circulated to surface.
5. Upper Injection Tubing: 4-1/2”, Blue Box 2000, fiberglass tubing to top of straddle packer at 1,199’:
   a) 6’, 4-1/2” Hastelloy C-276 landing joint top positioned ~2’ above ground level with 1’ of stretch. (Landing Joint base = 15.38’ KB);
   b) 2 Pup Joints (5.71’ + 9.73’), 4-1/2”, Blue Box FRP from 15’ to 31’;
   c) 4-1/2”, Blue Box FRP tubing (40 joints) from 31’ to 1,199’;
   d) Anchor Seal Assembly, 4.75” x 3.75”, Hastelloy C-276, 1.64’ long set in Model 12 Injection Packer PBR from 1,199’ to 1,200.5’.
6. Straddle Packer: Model 12, Hastelloy C-276 wetted parts set from 1,199’ to 1,268’. Upper Element at 1,204’ and Lower Element at 1,265’.
7. Lower Injection Tubing: 4-1/2”, Blue Box 2000, fiberglass tubing set from 1,268’ to 3,930’ with 2’ of stretch as follows:
   a) 4-1/2”, Blue Box FRP tubing (91 joints) from 1,268’ to 3,930’.
   b) Anchor Seal Assembly, 4.75” x 3.75”, Hastelloy C-276, 1.64’ long set in Model 12 Injection Packer PBR from 3,930.0’ to 3,931.5’.
8. Annulus Fluid: 66 bbl (2,772 gallons) of 9.7 lb/gal brine water containing a corrosion inhibitor, a bactericide and an oxygen scavenger.
9. Injection Packer: Model 12, Hastelloy C-276 wetted parts set from 3,930’ to 3,935’.
10. Open Hole Completion: 8-3/4” borehole from 3,975’ to 4,550’.

LEGEND

- USDW
- Receptive Interval
- Annulus Fluid
- Fiberglass
- Carbon Steel
- Hastelloy C-276
- Standard Cement
- Lightweight Cement
- Epoxy Cement

Vertical Scale: 1” = 300’

WSP USA INC.
8212 Kelwood Ave.
Baton Rouge LA 70806
Tel: (225) 753-2561
Fax: (225) 925-2530

FIGURE 4

REPUBLIC INDUSTRIAL AND ENERGY SOLUTIONS, LLC

ROMULUS, MICHIGAN

WELL #2-12 BELOW GROUND DETAILS AFTER PHASE II WORKOVER

DATE 10/08/20	CHECKED BY	JOB NO. 192128B
DRAWN BY SLK	APPROVED BY	DWG NO.

APPENDIX B

CHRONOLOGY OF FIELD ACTIVITIES

16200 Park Row., Suite 200
Houston, Texas 77084
(281) 589-5900

FIELD ACTIVITY REPORT

Company:	**Republic Industrial and Energy Solutions**	Project No:	**192128.0156**
Well:	**EDS 1-12 and EDS 2-12**	Date:	**8/6/2024**
City	**Romulus**	FAR Report No.:	**1**
County/Parrish:	**Wayne County**	WSP Rep.:	**Jeffry Tahtouh**
State:	**MI**		
Work Performed:	__ New Well __Workover _X_ Wireline Consulting __ Other		

Breakdown of Operations

From	To	Hrs	
6:30	6:45	0.25	Arrive on location, held safety meeting, discussed job, and got the notice to proceed
6:45	8:00	1.25	Rig-up Wireline unit on Well 2-12 for Radioactive Tracer Tool (RAT) AP = 600 psi IP = 11 psi Rate= 0 gpm
8:00	8:45	0.75	Run in hole with RAT
8:45			Tagged TD @ 4267' NOTE: Tagged 29' higher compared to last year due to fill
8:00	9:30		JoAnne Mitock with Environmental Solutions AQ (USEPA Region 5 contractor) arrived on site and witnessed the annulus pressure testing on 1-12 and 2-12
8:15	9:15		Ran APT on 1-12. Start Pressure: 1097.8 psig End Pressure: 1085.8 psig Good Test!
8:15	9:15		Ran APT on 2-12. Start Pressure: 1102 psig End Pressure: 1091 psig Good Test!
8:45	12:30	3.75	**Perform Radioactive Tracer Survey on Well 2-12**
8:52	9:18		Run Pre base log (4267'- 3000'). Rate= 0 gpm, AP= 1094 psi IP= 11 psi.
9:26	9:39		Run 5 min stat checks at 3800' and 3855'
9:39	10:30		Waited on APT tests to finish prior to injecting.
10:30	11:15		Initiate Injection at 43 gpm Run chase-down sequence 4 sec slug released at 3100', Rate=43 gpm, AP= 722 psi IP= 310 psi. Four passes.
11:15	11:33		Maintain Injection at 43 gpm Run time-drive survey 30 minute time drive, Eject 4 sec slug at 3750', Run downhole to 3960' and start time drive when slug passed 3960' (11:23) Rate=43 gpm, AP= 733 psi IP= 395 psi.
11:33	11:59		Cease Injection
11:59	12:25		Run Post base log (4267'- 3000'). Rate= 0 gpm, AP= 660 psi IP= 200 psi.
12:30	13:30	1.00	Pull out of the hole. Rig down. **Move to Well 1-12**
13:30	14:00	0.50	Rig-up Wireline unit on Well 1-12 for Radioactive Tracer Tool (RAT) AP = 600 psi IP = 0 psi Rate= 0 gpm
14:00	14:30	0.50	Run in hole with RAT
14:30			Tagged TD @ 4460' NOTE: Tagged 26' higher compared to last year due to fill
14:30	17:45	3.25	**Perform Radioactive Tracer Survey on Well 1-12**
14:36	15:00		Run Pre base log (4460'- 3000'). Rate= 0 gpm, AP= 600 psi IP= 0 psi.
15:08	15:20		Run 5 min stat checks at 3802' and 3955'
15:20	16:31		Initiate Injection at 44 gpm Run chase-down sequence 4 sec slug released at 3100', Rate=44 gpm, AP= 716 psi IP= 375 psi. Four passes.
16:31	17:06		Maintain Injection at 44 gpm Run time-drive survey 30 minute time drive, Eject 4 sec slug at 3750', Run downhole to 4050' and start time drive when slug passed 4050' (16:36) Rate=44 gpm, AP= 725 psi IP= 375 psi.
17:06	17:15		Cease Injection
17:15	17:40		Run Post base log (4460'- 3000'). Rate= 0 gpm, AP= 638 psi IP= 181 psi.
17:45	19:00	1.25	Pull out of the hole. Rig down and move out Michigan Wireline.
			Perform Pressure Build-up for the PFO on Well 2-12
16:15	16:30		Impact's slickline arrived on location, held safety meeting, discussed job, and got the notice to proceed.
16:30	17:00		Rig up with Impact's slickline unit on Well 2-12
17:00	17:30		Ran Slickline unit with bottom hole pressure/temperature gauges downhole at Well 2-12 AP = 623 psi IP = 148 psi Rate= 0 gpm
17:30	18:30		Set gauges @ 3962' GL (3975' KB), let stabilize prior to injection
18:30			Initiate Injection. Well 2-12 pressure buildup phase at a constant rate of 43 gpm
18:30	19:00		Secure wells and leave location
19:00			AP = 719 psi IP = 403 psi Rate= 44 gpm
Total		**12.50**	

Safety Topics

Working in Republic Romulus facility, working at heights, pinch points, radioactive material, heavy lifting

16200 Park Row., Suite 200
Houston, Texas 77084
(281) 589-5900

FIELD ACTIVITY REPORT

Company:	**Republic Industrial and Energy Solutions**	Project No:	**192128.0156**
Well:	**EDS 1-12 and EDS 2-12**	Date:	**8/7/2024**
City	**Romulus**	FAR Report No.:	**2**
County/Parrish:	**Wayne County**	WSP Rep.:	**Jeffry Tahtouh**
State:	**MI**		
Work Performed:	__ New Well __Workover _X_ Wireline Consulting __ Other		

Breakdown of Operations

From	To	Hrs	
6:25			Prior to shut-in @ 6:24 AP = 759 psi IP = 437 psi Rate= 43 gpm Well 2-12 pressure falloff phase Shut-in well and close wing valve @ 6:25 AP = 640 psi IP = 180 psi Rate= 0 gpm
11:00	11:30	0.50	Arrived on site, discussed with J. Frost the next steps for the job. Data Reading at 11:35 AP = 624 psi IP = 160 psi Rate= 0 gpm
Total		**0.50**	

Safety Topics

Working in Republic Romulus facility, working at heights, pinch points, chemical exposure, heavy lifting

16200 Park Row., Suite 200
Houston, Texas 77084
(281) 589-5900

FIELD ACTIVITY REPORT

Company:	**Republic Industrial and Energy Solutions**	Project No:	**192128.0156**
Well:	**EDS 1-12 and EDS 2-12**	Date:	**8/8/2024**
City	**Romulus**	FAR Report No.:	**3**
County/Parrish:	**Wayne County**	WSP Rep.:	**Jeffry Tahtouh**
State:	**MI**		
Work Performed:	__ New Well __Workover _X_ Wireline Consulting __ Other		

Breakdown of Operations

From	To	Hrs	
6:30	6:45	0.25	Arrive on location, held JSA, and obtained permit
6:45			End PFO Test @ 6:40 for **Well 2-12** IP = 145 psi AP = 601 psi Rate = 0 GPM
6:45	7:15	0.50	Run Static Gradient Survey
6:46	6:51		5-min Stop @ 3000'
6:55	7:00		5-min Stop @ 2000'
7:04	7:09		5-min Stop @ 1000'
7:13	7:18		5-min gradient stop @ Surface
7:15	7:45	0.50	Rig down from **Well 2-12.** Download data from the bottom hole pressure gauges. Move to 1-12 to run gauges downhole for pressure falloff.
7:45	8:45	1.00	Rig up on **Well 1-12** Ran Slickline unit with bottom hole pressure/temperature gauges downhole at Well 1-12 Rate= 0 gpm AP = 587 psi IP = 133 psi
8:45	9:15	0.50	Set gauges @ 4067' GL (4080' KB), let stabilize prior to injection
9:15	20:15	11.00	Well 1-12 pressure buildup phase at a constant rate of 43 gpm
9:10			Initiate Injection on **Well 1-12** for the pressure buildup Rate= 40 gpm, AP= 652 psi IP= 279 psi
9:30			Rate= 43 gpm, AP= 683 psi IP= 361 psi
20:17	20:18		Prior to shut-in @ 20:17 AP = 741 psi IP = 392 psi Rate= 43 gpm Well 1-12 pressure falloff phase Shut-in well and close wing valve @ 20:18 Total Volume Injected = 28,566 gal
20:15	20:30	0.25	18:25 AP = 646 psi IP = 173 psi Rate= 0 gpm Secure well and leave location
Total		**14.00**	

Safety Topics

Working in Republic Romulus facility, ppe, pinch points, and fall protection

16200 Park Row., Suite 200
Houston, Texas 77084
(281) 589-5900

FIELD ACTIVITY REPORT

Company:	**Republic Industrial and Energy Solutions**	Project No:	**192128.0156**
Well:	**EDS 1-12 and EDS 2-12**	Date:	**8/9/2024**
City	**Romulus**	FAR Report No.:	**4**
County/Parrish:	**Wayne County**	WSP Rep.:	**Jeffry Tahtouh**
State:	**MI**		
Work Performed:	__ New Well __Workover _X_ Wireline Consulting __ Other		

Breakdown of Operations

From	To	Hrs	
15:45	16:00	0.25	Arrive on location, held JSA, and got the notice to proceed
16:00	17:00	1.00	End PFO Test @ 16:00 for **Well 1-12** IP = 139 psi AP = 585 psi Rate = 0 GPM Run Static Gradient Survey
16:12	16:17		5-min Stop @ 4000'
16:22	16:27		5-min Stop @ 3000'
16:30	16:35		5-min Stop @ 2000'
16:39	16:44		5-min Stop @ 1000'
16:48	16:53		5-min gradient stop @ Surface (in lubricator)
17:00	17:30	0.50	Rig down from **Well 1-12.** Download data from the bottom hole pressure gauges.
8:30			Secure well and leave location
Total		**1.75**	

Safety Topics

Working in Republic Romulus facility, ppe, pinch points, and fall protection

APPENDIX C

ANNULUS PRESSURE TEST DATA

APPENDIX C
WELL 1-12 ANNULUS PRESSURE DATA
August 6, 2024

Time	Time (min)	Pressure (psig)	
08:15:00	0.00	1097.97	START
08:15:30	0.50	1098.11	
08:16:00	1.00	1097.69	
08:16:30	1.50	1097.54	
08:17:00	2.00	1096.98	
08:17:30	2.50	1096.55	
08:18:00	3.00	1096.27	
08:18:30	3.50	1096.41	
08:19:00	4.00	1095.85	
08:19:30	4.50	1095.99	
08:20:00	5.00	1095.28	
08:20:30	5.50	1095.57	
08:21:00	6.00	1095.28	
08:21:30	6.50	1095.28	
08:22:00	7.00	1094.86	
08:22:30	7.50	1094.43	
08:23:00	8.00	1094.43	
08:23:30	8.50	1094.15	
08:24:00	9.00	1094.15	
08:24:30	9.50	1094.01	
08:25:00	10.00	1093.87	
08:25:30	10.50	1094.01	
08:26:00	11.00	1093.87	
08:26:30	11.50	1093.02	
08:27:00	12.00	1093.30	
08:27:30	12.50	1093.16	
08:28:00	13.00	1092.88	
08:28:30	13.50	1092.60	
08:29:00	14.00	1092.88	
08:29:30	14.50	1092.74	
08:30:00	15.00	1092.17	
08:30:30	15.50	1092.46	

Time	Time (min)	Pressure (psig)	
08:31:00	16.00	1092.60	
08:31:30	16.50	1092.31	
08:32:00	17.00	1091.75	
08:32:30	17.50	1091.75	
08:33:00	18.00	1091.47	
08:33:30	18.50	1091.61	
08:34:00	19.00	1091.47	
08:34:30	19.50	1091.61	
08:35:00	20.00	1091.18	
08:35:30	20.50	1091.47	
08:36:00	21.00	1091.61	
08:36:30	21.50	1090.76	
08:37:00	22.00	1091.18	
08:37:30	22.50	1090.90	
08:38:00	23.00	1090.62	
08:38:30	23.50	1091.04	
08:39:00	24.00	1090.62	
08:39:30	24.50	1090.48	
08:40:00	25.00	1090.19	
08:40:30	25.50	1090.62	
08:41:00	26.00	1090.34	
08:41:30	26.50	1090.34	
08:42:00	27.00	1089.82	
08:42:30	27.50	1090.19	
08:43:00	28.00	1090.05	
08:43:30	28.50	1089.91	
08:44:00	29.00	1089.91	
08:44:30	29.50	1089.35	
08:45:00	30.00	1089.77	
08:45:30	30.50	1089.21	
08:46:00	31.00	1089.49	
08:46:30	31.50	1089.06	

APPENDIX C, Continued
WELL 1-12 ANNULUS PRESSURE DATA
August 6, 2024

Time	Time (min)	Pressure (psig)	
08:47:00	32.00	1089.35	
08:47:30	32.50	1089.35	
08:48:00	33.00	1088.92	
08:48:30	33.50	1089.35	
08:49:00	34.00	1088.92	
08:49:30	34.50	1088.92	
08:50:00	35.00	1088.92	
08:50:30	35.50	1088.50	
08:51:00	36.00	1088.64	
08:51:30	36.50	1088.36	
08:52:00	37.00	1088.78	
08:52:30	37.50	1088.07	
08:53:00	38.00	1088.64	
08:53:30	38.50	1088.08	
08:54:00	39.00	1088.22	
08:54:30	39.50	1088.22	
08:55:00	40.00	1088.21	
08:55:30	40.50	1087.79	
08:56:00	41.00	1088.07	
08:56:30	41.50	1088.07	
08:57:00	42.00	1087.93	
08:57:30	42.50	1087.93	
08:58:00	43.00	1087.51	
08:58:30	43.50	1087.37	
08:59:00	44.00	1087.51	
08:59:30	44.50	1087.51	
09:00:00	45.00	1087.23	
09:00:30	45.50	1087.63	
09:01:00	46.00	1087.23	

Time	Time (min)	Pressure (psig)	
09:01:30	46.50	1087.37	
09:02:00	47.00	1087.23	
09:02:30	47.50	1087.23	
09:03:00	48.00	1087.37	
09:03:30	48.50	1087.37	
09:04:00	49.00	1087.23	
09:04:30	49.50	1087.09	
09:05:00	50.00	1086.94	
09:05:30	50.50	1086.58	
09:06:00	51.00	1086.80	
09:06:30	51.50	1086.42	
09:07:00	52.00	1086.52	
09:07:30	52.50	1086.94	
09:08:00	53.00	1086.10	
09:08:30	53.50	1086.38	
09:09:00	54.00	1086.38	
09:09:30	54.50	1085.95	
09:10:00	55.00	1086.52	
09:10:30	55.50	1086.24	
09:11:00	56.00	1086.38	
09:11:30	56.50	1086.38	
09:12:00	57.00	1086.24	
09:12:30	57.50	1086.10	
09:13:00	58.00	1086.10	
09:13:30	58.50	1085.67	
09:14:00	59.00	1085.49	
09:14:30	59.50	1085.53	
09:15:00	60.00	1085.67	END

APPENDIX D

CALIBRATION CERTIFICATES

August 6, 2024

John Frost
Republic Services

Re: Testing Performed at Republic Services
Job No. REPS248117-1

Dear John:

Please find enclosed (9) nine calibration forms for the COMPANY location dated July 29th, 2024. If you have any questions, please feel free to call our office at 734-424-1200.

Sincerely,

Brian Davis

Brian Davis
Project Manager

BD/sc

Team UIS
2290 Bishop Circle East
Dexter, MI 48130
Phone: (734) 424-1200 - Fax: (734) 424-0031
teamuis.com

Table of Contents
Job #REPS248117-1

Customer Republic Services
User Republic Services
Plant 28470 Citrin Drive

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 1 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**1 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 77 °F Humidity: 87 %RH

Equip Location: Plant Sub/Parent: Well 1 Position/Child: Annulus Pressure Primary

NAMEPLATE

Item Tested	Pressure Transmitter Primary		
Manufacturer	Yokogawa	Model Number	EJA530E
Serial Number	91V719511	Tag Number	?
Operating Range	0-7200 PSI	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

As Found - Within Spec As Left - Within Spec

INPUT psig OUTPUT psig/mA

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1	0	0	1/4.01	☐	0/4.00	☐	-2	2
2	4.9	350	350/4.78	☐	350/4.78	☐	348	352
3	9.7	700	701/5.55	☐	700/5.55	☐	698	602
4	14.6	1050	1049/6.33	☐	1049/6.33	☐	1048	1052
5	19.4	1400	1400/7.11	☐	1400/7.11	☐	1398	1402
6				☐		☐		

Communicator: Hart-OEM Specific **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025
2	Fluke	754	KM-753	6/14/2024	6/30/2025
3	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026
4	Fluke	754	JB-1479	9/26/2023	9/30/2024

Comments:
Verified computer display.
switched with datalogger due to transmitter dropping out during operation serial 5613698

Deficiencies:
NOTE: when Primary transmitter disconnected - computer display went to zero

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 2 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**2 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 77 °F Humidity: 87 %RH

Equip Location: Plant Sub/Parent: Well 1 Position/Child: Annulus Pressure SEC

NAMEPLATE

Item Tested	Pressure Transmitter Secondary		
Manufacturer	Yokogawa	Model Number	EJA530E
Serial Number	91V926594	Tag Number	PIT3838
Operating Range	cal 0-1400 psig HART	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

As Found - Within Spec As Left - Within Spec

INPUT psig OUTPUT psig/mA

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1	0	0	0/4.00	☐	0/4.00	☐	-2	2
2	4.9	350	350/4.78	☐	350/4.78	☐	348	352
3	9.7	700	701/5.56	☐	701/5.56	☐	698	602
4	14.6	1050	1051/6.34	☐	1051/6.34	☐	1048	1052
5	19.4	1400	1400/7.11	☐	1400/7.11	☐	1398	1402
6		Hart Address	1	☐	1	☐		
7				☐		☐		

Communicator: Hart-OEM Specific **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025
2	Fluke	754	KM-753	6/14/2024	6/30/2025
3	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026
4	Fluke	754	JB-1479	9/26/2023	9/30/2024

Comments:
Hart Address 1
switched with datalogger due to transmitter dropping out during operation serial 5613698

Deficiencies:

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 3 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**3 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 80 °F Humidity: 87 %RH

Equip Location: Plant Sub/Parent: Well 1 Position/Child: Well 1 Flow

NAMEPLATE

Item Tested	Clamp-on Flowmeter		
Manufacturer	Keyence	Model Number	FD-R80
Serial Number	#G38220528	Tag Number	NA
Operating Range	0-400 GPM	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

		INPUT Diag	OUTPUT Diag			
Line	%	Applied	As Found	OOT	As Left	OOT
1	test	0	3	☐	0	☐
2	test	57	61	☐	57	☐
3	Test	0	0	☐	0	☐
4	8/1/1/24	51	54	☐	54	☐
5				☐		☐

Communicator: **Totalizer As Found** NA **Totalizer As Left** 19757592 Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Grey Line	TTFM	SHOP-2573	8/25/2023	8/31/2026
2	Grey Line	TTFM	SHOP-2518	5/18/2023	5/31/2026
3	Extech	RH300(Ambient)	RC-1773	1/11/2021	1/11/2026
4	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026

Comments:

Deficiencies:

Date of Issue: 8/6/2024 **Tech 1:** **K. Mitchell** **Tech 2:** **R. Coon** ISO-81523D-ISO Cert 2015; Rev Oct 2022

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 4 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**4 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 84 °F Humidity: 72 %RH

Equip Location: Plant Sub/Parent: Well 1 Position/Child: Well Pressure Primary

NAMEPLATE

Item Tested	Pressure Transmitter Primary		
Manufacturer	Yokogawa	Model Number	EJA530E
Serial Number	91V926590-938	Tag Number	PIT3938
Operating Range	cal 0-1000 psig (Meter Span 0-7200 psi)	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

As Found - Within Spec As Left - Within Spec

INPUT psig OUTPUT mA/ PSIG

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1	0	0	4.00	☐	4.00	☐	-2	2
2	3.5	250	4.56	☐	4.56	☐	248	252
3	6.9	500	5.11	☐	5.11	☐	498	502
4	10.4	750	5.67	☐	5.67	☐	748	752
5	13.9	1000	6.22	☐	6.22	☐	998	1002
6				☐		☐		

Communicator: HART **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Fluke	754	JB-1479	9/26/2023	9/30/2024
2	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025
3	Fluke	754	KM-753	6/14/2024	6/30/2025
4	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026

Comments:
Verified to computer display

Deficiencies:

Date of Issue: 8/6/2024 **Tech 1:** **J. Busha** **Tech 2:** **NA** ISO-81523D-ISO Cert 2015; Rev Oct 2022

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 5 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**5 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 83 °F Humidity: 51 %RH

Equip Location: Plant Sub/Parent: Well 1 Position/Child: Well Pressure Secondary

NAMEPLATE

Item Tested	Pressure Transmitter Secondary to Logger (Cloud)		
Manufacturer	Yokogawa	Model Number	EJA53
Serial Number	91V926616-932	Tag Number	PIT3938
Operating Range	cal 0-1000 psig	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

INPUT psig OUTPUT psig

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1		0	see Deficiencies	☐	0	☐	-2	2
2		250	see Deficiencies	☐	250	☐	248	252
3		500	see Deficiencies	☐	500	☐	498	502
4		750	see Deficiencies	☐	750	☐	748	752
5		1000	see Deficiencies	☐	1000	☐	998	1002
6				☐		☐		

Communicator: HART **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025
2	Fluke	754	SHOP-1273	5/7/2024	5/31/2025
3	Extech	RH300(Ambient)	RC-1773	1/11/2021	1/11/2026

Comments:
Unit had no power and unit would also not power up. Customer gave me used spare. Unitdid calibrate but adjustment screw on side of unit is frozen. Cal was done with 754 as well as programming. Did not know HART address but tried 3 and it was it. Tested to the cloud with Brandon in Texas. No one here had access to the cloud. RC2024

Deficiencies:
No loop power to transmitter

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 6 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**6 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 83 °F Humidity: 51 %RH

Equip Location: Plant Sub/Parent: Well 2 Position/Child: Annulus Pressure Primary

NAMEPLATE

Item Tested	Pressure Transmitter Primary		
Manufacturer	Yokogaw	Model Number	EJA530E-JDS7N-012EL/FU1/D1/JH05
Serial Number	91V927606	Tag Number	PIT3938
Operating Range	cal 0-1000 psig	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

As Found - Within Spec As Left - Within Spec

INPUT psig OUTPUT psi/mA

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1		0	1/3.99	☐	3.99	☐	-2	+2
2		250	249/4.55	☐	4.55	☐	248	252
3		500	5.10	☐	5.10	☐	498	502
4		750	5.66	☐	5.66	☐	748	752
5		1000	6.22	☐	6.22	☐	998	1002
6		Hart Address	4	☐	4	☐		
7				☐		☐		

Communicator: Hart-OEM Specific **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026
2	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025

Comments:
no mA output; unit comm with Hart to PLC

Deficiencies:

Date of Issue: 8/6/2024 **Tech 1:** **J. Busha** **Tech 2:** **NA** ISO-81523D-ISO Cert 2015; Rev Oct 2022

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 7 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**7 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 80 °F Humidity: 55 %RH

Equip Location: Plant Sub/Parent: Well 2 Position/Child: Well 2 Flow

NAMEPLATE

Item Tested	Clamp-on Flowmeter		
Manufacturer	Keyence	Model Number	FD-R80
Serial Number	G3822052?	Tag Number	FIT3832
Operating Range	0-400 GPM	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

INPUT GPM OUTPUT GPM

Line	%	Applied	As Found	OOT	As Left	OOT
1	test	0	0	☐	0	☐
2	test	69-72	71-73	☐	71-73	☐
3				☐		☐

Communicator: **Totalizer As Found** NA **Totalizer As Left** 2296201 Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Grey Line	TTFM	SHOP-2518	5/18/2023	5/31/2026
2	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026

Comments:

Deficiencies:

Date of Issue: 8/6/2024 **Tech 1:** **K. Mitchell** **Tech 2:** **NA** ISO-81523D-ISO Cert 2015; Rev Oct 2022

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER **Republic Services** CERTIFICATE # **REPS248117-1, 8 of 9**

ADDRESS **28470 Citrin Drive; Romulus MI US 48174** JOB # **REPS248117-1**

USER **Republic Services; 28470 Citrin Drive; Romulus MI US 48174** PAGE **8 of 9**

OWNER REPRESENTATIVE **John Frost** TELEPHONE **734-946-1000**

Service Date: 7/29/2024 Temp: 83 °F Humidity: 52 %RH

Equip Location: Plant Sub/Parent: Well 2 Position/Child: Well 2 Pressure Primary

NAMEPLATE

Item Tested	Pressure Transmitter Primary		
Manufacturer	Yokogaw	Model Number	EJA530E-JDS7N-012EL/FU1/D1/JH05
Serial Number	91W312670	Tag Number	PIT3935
Operating Range	0-7200 PSI	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

INPUT psig OUTPUT mA

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1	0	0	1/3.99	☐	0/4.00	☐	-2	+2
2	3.5	250	248/4.55	☐	250/4.55	☐	248	252
3	6.9	500	498/5.10	☐	500/5.11	☐	498	502
4	10.4	750	748/5.65	☐	750/5.66	☐	748	752
5	13.9	1000	998/6.21	☐	1000/6.22	☐	998	1002
6		Hart Address	5	☐	5	☐		
7				☐		☐		

Communicator: **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025
2	Fluke	754	KM-753	6/14/2024	6/30/2025
3	Fluke	754	JB-1479	9/26/2023	9/30/2024
4	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026

Comments:

Deficiencies:
mA found in tolerance. Display is not correct but doesn't impact anything to their SCADA.

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-1, 9 of 9**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-1**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**9 of 9**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 84 °F Humidity: 79 %RH

Equip Location: Plant Sub/Parent: Well 2 Position/Child: Well 2 Pressure Secondary

NAMEPLATE

Item Tested	Pressure Transmitter Secondary (to recorder)		
Manufacturer	Yokogawa	Model Number	EJA530E-JDS7N-012EL/FU1/D1/JH05
Serial Number	91W405865	Tag Number	PIT
Operating Range	0-7200 PSI	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

As Found - Within Spec As Left - Within Spec

INPUT psig OUTPUT psig

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1	0	0	2	☐	0	☐	-2	+2
2	3.5	250	248	☐	250	☐	248	252
3	6.9	500	498	☐	500	☐	498	502
4	10.4	750	748	☐	750	☐	748	752
5	13.9	1000	998	☐	1000	☐	998	1002
6		Hart Address	1	☐	1	☐		
7				☐		☐		

Communicator: Hart-OEM Specific **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025
2	Fluke	754	KM-753	6/14/2024	6/30/2025
3	Fluke	754	JB-1479	9/26/2023	9/30/2024
4	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026

Comments:
no mA output; unit comm with Hart to PLC

Deficiencies:

Date of Issue: 8/6/2024 **Tech 1:** **J. Busha** **Tech 2:** **NA** ISO-81523D-ISO Cert 2015; Rev Oct 2022

Comment Summary
Job #REPS248117-1

Customer Republic Services
User Republic Services

Plant: 28470 Citrin Drive
Substation: Well 1
Position: Annulus Pressure Primary
Equipment: ISO-81235D1-ISO CERT 2015
Page: 1
Date: 7/29/2024

Comments: Verified computer display.
switched with datalogger due to transmitter dropping out during operation serial 5613698

Plant: 28470 Citrin Drive
Substation: Well 1
Position: Annulus Pressure SEC
Equipment: ISO-81235D1-ISO CERT 2015
Page: 2
Date: 7/29/2024

Comments: Hart Address 1
switched with datalogger due to transmitter dropping out during operation serial 5613698

Plant: 28470 Citrin Drive
Substation: Well 1
Position: Well Pressure Primary
Equipment: ISO-81235D1-ISO CERT 2015
Page: 4
Date: 7/29/2024

Comments: Verified to computer display

Plant: 28470 Citrin Drive
Substation: Well 2
Position: Annulus Pressure Primary
Equipment: ISO-81235D1-ISO CERT 2015 (4)
Page: 6
Date: 7/29/2024

Comments: no mA output; unit comm with Hart to PLC

Plant: 28470 Citrin Drive
Substation: Well 2
Position: Well 2 Pressure Secondary
Equipment: ISO-81235D1-ISO CERT 2015 (6)
Page: 9
Date: 7/29/2024

Comments: no mA output; unit comm with Hart to PLC

Deficiency Summary
Job #REPS248117-1

Customer Republic Services

User Republic Services

Plant: 28470 Citrin Drive | Page: 1
Substation: Well 1 | Date: 7/29/2024
Position: Annulus Pressure Primary
Equipment: ISO-81235D1-ISO CERT 2015

Deficiencies: NOTE: when Primary transmitter disconnected - computer display went to zero

Plant: 28470 Citrin Drive | Page: 5
Substation: Well 1 | Date: 7/29/2024
Position: Well Pressure Secondary
Equipment: ISO-81235D1-ISO CERT 2015

Deficiencies: No loop power to transmitter

Plant: 28470 Citrin Drive | Page: 8
Substation: Well 2 | Date: 7/29/2024
Position: Well 2 Pressure Primary
Equipment: ISO-81235D1-ISO CERT 2015 (5)

Deficiencies: mA found in tolerance. Display is not correct but doesn't impact anything to their SCADA.

Signature:

Email: brian.davis@teamuis.com

REPS248117-1

Final Audit Report 2024-08-07

Created:	2024-08-06
By:	Sally Crane (sally.crane@teamuis.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAPmoQ_vl9SwoFnYGYMIodmQDv4Pd1TKz9

"REPS248117-1" History

Document created by Sally Crane (sally.crane@teamuis.com)
2024-08-06 - 1:15:23 PM GMT

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2024-08-06 - 1:15:29 PM GMT

Email viewed by Brian Davis (brian.davis@teamuis.com)
2024-08-06 - 1:17:48 PM GMT

Document e-signed by Brian Davis (brian.davis@teamuis.com)
Signature Date: 2024-08-07 - 11:01:21 AM GMT - Time Source: server

Agreement completed.
2024-08-07 - 11:01:21 AM GMT

August 8, 2024

Andrew McBride
Republic Services

Re: Calibration Performed at 28470 Citrin Drive
Job No. REPS248117-2

Dear Andrew:

Please find enclosed (1) one calibration form for the 28470 Citrin Drive location dated July 29, 2024. If you have any questions, please feel free to call our office at 734-424-1200.

Sincerely,

Ken Wesley

Ken Wesley (Aug 8, 2024 11:41 EDT)

Ken Wesley
Project Manager

KW/gb

Team UIS
2290 Bishop Circle East
Dexter, MI 48130
Phone: (734) 424-1200 - Fax: (734) 424-0031
teamuis.com

Table of Contents
Job #REPS248117-2

Customer Republic Services
User Republic Services
Plant 28470 Citrin Drive

CALIBRATION CERTIFICATE

UIS SCADA
2290 Bishop Circle E.
Dexter, MI 48130
734-424-1200

CUSTOMER	**Republic Services**	CERTIFICATE #	**REPS248117-2, 1 of 1**
ADDRESS	**28470 Citrin Drive; Romulus MI US 48174**	JOB #	**REPS248117-2**
USER	**Republic Services; 28470 Citrin Drive; Romulus MI US 48174**	PAGE	**1 of 1**
OWNER REPRESENTATIVE	**John Frost**	TELEPHONE	**734-946-1000**

Service Date: 7/29/2024 Temp: 85 °F Humidity: 59 %RH

Equip Location: Plant Sub/Parent: Well 2 Position/Child: Annulus Pressure SEC

NAMEPLATE

Item Tested	Pressure Transmitter		
Manufacturer	Yokogawa	Model Number	EJA530E-JDS7N-012EL/FU1/D1/JH05
Serial Number	91V926611	Tag Number	PIT
Operating Range	cal 0-1000 psig	Procedure/Method	Fluke 754:75x_umeng0000 rev Jul 2011

As Found - Within Spec As Left - Within Spec

INPUT psig OUTPUT psig

Line	%	Applied	As Found	OOT	As Left	OOT	Lo Spec	Hi Spec
1		0	1	☐	1	☐	-2	+2
2		250	250	☐	250	☐	248	252
3		500	500	☐	500	☐	498	502
4		750	750	☐	750	☐	748	752
5		1000	1000	☐	1000	☐	998	1002
6		Hart Address	2	☐	2	☐		
7				☐		☐		

Communicator: Hart-OEM Specific **Totalizer As Found** NA **Totalizer As Left** NA Gal

#	Manufacturer	Model	Serial / ID Number	Calibration Date	Calibration Due
1	Fluke	700RG31 10Kpsi	SHOP-2526	3/12/2024	3/31/2025
2	Extech	RH300(ambient)	KM-1052	6/8/2021	6/30/2026

Comments:
no mA output; unit comm with Hart

Deficiencies:

Date of Issue: 8/8/2024 **Tech 1:** **J. Busha** **Tech 2:** **NA** ISO-81523D-ISO Cert 2015; Rev Oct 2022

Comment Summary
Job #REPS248117-2

Customer Republic Services

User Republic Services

Plant: 28470 Citrin Drive

Substation: Well 2

Position: Annulus Pressure SEC

Equipment: ISO-81235D1-ISO CERT 2015 (5)

Page: 1

Date: 7/29/2024

Comments: no mA output; unit comm with Hart

REPS248117-2

Final Audit Report 2024-08-08

Created:	2024-08-08
By:	Gina Benn (gina.benn@teamuis.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAHPUXNoU8sijB78NY_beEQBCeT1jmZflT

"REPS248117-2" History

Document created by Gina Benn (gina.benn@teamuis.com)
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Document e-signed by Ken Wesley (ken.wesley@teamuis.com)
Signature Date: 2024-08-08 - 3:41:57 PM GMT - Time Source: server

Agreement completed.
2024-08-08 - 3:41:57 PM GMT

Cal-scan Services Ltd.
4188-93 Street
Edmonton, Alberta, Canada
T6E 5P5
Phone: (780) 944-1377 Fax: (780) 944 - 1406

Calibration Certificate

Model :	Badger Low Temp	**Range :**	10,000.00 psi
Serial Number :	91932	**Last Cal. Date :**	04-October-2023

Specifications

Calibration Pressure Range:		0.00	10,000.00	psi
Calibration Temperature Range:		0.00	150.00	°C
Pressure:	Accuracy	±	2.4000 psi (0.024 %FS)	
	Resolution	±	0.0300 psi (0.0003 %FS)	
Temperature:	Accuracy	±	0.40 °C	
	Resolution	±	0.001 °C	

Calibration Summary

Pressure: Accuracy (maximum error)	0.74	psi
Temperature: Accuracy (maximum error)	0.17	°C

Traceability Statement

All working standards are traceable to national or internationally recognized standards.

Calibrated with Cal-Scan DWG # 6

Calibrated by:

Ferris Victoria

Cal-scan Services Ltd.
4188-93 Street
Edmonton, Alberta, Canada
T6E 5P5
Phone: (780) 944-1377 Fax: (780) 944 - 1406

Calibration Certificate

Model :	Badger Low Temp	**Range :**	10,000.00 psi
Serial Number :	91933	**Last Cal. Date :**	04-October-2023

Specifications

Calibration Pressure Range:		0.00	10,000.00	psi
Calibration Temperature Range:		0.00	150.00	°C
Pressure:	Accuracy	±	2.4000 psi (0.024 %FS)	
	Resolution	±	0.0300 psi (0.0003 %FS)	
Temperature:	Accuracy	±	0.40 °C	
	Resolution	±	0.001 °C	

Calibration Summary

Pressure: Accuracy (maximum error)	1.86	psi
Temperature: Accuracy (maximum error)	0.17	°C

Traceability Statement

All working standards are traceable to national or internationally recognized standards.

Calibrated with Cal-Scan DWG # 6

Calibrated by:

Ferris Victoria

APPENDIX E

EPA STANDARD ANNULAR PRESSURE TEST FORM

Mackinnon, James

From: Stilger, Jason (EGLE) <StilgerJ@michigan.gov>
Sent: Friday, September 6, 2024 3:11 PM
To: Mackinnon, James
Cc: Frost, John
Subject: RE: Witnessed Shutdown

Hi James,

I can confirm that I witnessed the shutdown test on August 22, 2024 for the EDS 1-12 well. The details of the test are accurate in the description below and the system did shut down as expected.

Please let me know if you need any additional information..

Thanks,
Jason Stilger
Area Geologist
Geologic Resources Management Division
Michigan Department of Environment, Great Lakes, and Energy
Warren District Office
248-320-8251 | StilgerJ@Michigan.gov
Follow Us | **Michigan.gov/EGLE**

From: Mackinnon, James <JMackinnon@republicservices.com>
Sent: Thursday, September 5, 2024 4:55 PM
To: Stilger, Jason (EGLE) <StilgerJ@michigan.gov>
Cc: Frost, John <JFrost@republicservices.com>
Subject: Witnessed Shutdown

Hi Jason, I apologize for the delay. Can you please confirm this account of the witnessed shutdown that took place last month?

On August 22, 2024 Jason Stilger was on site. Shortly after 10 AM, Well 1 was injecting at about 233 psi. Mr. Stilger witnessed the controlled shutdown takes place; the exceedance levels for the injection pressure were lowered to 200 psi for the high level alarm and 225 psi for the high high level alarm. Because the injection pressure exceeded these levels the injection pump shut off followed by charge pump P9. After shutdown was witnessed, the representative followed with a regular inspection.

James Mackinnon, CHMM
Engineering Leadership Trainee Industrial Wells

e JMackinnon@republicservices.com
o
c 734-406-5712

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF INSPECTION

EPA Regional Office USEPA Region V WU-16J Chicago, IL 60604	Environmental Solutions AQ P.O. Box 6052 Oxford, OH 45056	Firm to be inspected Republic Industrial & Energy Solutions, Inc.
Date 8/6/24 Time 9:50 AM	Notice of inspection is hereby given according to Section 1445 (b) of the Safe Drinking Water Act (42 U.S.C §300f et seg.).	

Reason For Inspection MIT (SAPT) Part I. Well EDS -1-12
Well EDS 2-12

For the purpose of inspecting records, files, papers, processes, controls and facilities, and obtaining samples to determine whether the person subject to an applicable underground injection control program has acted or is acting in compliance with the Safe Drinking Water Act and any applicable permit or rule.

Section 1445 (b) of the SDWA(42 U.S.C §300j-4(b) is quoted on the reverse of this form

Receipt of this Notice of Inspection is hereby acknowledged.

Firm Representative	Date	Inspector
John Foos	8/6/24	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator	Republic Industrial ~ Energy Solutions, Inc	State Permit Number	00452
Address	28470 Citrin Dr.	EPA Permit Number	MI-163-1W-C010
	Romulus, MI 48174	Date of Test	8/6/24
Well Name & Number	Well EDS-1-12	Well Type	1W

Quarter	Quarter	Quarter	Section	Township	Range	Township Name	County	State
SW	NW	SE	12	3S	9E	Georgetown	Wayne	MI

GPS file number	Latitude	Longitude	Elevation
	42.243516	-83.316826	

Company Representative	John Frost	Field Inspector	JoAnne Mistock

GAUGE CERTIFICATION

Type Pressure Gauge Yokogawa } 3 inch face 7000 psi full scale 0.1 psi increments
New Gauge? Yes ☐ No ☑ If no, date of calibration 7/29/24 Calibration certification submitted? Yes ☐ No ☐

TEST RESULTS

Time	8:15	8:25	8:35	8:45	8:55	9:05	9:15
Annulus	1097.8	1093.3	1091.5	1089.7	1088.2	1086.8	1085.8
Tubing psi	4.5 m 171	198	207	218	227	237	244

WELL STATUS

5 Year	☐	TD#_____
2 Year TA	☐	TD#_____
Rework after failure	☐	TD#_____
New Permit	☐	TD#_____
Enforcement Action	☐	TD#_____
Annual Class 1	☑	TD#_____

WELL CONFIGURATION

Casing Size	7"
Tubing Size	4½"
Packer Type	Model 12, Hastelloy
Packer set @	4050

Fluid Return (gal) * NA - pressure tank

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x .03 32.9 psi
Test Pressure change 120 psi

Test Passed ☑ Test Failed ☐ : ***If failed test, well must shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.***

COMMENT:
well shut in 11 PM 8/5/24. * Bled annulus to 610 psi post test, 8.9 gallons returned to pressure tank

Signature of Company Representative	Date
John Frost	8.6.24
Signature of UIC Field Inspector	Date
John Mistock	8/6/24

APPENDIX F

EPA RADIOACTIVE TRACER SURVEY FORM

BACKGROUND INFORMATION FOR REVIEW OF RADIOACTIVE TRACER SURVEYS FOR CEMENT INTEGRITY

Facility Name: Republic Industrial and Energy Solutions, LLC			Operator: Republic Industrial and Energy Solutions, LLC		
Well Name: #1-12			USEPA Permit Numbe: MI-163-1W-C0010	Witness: Jeffry Tahtouh	
State: Michigan	Test Date: August 6,2024		Logging Company: Michigan Wireline	Depth Reference: Kelly Bushing ✔	Ground Level ☐

Well and Operational Information

Long StringCsg Material: K-55, LT&C	Long String Casing OD, ins: 7.0	Casing weight, #/ft: 26	Casing ID, ins.: 6.276	Long String Casing Length, ft: 4075	
Tubing Material: Blue Box 2000	Tubing OD, ins: 4.5	Tubing weight, #/ft: 4	Tubing ID, ins.: 3.98	Tubing Length, ft: 4032	
Tail Pipe Material: N/A	Tail Pipe OD, ins: N/A	Tail Pipe, weight#/ft.: N/A	Tail Pipe ID, ins.: N/A	Tail Pipe Length, ft: N/A	Tail Pipe Depth: N/A
	OpenHole diameter, in: 8.75	TD, ft: 4647	PBTD, ft: 4647	Top of Open Interval, ft: 4080	
Packer Model	Packer Type: Delta-P Model 12	Top of Packer, ft: 4032	Bottom of Packer, ft: 4035		

Geological Information

Lowermost USDW Name: Sylvania	Fms in Confining Zone: Utica Shale and Trenton Limestone	Fms in Injection Zone: Franconia, Eau Claire, Mt. Simon
Base of USDW, ft: 400	Depth to top of Confinement Zone: 2397	Injection Zone Top, ft: 3937

TOOL INFORMATION

Ejector, ft above BDET: 6.13	TDET, ft above BDET: 8.73	MDET, ft above BDET: n/a			

CALIBRATION INFORMATION

Depth BDET, ft: 3802	Depth TDET, ft: 3793.3	BDET CPSPI: 1.21	Lithology (Warm/Cool): Cool	Maximum Reading, LD: 5.1 CPS	Minimum Reading, LD: 0 CPS
Depth BDET, ft: 3955	Depth TDET, ft: 3946.3	BDET CPSPI: 9.47	Lithology (Warm/Cool): Warm	Maximum Reading, LD: 16.8 CPS	Minimum Reading, LD: 3.6 CPS

FIRST SLUG TRACKING SEQUENCE

Flow Rate, gpm: 44 GPM	Velocity in tubing, fps: 1.1	Depth of deflection on 1st pass, ft: 3193.5	Deflection on 1st pass, LD: 469.5 CPS	Deflection/Backgroun: 324 CPS	Passes Through Slug: 4
Slug Split? yes or no: NO	Depth of Split, ft: N/A	Moved up, yes or no: NO	Minimum Slug Depth, ft: 3100	Distance above shoe, ft: 975	Maximum Slug Depth, ft: 4245

FIRST STATIONARY TEST

Depth of BDET, ft: 4050	Depth of TDET, ft: 4041.3	BDET to open interval, ft: 30	Time at station, mins: 35	Injection Rate, gpm: 44	Log Divisions per Minute: 12
Depth at Injection, ft: 3750		BDET above end of tubing or casing, ft: 30	Reached BDET up, LD	Reach UDET up, LD	Velocity Up, ft/min
2nd Setting Depth, ft	Time of reset	Slug already passed BDET?	Reached BDET up, LD	Slug arrival time	
3rd Setting Depth	Time of reset	Slug already passed BDET?	Reached BDET up, LD	Slug arrival time	
4th setting depth, ft	Time of reset	Slug already passed BDET?	Reached BDET up, LD	Slug arrival time	Upper Limit of Movement, ft

REMEMBER

1. Please fill in the above cells.
2. Inject at highest practicable rate during the stationary test to maximize pressure difference that is the driving force for upward movement of fluid (if it occurs), but at low enough velocity during slug tracking so the slug can be followed effectively.
3. Leave the scaling at the same level for all phases. 40 counts per second per inch is usually effective. We need to be able to see evidence of variation due to lithology.
4. Use big slugs. The height of the deflection caused by the slug should be at least 50 times the difference of the high and low levels measured during logging the initial log.
5. If you record times of arrival, that should be the arrival of the leading edge.
6. The purpose is to determine the shallowest depth at which tracer material leaves the well.
7. When slug tracking, logging through the slug while the last part of the slug is leaving the deeper of the tailpipe or casing is the best way to identify a split. If there is a split, always follow the upper portion to determine the limit of its upward movement.
8. When running the stationary test, set the tool with the bottom detector five feet above the end of the deeper of the tail pipe or casing. If the slug reaches it, move it up in steps to find the shallowest extent of movement.
9. The stationary test must be run long enough to be able to detect upward motion of 2 ft/min.
10. Superimpose the traces of the initial and final base logs.
11. Please submit both the merged and unmerged slug chase records.
12. The test report must explain any anomalies in the results.
13. Please submit the digital logging data on a CD.
14. Submit an up-to-date well schematic.

APPENDIX G

RADIOACTIVE TRACER SURVEY LETTER OF INTERPRATION

michigan wireline services
4854 E. RIVER ROAD • P.O. BOX 782 • MT. PLEASANT, MI 48804-0782
(989) 772-5075

08/13/2024
Republic Services
Romulus Storage
Well #1-12

A Base log was run from 4460’ to 3000’ to establish a base gamma ray for the well pre-ejection of RA material. Two statistical 5-minute time drives were also run to establish the tools functionality. These were done at 3802’ and 3955’.

The logging tool was then brought back up to 3100’ and the water was pumped into the hole at 44 GPM. Once the proper depth and rate were established 4 seconds of RA material (Iodine 131) was ejected into the well. The tool was quickly lowered below the moving RA material and logged back up to the original ejection point of 3100’. Several other passes down though the RA material and back up to the last catch were made to establish flow in the proper direction into the injection zone.

Once the RA count dropped to below 50 cps the tool was brought back up to 3750’ and rate was maintained at 44 GPM. 4 seconds of RA material was ejected at 3750’ then the tool was moved to 4050’ and a time drive log was started. Once the RA material passed both detectors a timer was started to establish a 30-minute window to watch for RA material moving up hole past the packer.

Finally, after 30 minutes the tool was returned to the deepest achievable depth of 4460’ and a final base log was run to 3000’ this final pass and the base pass are plotted together to establish that no RA material moved up hole past the packer at any point during testing.

No RA material migration upward from the packer was noted during any of the testing.

Thanks
Brian Wright

APPENDIX H

RAW PRESSURE AND TEMPERATURE DATA (ABRIDGED)

APPENDIX H
Pressure/Time Data Recorded During the Pressure Transient Test

Start Time: 08/08/24 09:00
Location: Romulus, MI
Recorder Serial No: 91933
Calibration Date: OCT 4/23
Pressure Range: 10005.0 psig

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/08/24	09:00:00	1862.873	74.802	08/08/24	10:14:00	2097.972	66.251	08/08/24	11:28:00	2101.410	68.501
08/08/24	09:01:00	1862.858	74.798	08/08/24	10:15:00	2098.063	66.544	08/08/24	11:29:00	2101.468	68.508
08/08/24	09:02:00	1862.850	74.796	08/08/24	10:16:00	2098.136	66.810	08/08/24	11:30:00	2101.492	68.511
08/08/24	09:03:00	1860.406	74.794	08/08/24	10:17:00	2098.204	67.037	08/08/24	11:31:00	2101.544	68.519
08/08/24	09:04:00	1861.878	74.797	08/08/24	10:18:00	2098.289	67.224	08/08/24	11:32:00	2101.596	68.520
08/08/24	09:05:00	1862.127	74.799	08/08/24	10:19:00	2098.343	67.379	08/08/24	11:33:00	2101.654	68.530
08/08/24	09:06:00	1930.811	74.799	08/08/24	10:20:00	2098.410	67.508	08/08/24	11:34:00	2101.666	68.529
08/08/24	09:07:00	1872.404	74.783	08/08/24	10:21:00	2098.504	67.608	08/08/24	11:35:00	2101.713	68.534
08/08/24	09:08:00	1866.633	74.749	08/08/24	10:22:00	2098.551	67.690	08/08/24	11:36:00	2101.755	68.536
08/08/24	09:09:00	1890.238	74.731	08/08/24	10:23:00	2098.609	67.760	08/08/24	11:37:00	2101.782	68.541
08/08/24	09:10:00	2004.682	74.827	08/08/24	10:24:00	2098.672	67.817	08/08/24	11:38:00	2101.833	68.546
08/08/24	09:11:00	2036.723	75.336	08/08/24	10:25:00	2098.735	67.870	08/08/24	11:39:00	2101.894	68.555
08/08/24	09:12:00	2051.081	76.354	08/08/24	10:26:00	2098.773	67.908	08/08/24	11:40:00	2101.908	68.550
08/08/24	09:13:00	2059.476	77.222	08/08/24	10:27:00	2098.829	67.941	08/08/24	11:41:00	2101.937	68.559
08/08/24	09:14:00	2065.450	77.757	08/08/24	10:28:00	2098.928	67.980	08/08/24	11:42:00	2101.989	68.567
08/08/24	09:15:00	2069.722	78.090	08/08/24	10:29:00	2098.984	68.007	08/08/24	11:43:00	2102.015	68.565
08/08/24	09:16:00	2072.959	78.248	08/08/24	10:30:00	2099.022	68.033	08/08/24	11:44:00	2102.063	68.569
08/08/24	09:17:00	2075.519	78.253	08/08/24	10:31:00	2099.066	68.057	08/08/24	11:45:00	2102.118	68.582
08/08/24	09:18:00	2077.555	78.138	08/08/24	10:32:00	2099.174	68.078	08/08/24	11:46:00	2102.168	68.583
08/08/24	09:19:00	2079.197	77.940	08/08/24	10:33:00	2099.273	68.092	08/08/24	11:47:00	2102.210	68.587
08/08/24	09:20:00	2080.737	77.676	08/08/24	10:34:00	2099.321	68.107	08/08/24	11:48:00	2102.231	68.591
08/08/24	09:21:00	2081.933	77.384	08/08/24	10:35:00	2099.405	68.129	08/08/24	11:49:00	2102.286	68.600
08/08/24	09:22:00	2083.032	77.110	08/08/24	10:36:00	2099.494	68.150	08/08/24	11:50:00	2102.298	68.596
08/08/24	09:23:00	2084.061	76.851	08/08/24	10:37:00	2099.580	68.165	08/08/24	11:51:00	2102.355	68.602
08/08/24	09:24:00	2084.908	76.594	08/08/24	10:38:00	2099.676	68.177	08/08/24	11:52:00	2102.381	68.599
08/08/24	09:25:00	2085.854	76.342	08/08/24	10:39:00	2099.767	68.190	08/08/24	11:53:00	2102.451	68.608
08/08/24	09:26:00	2086.529	76.066	08/08/24	10:40:00	2099.767	68.199	08/08/24	11:54:00	2102.486	68.613
08/08/24	09:27:00	2087.322	75.717	08/08/24	10:41:00	2099.787	68.211	08/08/24	11:55:00	2102.530	68.616
08/08/24	09:28:00	2087.891	75.314	08/08/24	10:42:00	2099.832	68.222	08/08/24	11:56:00	2102.573	68.618
08/08/24	09:29:00	2088.514	74.839	08/08/24	10:43:00	2099.909	68.240	08/08/24	11:57:00	2102.611	68.620
08/08/24	09:30:00	2089.250	74.352	08/08/24	10:44:00	2099.939	68.248	08/08/24	11:58:00	2102.662	68.624
08/08/24	09:31:00	2089.714	73.848	08/08/24	10:45:00	2099.937	68.260	08/08/24	11:59:00	2102.684	68.628
08/08/24	09:32:00	2090.075	73.354	08/08/24	10:46:00	2099.966	68.265	08/08/24	12:00:00	2102.745	68.635
08/08/24	09:33:00	2090.648	72.890	08/08/24	10:47:00	2099.987	68.280	08/08/24	12:01:00	2102.800	68.638
08/08/24	09:34:00	2090.980	72.455	08/08/24	10:48:00	2099.989	68.287	08/08/24	12:02:00	2102.844	68.645
08/08/24	09:35:00	2091.439	72.041	08/08/24	10:49:00	2099.995	68.293	08/08/24	12:03:00	2102.865	68.640
08/08/24	09:36:00	2092.024	71.609	08/08/24	10:50:00	2099.968	68.302	08/08/24	12:04:00	2102.918	68.649
08/08/24	09:37:00	2092.254	71.243	08/08/24	10:51:00	2099.942	68.311	08/08/24	12:05:00	2102.926	68.649
08/08/24	09:38:00	2092.562	70.853	08/08/24	10:52:00	2099.900	68.317	08/08/24	12:06:00	2102.995	68.664
08/08/24	09:39:00	2092.928	70.485	08/08/24	10:53:00	2099.783	68.322	08/08/24	12:07:00	2103.024	68.669
08/08/24	09:40:00	2093.176	70.143	08/08/24	10:54:00	2099.926	68.334	08/08/24	12:08:00	2103.068	68.672
08/08/24	09:41:00	2093.296	69.846	08/08/24	10:55:00	2100.045	68.341	08/08/24	12:09:00	2103.126	68.678
08/08/24	09:42:00	2093.400	69.586	08/08/24	10:56:00	2100.130	68.347	08/08/24	12:10:00	2103.180	68.684
08/08/24	09:43:00	2093.554	69.363	08/08/24	10:57:00	2100.148	68.352	08/08/24	12:11:00	2103.193	68.687
08/08/24	09:44:00	2093.907	69.155	08/08/24	10:58:00	2100.212	68.360	08/08/24	12:12:00	2103.257	68.698
08/08/24	09:45:00	2094.161	68.942	08/08/24	10:59:00	2100.249	68.367	08/08/24	12:13:00	2103.290	68.698
08/08/24	09:46:00	2094.479	68.758	08/08/24	11:00:00	2100.283	68.376	08/08/24	12:14:00	2103.354	68.700
08/08/24	09:47:00	2094.646	68.566	08/08/24	11:01:00	2100.314	68.373	08/08/24	12:15:00	2103.383	68.699
08/08/24	09:48:00	2094.834	68.378	08/08/24	11:02:00	2100.355	68.383	08/08/24	12:16:00	2103.435	68.702
08/08/24	09:49:00	2094.979	68.208	08/08/24	11:03:00	2100.385	68.389	08/08/24	12:17:00	2103.505	68.711
08/08/24	09:50:00	2094.951	68.060	08/08/24	11:04:00	2100.427	68.394	08/08/24	12:18:00	2103.548	68.718
08/08/24	09:51:00	2095.165	67.919	08/08/24	11:05:00	2100.420	68.394	08/08/24	12:19:00	2103.554	68.718
08/08/24	09:52:00	2095.330	67.756	08/08/24	11:06:00	2100.479	68.404	08/08/24	12:20:00	2103.633	68.721
08/08/24	09:53:00	2095.553	67.598	08/08/24	11:07:00	2100.554	68.415	08/08/24	12:21:00	2103.671	68.724
08/08/24	09:54:00	2095.694	67.438	08/08/24	11:08:00	2100.592	68.420	08/08/24	12:22:00	2103.717	68.729
08/08/24	09:55:00	2095.776	67.262	08/08/24	11:09:00	2100.625	68.418	08/08/24	12:23:00	2103.753	68.726
08/08/24	09:56:00	2095.862	67.106	08/08/24	11:10:00	2100.661	68.430	08/08/24	12:24:00	2103.858	68.732
08/08/24	09:57:00	2095.992	66.952	08/08/24	11:11:00	2100.692	68.432	08/08/24	12:25:00	2103.892	68.735
08/08/24	09:58:00	2096.169	66.824	08/08/24	11:12:00	2100.743	68.439	08/08/24	12:26:00	2103.935	68.737
08/08/24	09:59:00	2096.295	66.702	08/08/24	11:13:00	2100.767	68.440	08/08/24	12:27:00	2103.970	68.734
08/08/24	10:00:00	2096.520	66.576	08/08/24	11:14:00	2100.844	68.447	08/08/24	12:28:00	2104.026	68.741
08/08/24	10:01:00	2096.586	66.451	08/08/24	11:15:00	2100.871	68.447	08/08/24	12:29:00	2104.032	68.737
08/08/24	10:02:00	2096.703	66.336	08/08/24	11:16:00	2100.932	68.452	08/08/24	12:30:00	2104.076	68.741
08/08/24	10:03:00	2096.872	66.205	08/08/24	11:17:00	2100.952	68.452	08/08/24	12:31:00	2104.131	68.744
08/08/24	10:04:00	2096.879	66.082	08/08/24	11:18:00	2101.021	68.462	08/08/24	12:32:00	2104.181	68.743
08/08/24	10:05:00	2097.059	65.962	08/08/24	11:19:00	2101.072	68.468	08/08/24	12:33:00	2104.233	68.755
08/08/24	10:06:00	2097.139	65.845	08/08/24	11:20:00	2101.078	68.468	08/08/24	12:34:00	2104.276	68.755
08/08/24	10:07:00	2097.124	65.735	08/08/24	11:21:00	2101.150	68.477	08/08/24	12:35:00	2104.332	68.754
08/08/24	10:08:00	2097.243	65.636	08/08/24	11:22:00	2101.190	68.478	08/08/24	12:36:00	2104.379	68.747
08/08/24	10:09:00	2097.340	65.540	08/08/24	11:23:00	2101.246	68.481	08/08/24	12:37:00	2104.446	68.752
08/08/24	10:10:00	2097.460	65.505	08/08/24	11:24:00	2101.279	68.484	08/08/24	12:38:00	2104.497	68.753
08/08/24	10:11:00	2097.571	65.534	08/08/24	11:25:00	2101.340	68.495	08/08/24	12:39:00	2104.522	68.757
08/08/24	10:12:00	2097.837	65.697	08/08/24	11:26:00	2101.353	68.502	08/08/24	12:40:00	2104.546	68.758
08/08/24	10:13:00	2097.906	65.959	08/08/24	11:27:00	2101.400	68.508	08/08/24	12:41:00	2104.597	68.759

APPENDIX H, Continued
Pressure/Time Data Recorded During the Pressure Transient Test

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/08/24	12:42:00	2104.625	68.762	08/08/24	14:03:00	2107.988	68.835	08/08/24	15:24:00	2110.173	68.860
08/08/24	12:43:00	2104.664	68.762	08/08/24	14:04:00	2108.014	68.828	08/08/24	15:25:00	2110.186	68.859
08/08/24	12:44:00	2104.704	68.763	08/08/24	14:05:00	2108.082	68.832	08/08/24	15:26:00	2110.237	68.860
08/08/24	12:45:00	2104.775	68.766	08/08/24	14:06:00	2108.119	68.829	08/08/24	15:27:00	2110.257	68.855
08/08/24	12:46:00	2104.806	68.767	08/08/24	14:07:00	2108.134	68.827	08/08/24	15:28:00	2110.308	68.861
08/08/24	12:47:00	2104.845	68.772	08/08/24	14:08:00	2108.157	68.832	08/08/24	15:29:00	2110.340	68.850
08/08/24	12:48:00	2104.875	68.769	08/08/24	14:09:00	2108.157	68.832	08/08/24	15:30:00	2110.346	68.852
08/08/24	12:49:00	2104.905	68.766	08/08/24	14:10:00	2108.194	68.838	08/08/24	15:31:00	2110.376	68.854
08/08/24	12:50:00	2104.964	68.774	08/08/24	14:11:00	2108.197	68.837	08/08/24	15:32:00	2110.415	68.857
08/08/24	12:51:00	2105.000	68.774	08/08/24	14:12:00	2108.241	68.839	08/08/24	15:33:00	2110.442	68.852
08/08/24	12:52:00	2104.992	68.779	08/08/24	14:13:00	2108.296	68.840	08/08/24	15:34:00	2110.488	68.853
08/08/24	12:53:00	2105.015	68.780	08/08/24	14:14:00	2108.337	68.841	08/08/24	15:35:00	2110.550	68.852
08/08/24	12:54:00	2105.058	68.775	08/08/24	14:15:00	2108.367	68.840	08/08/24	15:36:00	2110.598	68.850
08/08/24	12:55:00	2105.108	68.780	08/08/24	14:16:00	2108.347	68.841	08/08/24	15:37:00	2110.651	68.854
08/08/24	12:56:00	2105.159	68.788	08/08/24	14:17:00	2108.224	68.843	08/08/24	15:38:00	2110.682	68.850
08/08/24	12:57:00	2105.184	68.781	08/08/24	14:18:00	2108.193	68.846	08/08/24	15:39:00	2110.730	68.858
08/08/24	12:58:00	2105.240	68.782	08/08/24	14:19:00	2108.193	68.841	08/08/24	15:40:00	2110.744	68.853
08/08/24	12:59:00	2105.278	68.786	08/08/24	14:20:00	2108.186	68.843	08/08/24	15:41:00	2110.769	68.848
08/08/24	13:00:00	2105.328	68.789	08/08/24	14:21:00	2108.227	68.845	08/08/24	15:42:00	2110.794	68.851
08/08/24	13:01:00	2105.368	68.788	08/08/24	14:22:00	2108.274	68.844	08/08/24	15:43:00	2110.829	68.850
08/08/24	13:02:00	2105.412	68.786	08/08/24	14:23:00	2108.287	68.841	08/08/24	15:44:00	2110.853	68.847
08/08/24	13:03:00	2105.467	68.789	08/08/24	14:24:00	2108.358	68.843	08/08/24	15:45:00	2110.906	68.845
08/08/24	13:04:00	2105.505	68.793	08/08/24	14:25:00	2108.374	68.851	08/08/24	15:46:00	2110.945	68.847
08/08/24	13:05:00	2105.556	68.792	08/08/24	14:26:00	2108.311	68.844	08/08/24	15:47:00	2110.971	68.849
08/08/24	13:06:00	2105.603	68.789	08/08/24	14:27:00	2108.340	68.853	08/08/24	15:48:00	2110.999	68.847
08/08/24	13:07:00	2105.643	68.797	08/08/24	14:28:00	2108.357	68.851	08/08/24	15:49:00	2111.020	68.847
08/08/24	13:08:00	2105.650	68.793	08/08/24	14:29:00	2108.381	68.846	08/08/24	15:50:00	2111.051	68.843
08/08/24	13:09:00	2105.705	68.794	08/08/24	14:30:00	2108.417	68.850	08/08/24	15:51:00	2111.084	68.843
08/08/24	13:10:00	2105.745	68.792	08/08/24	14:31:00	2108.456	68.850	08/08/24	15:52:00	2111.144	68.850
08/08/24	13:11:00	2105.749	68.792	08/08/24	14:32:00	2108.472	68.850	08/08/24	15:53:00	2111.179	68.851
08/08/24	13:12:00	2105.795	68.802	08/08/24	14:33:00	2108.508	68.843	08/08/24	15:54:00	2111.195	68.845
08/08/24	13:13:00	2105.819	68.803	08/08/24	14:34:00	2108.585	68.852	08/08/24	15:55:00	2111.224	68.845
08/08/24	13:14:00	2105.873	68.799	08/08/24	14:35:00	2108.619	68.853	08/08/24	15:56:00	2111.269	68.846
08/08/24	13:15:00	2105.925	68.802	08/08/24	14:36:00	2108.654	68.854	08/08/24	15:57:00	2111.352	68.845
08/08/24	13:16:00	2105.964	68.798	08/08/24	14:37:00	2108.672	68.851	08/08/24	15:58:00	2111.385	68.843
08/08/24	13:17:00	2105.992	68.803	08/08/24	14:38:00	2108.737	68.853	08/08/24	15:59:00	2111.435	68.846
08/08/24	13:18:00	2106.053	68.808	08/08/24	14:39:00	2108.763	68.853	08/08/24	16:00:00	2111.448	68.840
08/08/24	13:19:00	2106.132	68.807	08/08/24	14:40:00	2108.773	68.852	08/08/24	16:01:00	2111.466	68.841
08/08/24	13:20:00	2106.185	68.805	08/08/24	14:41:00	2108.792	68.854	08/08/24	16:02:00	2111.504	68.841
08/08/24	13:21:00	2106.242	68.804	08/08/24	14:42:00	2108.835	68.851	08/08/24	16:03:00	2111.578	68.843
08/08/24	13:22:00	2106.308	68.812	08/08/24	14:43:00	2108.879	68.854	08/08/24	16:04:00	2111.639	68.842
08/08/24	13:23:00	2106.329	68.807	08/08/24	14:44:00	2108.906	68.858	08/08/24	16:05:00	2111.692	68.844
08/08/24	13:24:00	2106.361	68.805	08/08/24	14:45:00	2108.942	68.860	08/08/24	16:06:00	2111.741	68.840
08/08/24	13:25:00	2106.395	68.808	08/08/24	14:46:00	2108.958	68.857	08/08/24	16:07:00	2111.724	68.839
08/08/24	13:26:00	2106.429	68.806	08/08/24	14:47:00	2109.002	68.860	08/08/24	16:08:00	2111.711	68.834
08/08/24	13:27:00	2106.502	68.812	08/08/24	14:48:00	2109.024	68.862	08/08/24	16:09:00	2111.710	68.836
08/08/24	13:28:00	2106.538	68.813	08/08/24	14:49:00	2109.056	68.858	08/08/24	16:10:00	2111.751	68.837
08/08/24	13:29:00	2106.584	68.810	08/08/24	14:50:00	2109.108	68.860	08/08/24	16:11:00	2111.777	68.833
08/08/24	13:30:00	2106.616	68.812	08/08/24	14:51:00	2109.151	68.864	08/08/24	16:12:00	2111.915	68.840
08/08/24	13:31:00	2106.643	68.810	08/08/24	14:52:00	2109.173	68.862	08/08/24	16:13:00	2111.891	68.839
08/08/24	13:32:00	2106.681	68.812	08/08/24	14:53:00	2109.230	68.863	08/08/24	16:14:00	2111.870	68.840
08/08/24	13:33:00	2106.743	68.816	08/08/24	14:54:00	2109.276	68.867	08/08/24	16:15:00	2111.871	68.838
08/08/24	13:34:00	2106.786	68.818	08/08/24	14:55:00	2109.318	68.868	08/08/24	16:16:00	2111.871	68.836
08/08/24	13:35:00	2106.833	68.820	08/08/24	14:56:00	2109.341	68.865	08/08/24	16:17:00	2111.889	68.839
08/08/24	13:36:00	2106.853	68.815	08/08/24	14:57:00	2109.389	68.869	08/08/24	16:18:00	2111.907	68.842
08/08/24	13:37:00	2106.903	68.815	08/08/24	14:58:00	2109.432	68.871	08/08/24	16:19:00	2111.909	68.836
08/08/24	13:38:00	2106.921	68.814	08/08/24	14:59:00	2109.464	68.867	08/08/24	16:20:00	2111.963	68.838
08/08/24	13:39:00	2106.985	68.823	08/08/24	15:00:00	2109.486	68.865	08/08/24	16:21:00	2111.988	68.833
08/08/24	13:40:00	2107.035	68.823	08/08/24	15:01:00	2109.489	68.864	08/08/24	16:22:00	2112.044	68.834
08/08/24	13:41:00	2107.101	68.828	08/08/24	15:02:00	2109.551	68.869	08/08/24	16:23:00	2112.064	68.836
08/08/24	13:42:00	2107.118	68.818	08/08/24	15:03:00	2109.600	68.867	08/08/24	16:24:00	2112.041	68.831
08/08/24	13:43:00	2107.195	68.823	08/08/24	15:04:00	2109.594	68.863	08/08/24	16:25:00	2112.062	68.835
08/08/24	13:44:00	2107.221	68.818	08/08/24	15:05:00	2109.605	68.857	08/08/24	16:26:00	2112.063	68.831
08/08/24	13:45:00	2107.273	68.824	08/08/24	15:06:00	2109.658	68.865	08/08/24	16:27:00	2112.109	68.832
08/08/24	13:46:00	2107.313	68.823	08/08/24	15:07:00	2109.638	68.859	08/08/24	16:28:00	2112.125	68.830
08/08/24	13:47:00	2107.352	68.823	08/08/24	15:08:00	2109.667	68.862	08/08/24	16:29:00	2112.172	68.832
08/08/24	13:48:00	2107.410	68.825	08/08/24	15:09:00	2109.703	68.868	08/08/24	16:30:00	2112.198	68.833
08/08/24	13:49:00	2107.433	68.830	08/08/24	15:10:00	2109.725	68.870	08/08/24	16:31:00	2112.246	68.834
08/08/24	13:50:00	2107.443	68.823	08/08/24	15:11:00	2109.737	68.873	08/08/24	16:32:00	2112.285	68.836
08/08/24	13:51:00	2107.506	68.833	08/08/24	15:12:00	2109.768	68.866	08/08/24	16:33:00	2112.326	68.835
08/08/24	13:52:00	2107.542	68.830	08/08/24	15:13:00	2109.837	68.870	08/08/24	16:34:00	2112.380	68.831
08/08/24	13:53:00	2107.580	68.835	08/08/24	15:14:00	2109.836	68.859	08/08/24	16:35:00	2112.432	68.830
08/08/24	13:54:00	2107.583	68.827	08/08/24	15:15:00	2109.897	68.872	08/08/24	16:36:00	2112.506	68.830
08/08/24	13:55:00	2107.636	68.834	08/08/24	15:16:00	2109.927	68.867	08/08/24	16:37:00	2112.589	68.831
08/08/24	13:56:00	2107.668	68.825	08/08/24	15:17:00	2109.949	68.861	08/08/24	16:38:00	2112.615	68.824
08/08/24	13:57:00	2107.716	68.831	08/08/24	15:18:00	2109.955	68.857	08/08/24	16:39:00	2112.640	68.824
08/08/24	13:58:00	2107.763	68.826	08/08/24	15:19:00	2110.022	68.864	08/08/24	16:40:00	2112.679	68.826
08/08/24	13:59:00	2107.833	68.827	08/08/24	15:20:00	2110.032	68.858	08/08/24	16:41:00	2112.712	68.835
08/08/24	14:00:00	2107.868	68.830	08/08/24	15:21:00	2110.065	68.858	08/08/24	16:42:00	2112.748	68.826
08/08/24	14:01:00	2107.919	68.829	08/08/24	15:22:00	2110.096	68.860	08/08/24	16:43:00	2112.805	68.823
08/08/24	14:02:00	2107.948	68.827	08/08/24	15:23:00	2110.129	68.862	08/08/24	16:44:00	2112.830	68.823

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/08/24	16:45:00	2112.754	68.829	08/08/24	18:06:00	2114.745	68.818	08/08/24	19:27:00	2115.928	68.817
08/08/24	16:46:00	2112.765	68.829	08/08/24	18:07:00	2114.722	68.811	08/08/24	19:28:00	2115.945	68.823
08/08/24	16:47:00	2112.807	68.830	08/08/24	18:08:00	2114.582	68.815	08/08/24	19:29:00	2115.954	68.818
08/08/24	16:48:00	2112.858	68.823	08/08/24	18:09:00	2114.536	68.816	08/08/24	19:30:00	2115.958	68.816
08/08/24	16:49:00	2112.916	68.825	08/08/24	18:10:00	2114.559	68.821	08/08/24	19:31:00	2115.985	68.809
08/08/24	16:50:00	2112.948	68.824	08/08/24	18:11:00	2114.568	68.811	08/08/24	19:32:00	2116.019	68.810
08/08/24	16:51:00	2112.977	68.834	08/08/24	18:12:00	2114.686	68.818	08/08/24	19:33:00	2116.044	68.803
08/08/24	16:52:00	2113.000	68.830	08/08/24	18:13:00	2114.656	68.821	08/08/24	19:34:00	2116.073	68.793
08/08/24	16:53:00	2113.036	68.830	08/08/24	18:14:00	2114.466	68.812	08/08/24	19:35:00	2116.107	68.788
08/08/24	16:54:00	2113.073	68.823	08/08/24	18:15:00	2114.491	68.823	08/08/24	19:36:00	2116.116	68.787
08/08/24	16:55:00	2113.091	68.826	08/08/24	18:16:00	2114.492	68.820	08/08/24	19:37:00	2116.118	68.773
08/08/24	16:56:00	2113.096	68.822	08/08/24	18:17:00	2114.501	68.817	08/08/24	19:38:00	2116.150	68.773
08/08/24	16:57:00	2113.148	68.827	08/08/24	18:18:00	2114.525	68.822	08/08/24	19:39:00	2116.152	68.763
08/08/24	16:58:00	2113.179	68.827	08/08/24	18:19:00	2114.540	68.817	08/08/24	19:40:00	2116.199	68.763
08/08/24	16:59:00	2113.196	68.829	08/08/24	18:20:00	2114.563	68.818	08/08/24	19:41:00	2116.197	68.753
08/08/24	17:00:00	2113.186	68.823	08/08/24	18:21:00	2114.586	68.816	08/08/24	19:42:00	2116.229	68.753
08/08/24	17:01:00	2113.233	68.827	08/08/24	18:22:00	2114.604	68.819	08/08/24	19:43:00	2116.271	68.749
08/08/24	17:02:00	2113.266	68.823	08/08/24	18:23:00	2114.623	68.812	08/08/24	19:44:00	2116.291	68.744
08/08/24	17:03:00	2113.281	68.822	08/08/24	18:24:00	2114.642	68.813	08/08/24	19:45:00	2116.311	68.741
08/08/24	17:04:00	2113.316	68.821	08/08/24	18:25:00	2114.704	68.821	08/08/24	19:46:00	2116.332	68.739
08/08/24	17:05:00	2113.309	68.821	08/08/24	18:26:00	2114.707	68.818	08/08/24	19:47:00	2116.355	68.733
08/08/24	17:06:00	2113.334	68.822	08/08/24	18:27:00	2114.745	68.822	08/08/24	19:48:00	2116.388	68.740
08/08/24	17:07:00	2113.310	68.823	08/08/24	18:28:00	2114.732	68.815	08/08/24	19:49:00	2116.412	68.734
08/08/24	17:08:00	2113.345	68.827	08/08/24	18:29:00	2114.855	68.815	08/08/24	19:50:00	2116.428	68.736
08/08/24	17:09:00	2113.350	68.820	08/08/24	18:30:00	2114.952	68.823	08/08/24	19:51:00	2116.431	68.736
08/08/24	17:10:00	2113.381	68.824	08/08/24	18:31:00	2114.948	68.818	08/08/24	19:52:00	2116.475	68.732
08/08/24	17:11:00	2113.413	68.824	08/08/24	18:32:00	2114.932	68.824	08/08/24	19:53:00	2116.538	68.738
08/08/24	17:12:00	2113.441	68.824	08/08/24	18:33:00	2114.951	68.818	08/08/24	19:54:00	2116.545	68.740
08/08/24	17:13:00	2113.464	68.818	08/08/24	18:34:00	2115.013	68.818	08/08/24	19:55:00	2116.539	68.734
08/08/24	17:14:00	2113.507	68.825	08/08/24	18:35:00	2115.091	68.823	08/08/24	19:56:00	2116.579	68.737
08/08/24	17:15:00	2113.519	68.821	08/08/24	18:36:00	2115.132	68.822	08/08/24	19:57:00	2116.608	68.735
08/08/24	17:16:00	2113.547	68.822	08/08/24	18:37:00	2115.166	68.821	08/08/24	19:58:00	2116.649	68.743
08/08/24	17:17:00	2113.541	68.819	08/08/24	18:38:00	2115.168	68.819	08/08/24	19:59:00	2116.681	68.737
08/08/24	17:18:00	2113.567	68.819	08/08/24	18:39:00	2115.142	68.822	08/08/24	20:00:00	2116.693	68.741
08/08/24	17:19:00	2113.612	68.822	08/08/24	18:40:00	2115.081	68.817	08/08/24	20:01:00	2116.722	68.744
08/08/24	17:20:00	2113.611	68.817	08/08/24	18:41:00	2115.108	68.819	08/08/24	20:02:00	2116.750	68.745
08/08/24	17:21:00	2113.624	68.820	08/08/24	18:42:00	2115.107	68.823	08/08/24	20:03:00	2116.747	68.741
08/08/24	17:22:00	2113.638	68.819	08/08/24	18:43:00	2115.106	68.820	08/08/24	20:04:00	2116.759	68.744
08/08/24	17:23:00	2113.671	68.822	08/08/24	18:44:00	2115.123	68.818	08/08/24	20:05:00	2116.802	68.744
08/08/24	17:24:00	2113.721	68.822	08/08/24	18:45:00	2115.146	68.819	08/08/24	20:06:00	2116.809	68.751
08/08/24	17:25:00	2113.731	68.822	08/08/24	18:46:00	2115.178	68.817	08/08/24	20:07:00	2116.834	68.759
08/08/24	17:26:00	2113.757	68.824	08/08/24	18:47:00	2115.345	68.817	08/08/24	20:08:00	2116.846	68.760
08/08/24	17:27:00	2113.802	68.818	08/08/24	18:48:00	2115.436	68.819	08/08/24	20:09:00	2116.875	68.760
08/08/24	17:28:00	2113.856	68.818	08/08/24	18:49:00	2115.477	68.821	08/08/24	20:10:00	2116.936	68.769
08/08/24	17:29:00	2113.857	68.817	08/08/24	18:50:00	2115.511	68.821	08/08/24	20:11:00	2116.922	68.768
08/08/24	17:30:00	2113.892	68.818	08/08/24	18:51:00	2115.550	68.818	08/08/24	20:12:00	2116.928	68.771
08/08/24	17:31:00	2113.906	68.815	08/08/24	18:52:00	2115.600	68.825	08/08/24	20:13:00	2116.993	68.777
08/08/24	17:32:00	2113.956	68.818	08/08/24	18:53:00	2115.527	68.821	08/08/24	20:14:00	2117.032	68.772
08/08/24	17:33:00	2113.995	68.814	08/08/24	18:54:00	2115.430	68.817	08/08/24	20:15:00	2117.066	68.774
08/08/24	17:34:00	2114.014	68.817	08/08/24	18:55:00	2115.315	68.818	08/08/24	20:16:00	2022.302	68.772
08/08/24	17:35:00	2114.028	68.817	08/08/24	18:56:00	2115.325	68.818	08/08/24	20:17:00	1944.808	68.776
08/08/24	17:36:00	2114.056	68.819	08/08/24	18:57:00	2115.307	68.815	08/08/24	20:18:00	1923.718	68.802
08/08/24	17:37:00	2114.075	68.818	08/08/24	18:58:00	2115.351	68.822	08/08/24	20:19:00	1913.100	68.834
08/08/24	17:38:00	2114.082	68.821	08/08/24	18:59:00	2115.353	68.814	08/08/24	20:20:00	1906.457	68.866
08/08/24	17:39:00	2114.110	68.823	08/08/24	19:00:00	2115.367	68.813	08/08/24	20:21:00	1902.073	68.888
08/08/24	17:40:00	2114.118	68.820	08/08/24	19:01:00	2115.387	68.819	08/08/24	20:22:00	1898.633	68.915
08/08/24	17:41:00	2114.123	68.818	08/08/24	19:02:00	2115.392	68.819	08/08/24	20:23:00	1896.334	68.950
08/08/24	17:42:00	2114.167	68.816	08/08/24	19:03:00	2115.424	68.819	08/08/24	20:24:00	1894.372	68.982
08/08/24	17:43:00	2114.192	68.813	08/08/24	19:04:00	2115.475	68.820	08/08/24	20:25:00	1892.969	69.015
08/08/24	17:44:00	2114.220	68.820	08/08/24	19:05:00	2115.496	68.824	08/08/24	20:26:00	1891.554	69.030
08/08/24	17:45:00	2114.225	68.820	08/08/24	19:06:00	2115.498	68.816	08/08/24	20:27:00	1890.575	69.044
08/08/24	17:46:00	2114.250	68.822	08/08/24	19:07:00	2115.533	68.826	08/08/24	20:28:00	1889.625	69.063
08/08/24	17:47:00	2114.285	68.816	08/08/24	19:08:00	2115.580	68.821	08/08/24	20:29:00	1888.829	69.094
08/08/24	17:48:00	2114.307	68.814	08/08/24	19:09:00	2115.586	68.821	08/08/24	20:30:00	1888.066	69.136
08/08/24	17:49:00	2114.330	68.813	08/08/24	19:10:00	2115.582	68.818	08/08/24	20:31:00	1887.627	69.161
08/08/24	17:50:00	2114.341	68.815	08/08/24	19:11:00	2115.594	68.816	08/08/24	20:32:00	1887.018	69.176
08/08/24	17:51:00	2114.366	68.817	08/08/24	19:12:00	2115.614	68.818	08/08/24	20:33:00	1886.500	69.199
08/08/24	17:52:00	2114.363	68.815	08/08/24	19:13:00	2115.658	68.820	08/08/24	20:34:00	1886.120	69.226
08/08/24	17:53:00	2114.406	68.815	08/08/24	19:14:00	2115.679	68.824	08/08/24	20:35:00	1885.675	69.248
08/08/24	17:54:00	2114.431	68.815	08/08/24	19:15:00	2115.692	68.821	08/08/24	20:36:00	1885.280	69.268
08/08/24	17:55:00	2114.467	68.820	08/08/24	19:16:00	2115.682	68.821	08/08/24	20:37:00	1884.945	69.291
08/08/24	17:56:00	2114.502	68.821	08/08/24	19:17:00	2115.722	68.824	08/08/24	20:38:00	1884.630	69.304
08/08/24	17:57:00	2114.517	68.815	08/08/24	19:18:00	2115.728	68.816	08/08/24	20:39:00	1884.297	69.306
08/08/24	17:58:00	2114.542	68.820	08/08/24	19:19:00	2115.743	68.822	08/08/24	20:40:00	1884.052	69.323
08/08/24	17:59:00	2114.559	68.816	08/08/24	19:20:00	2115.758	68.817	08/08/24	20:41:00	1883.805	69.350
08/08/24	18:00:00	2114.583	68.818	08/08/24	19:21:00	2115.791	68.820	08/08/24	20:42:00	1883.535	69.376
08/08/24	18:01:00	2114.595	68.816	08/08/24	19:22:00	2115.802	68.816	08/08/24	20:43:00	1883.273	69.388
08/08/24	18:02:00	2114.625	68.815	08/08/24	19:23:00	2115.857	68.824	08/08/24	20:44:00	1883.114	69.403
08/08/24	18:03:00	2114.656	68.817	08/08/24	19:24:00	2115.860	68.821	08/08/24	20:45:00	1882.884	69.416
08/08/24	18:04:00	2114.707	68.820	08/08/24	19:25:00	2115.908	68.826	08/08/24	20:46:00	1882.614	69.429
08/08/24	18:05:00	2114.714	68.818	08/08/24	19:26:00	2115.915	68.824	08/08/24	20:47:00	1882.497	69.440

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/08/24	20:48:00	1882.257	69.457	08/08/24	22:09:00	1875.775	70.578	08/08/24	23:30:00	1873.349	71.131
08/08/24	20:49:00	1882.052	69.487	08/08/24	22:10:00	1875.743	70.571	08/08/24	23:31:00	1873.332	71.130
08/08/24	20:50:00	1881.949	69.509	08/08/24	22:11:00	1875.725	70.582	08/08/24	23:32:00	1873.299	71.147
08/08/24	20:51:00	1881.749	69.522	08/08/24	22:12:00	1875.667	70.589	08/08/24	23:33:00	1873.260	71.149
08/08/24	20:52:00	1881.648	69.547	08/08/24	22:13:00	1875.628	70.601	08/08/24	23:34:00	1873.260	71.153
08/08/24	20:53:00	1881.435	69.565	08/08/24	22:14:00	1875.611	70.605	08/08/24	23:35:00	1873.241	71.159
08/08/24	20:54:00	1881.284	69.595	08/08/24	22:15:00	1875.589	70.610	08/08/24	23:36:00	1873.198	71.164
08/08/24	20:55:00	1881.191	69.623	08/08/24	22:16:00	1875.573	70.632	08/08/24	23:37:00	1873.168	71.158
08/08/24	20:56:00	1880.957	69.634	08/08/24	22:17:00	1875.516	70.656	08/08/24	23:38:00	1873.158	71.158
08/08/24	20:57:00	1880.896	69.638	08/08/24	22:18:00	1875.476	70.668	08/08/24	23:39:00	1873.135	71.163
08/08/24	20:58:00	1880.749	69.654	08/08/24	22:19:00	1875.419	70.671	08/08/24	23:40:00	1873.123	71.162
08/08/24	20:59:00	1880.600	69.674	08/08/24	22:20:00	1875.368	70.668	08/08/24	23:41:00	1873.099	71.163
08/08/24	21:00:00	1880.518	69.699	08/08/24	22:21:00	1875.313	70.669	08/08/24	23:42:00	1873.068	71.161
08/08/24	21:01:00	1880.398	69.720	08/08/24	22:22:00	1875.281	70.679	08/08/24	23:43:00	1873.073	71.183
08/08/24	21:02:00	1880.282	69.742	08/08/24	22:23:00	1875.267	70.678	08/08/24	23:44:00	1873.038	71.191
08/08/24	21:03:00	1880.136	69.759	08/08/24	22:24:00	1875.251	70.692	08/08/24	23:45:00	1872.983	71.171
08/08/24	21:04:00	1880.042	69.765	08/08/24	22:25:00	1875.213	70.704	08/08/24	23:46:00	1872.999	71.169
08/08/24	21:05:00	1879.892	69.782	08/08/24	22:26:00	1875.167	70.719	08/08/24	23:47:00	1872.999	71.186
08/08/24	21:06:00	1879.822	69.793	08/08/24	22:27:00	1875.156	70.738	08/08/24	23:48:00	1872.995	71.215
08/08/24	21:07:00	1879.724	69.817	08/08/24	22:28:00	1875.127	70.767	08/08/24	23:49:00	1872.943	71.221
08/08/24	21:08:00	1879.663	69.833	08/08/24	22:29:00	1875.035	70.752	08/08/24	23:50:00	1872.921	71.230
08/08/24	21:09:00	1879.574	69.858	08/08/24	22:30:00	1875.004	70.747	08/08/24	23:51:00	1872.907	71.241
08/08/24	21:10:00	1879.432	69.874	08/08/24	22:31:00	1874.986	70.744	08/08/24	23:52:00	1872.881	71.256
08/08/24	21:11:00	1879.364	69.896	08/08/24	22:32:00	1874.932	70.725	08/08/24	23:53:00	1872.851	71.252
08/08/24	21:12:00	1879.226	69.906	08/08/24	22:33:00	1874.920	70.729	08/08/24	23:54:00	1872.847	71.255
08/08/24	21:13:00	1879.158	69.919	08/08/24	22:34:00	1874.881	70.731	08/08/24	23:55:00	1872.829	71.261
08/08/24	21:14:00	1879.029	69.936	08/08/24	22:35:00	1874.878	70.749	08/08/24	23:56:00	1872.775	71.266
08/08/24	21:15:00	1878.929	69.937	08/08/24	22:36:00	1874.831	70.766	08/08/24	23:57:00	1872.743	71.273
08/08/24	21:16:00	1878.871	69.949	08/08/24	22:37:00	1874.786	70.773	08/08/24	23:58:00	1872.732	71.264
08/08/24	21:17:00	1878.803	69.950	08/08/24	22:38:00	1874.769	70.782	08/08/24	23:59:00	1872.708	71.270
08/08/24	21:18:00	1878.733	69.962	08/08/24	22:39:00	1874.746	70.796	08/09/24	00:00:00	1872.716	71.278
08/08/24	21:19:00	1878.672	69.995	08/08/24	22:40:00	1874.712	70.812	08/09/24	00:01:00	1872.703	71.270
08/08/24	21:20:00	1878.592	70.038	08/08/24	22:41:00	1874.693	70.841	08/09/24	00:02:00	1872.674	71.269
08/08/24	21:21:00	1878.500	70.055	08/08/24	22:42:00	1874.661	70.868	08/09/24	00:03:00	1872.663	71.286
08/08/24	21:22:00	1878.434	70.061	08/08/24	22:43:00	1874.632	70.884	08/09/24	00:04:00	1872.620	71.283
08/08/24	21:23:00	1878.359	70.078	08/08/24	22:44:00	1874.578	70.886	08/09/24	00:05:00	1872.597	71.290
08/08/24	21:24:00	1878.269	70.095	08/08/24	22:45:00	1874.537	70.895	08/09/24	00:06:00	1872.602	71.304
08/08/24	21:25:00	1878.199	70.103	08/08/24	22:46:00	1874.491	70.890	08/09/24	00:07:00	1872.596	71.314
08/08/24	21:26:00	1878.143	70.111	08/08/24	22:47:00	1874.432	70.877	08/09/24	00:08:00	1872.558	71.311
08/08/24	21:27:00	1878.081	70.131	08/08/24	22:48:00	1874.416	70.888	08/09/24	00:09:00	1872.521	71.306
08/08/24	21:28:00	1877.988	70.145	08/08/24	22:49:00	1874.396	70.894	08/09/24	00:10:00	1872.512	71.319
08/08/24	21:29:00	1877.888	70.170	08/08/24	22:50:00	1874.372	70.900	08/09/24	00:11:00	1872.513	71.336
08/08/24	21:30:00	1877.826	70.173	08/08/24	22:51:00	1874.332	70.904	08/09/24	00:12:00	1872.478	71.345
08/08/24	21:31:00	1877.790	70.201	08/08/24	22:52:00	1874.333	70.926	08/09/24	00:13:00	1872.457	71.336
08/08/24	21:32:00	1877.722	70.206	08/08/24	22:53:00	1874.306	70.930	08/09/24	00:14:00	1872.422	71.327
08/08/24	21:33:00	1877.648	70.221	08/08/24	22:54:00	1874.293	70.946	08/09/24	00:15:00	1872.414	71.321
08/08/24	21:34:00	1877.627	70.236	08/08/24	22:55:00	1874.229	70.944	08/09/24	00:16:00	1872.409	71.331
08/08/24	21:35:00	1877.549	70.256	08/08/24	22:56:00	1874.207	70.946	08/09/24	00:17:00	1872.379	71.339
08/08/24	21:36:00	1877.474	70.287	08/08/24	22:57:00	1874.172	70.955	08/09/24	00:18:00	1872.375	71.347
08/08/24	21:37:00	1877.436	70.306	08/08/24	22:58:00	1874.156	70.970	08/09/24	00:19:00	1872.357	71.354
08/08/24	21:38:00	1877.323	70.304	08/08/24	22:59:00	1874.110	70.954	08/09/24	00:20:00	1872.365	71.371
08/08/24	21:39:00	1877.262	70.301	08/08/24	23:00:00	1874.076	70.953	08/09/24	00:21:00	1872.328	71.384
08/08/24	21:40:00	1877.208	70.296	08/08/24	23:01:00	1874.077	70.965	08/09/24	00:22:00	1872.297	71.389
08/08/24	21:41:00	1877.178	70.314	08/08/24	23:02:00	1874.043	70.981	08/09/24	00:23:00	1872.267	71.368
08/08/24	21:42:00	1877.167	70.345	08/08/24	23:03:00	1874.021	70.991	08/09/24	00:24:00	1872.260	71.375
08/08/24	21:43:00	1877.050	70.350	08/08/24	23:04:00	1873.996	70.996	08/09/24	00:25:00	1872.272	71.393
08/08/24	21:44:00	1877.011	70.361	08/08/24	23:05:00	1873.960	71.000	08/09/24	00:26:00	1872.238	71.394
08/08/24	21:45:00	1876.944	70.363	08/08/24	23:06:00	1873.936	71.001	08/09/24	00:27:00	1872.233	71.407
08/08/24	21:46:00	1876.891	70.370	08/08/24	23:07:00	1873.900	70.999	08/09/24	00:28:00	1872.240	71.424
08/08/24	21:47:00	1876.870	70.392	08/08/24	23:08:00	1873.896	71.007	08/09/24	00:29:00	1872.191	71.421
08/08/24	21:48:00	1876.796	70.395	08/08/24	23:09:00	1873.886	71.022	08/09/24	00:30:00	1872.163	71.421
08/08/24	21:49:00	1876.731	70.395	08/08/24	23:10:00	1873.828	71.030	08/09/24	00:31:00	1872.159	71.431
08/08/24	21:50:00	1876.661	70.378	08/08/24	23:11:00	1873.801	71.022	08/09/24	00:32:00	1872.140	71.439
08/08/24	21:51:00	1876.631	70.374	08/08/24	23:12:00	1873.774	71.039	08/09/24	00:33:00	1872.098	71.435
08/08/24	21:52:00	1876.611	70.399	08/08/24	23:13:00	1873.763	71.056	08/09/24	00:34:00	1872.119	71.445
08/08/24	21:53:00	1876.540	70.406	08/08/24	23:14:00	1873.716	71.047	08/09/24	00:35:00	1872.097	71.459
08/08/24	21:54:00	1876.525	70.430	08/08/24	23:15:00	1873.711	71.064	08/09/24	00:36:00	1872.086	71.466
08/08/24	21:55:00	1876.493	70.468	08/08/24	23:16:00	1873.671	71.065	08/09/24	00:37:00	1872.066	71.469
08/08/24	21:56:00	1876.384	70.485	08/08/24	23:17:00	1873.639	71.073	08/09/24	00:38:00	1872.034	71.476
08/08/24	21:57:00	1876.345	70.501	08/08/24	23:18:00	1873.587	71.061	08/09/24	00:39:00	1872.003	71.477
08/08/24	21:58:00	1876.307	70.508	08/08/24	23:19:00	1873.593	71.057	08/09/24	00:40:00	1872.016	71.487
08/08/24	21:59:00	1876.255	70.504	08/08/24	23:20:00	1873.570	71.061	08/09/24	00:41:00	1871.992	71.498
08/08/24	22:00:00	1876.203	70.512	08/08/24	23:21:00	1873.546	71.067	08/09/24	00:42:00	1871.966	71.508
08/08/24	22:01:00	1876.178	70.520	08/08/24	23:22:00	1873.530	71.072	08/09/24	00:43:00	1871.949	71.506
08/08/24	22:02:00	1876.135	70.546	08/08/24	23:23:00	1873.507	71.086	08/09/24	00:44:00	1871.938	71.501
08/08/24	22:03:00	1876.071	70.552	08/08/24	23:24:00	1873.479	71.097	08/09/24	00:45:00	1871.915	71.495
08/08/24	22:04:00	1876.057	70.569	08/08/24	23:25:00	1873.466	71.101	08/09/24	00:46:00	1871.919	71.497
08/08/24	22:05:00	1876.023	70.585	08/08/24	23:26:00	1873.446	71.102	08/09/24	00:47:00	1871.897	71.504
08/08/24	22:06:00	1875.935	70.587	08/08/24	23:27:00	1873.433	71.110	08/09/24	00:48:00	1871.883	71.512
08/08/24	22:07:00	1875.915	70.595	08/08/24	23:28:00	1873.388	71.109	08/09/24	00:49:00	1871.876	71.526
08/08/24	22:08:00	1875.860	70.597	08/08/24	23:29:00	1873.369	71.130	08/09/24	00:50:00	1871.836	71.518

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/09/24	00:51:00	1871.839	71.531	08/09/24	02:12:00	1870.777	71.827	08/09/24	03:33:00	1869.971	72.045
08/09/24	00:52:00	1871.837	71.540	08/09/24	02:13:00	1870.771	71.831	08/09/24	03:34:00	1869.977	72.040
08/09/24	00:53:00	1871.823	71.553	08/09/24	02:14:00	1870.745	71.824	08/09/24	03:35:00	1869.968	72.046
08/09/24	00:54:00	1871.756	71.540	08/09/24	02:15:00	1870.728	71.815	08/09/24	03:36:00	1869.951	72.046
08/09/24	00:55:00	1871.725	71.516	08/09/24	02:16:00	1870.748	71.814	08/09/24	03:37:00	1869.963	72.056
08/09/24	00:56:00	1871.740	71.506	08/09/24	02:17:00	1870.742	71.823	08/09/24	03:38:00	1869.962	72.060
08/09/24	00:57:00	1871.759	71.512	08/09/24	02:18:00	1870.740	71.825	08/09/24	03:39:00	1869.948	72.066
08/09/24	00:58:00	1871.714	71.511	08/09/24	02:19:00	1870.706	71.819	08/09/24	03:40:00	1869.930	72.077
08/09/24	00:59:00	1871.720	71.521	08/09/24	02:20:00	1870.696	71.820	08/09/24	03:41:00	1869.910	72.078
08/09/24	01:00:00	1871.706	71.536	08/09/24	02:21:00	1870.660	71.818	08/09/24	03:42:00	1869.888	72.068
08/09/24	01:01:00	1871.696	71.547	08/09/24	02:22:00	1870.651	71.811	08/09/24	03:43:00	1869.895	72.066
08/09/24	01:02:00	1871.679	71.551	08/09/24	02:23:00	1870.662	71.816	08/09/24	03:44:00	1869.881	72.067
08/09/24	01:03:00	1871.659	71.547	08/09/24	02:24:00	1870.648	71.817	08/09/24	03:45:00	1869.872	72.065
08/09/24	01:04:00	1871.642	71.561	08/09/24	02:25:00	1870.623	71.821	08/09/24	03:46:00	1869.879	72.076
08/09/24	01:05:00	1871.616	71.566	08/09/24	02:26:00	1870.609	71.817	08/09/24	03:47:00	1869.863	72.078
08/09/24	01:06:00	1871.603	71.563	08/09/24	02:27:00	1870.630	71.829	08/09/24	03:48:00	1869.848	72.079
08/09/24	01:07:00	1871.582	71.558	08/09/24	02:28:00	1870.611	71.832	08/09/24	03:49:00	1869.833	72.087
08/09/24	01:08:00	1871.575	71.565	08/09/24	02:29:00	1870.601	71.840	08/09/24	03:50:00	1869.839	72.089
08/09/24	01:09:00	1871.561	71.561	08/09/24	02:30:00	1870.597	71.845	08/09/24	03:51:00	1869.834	72.094
08/09/24	01:10:00	1871.548	71.560	08/09/24	02:31:00	1870.604	71.863	08/09/24	03:52:00	1869.825	72.095
08/09/24	01:11:00	1871.542	71.567	08/09/24	02:32:00	1870.551	71.861	08/09/24	03:53:00	1869.821	72.106
08/09/24	01:12:00	1871.542	71.576	08/09/24	02:33:00	1870.547	71.866	08/09/24	03:54:00	1869.785	72.104
08/09/24	01:13:00	1871.537	71.594	08/09/24	02:34:00	1870.553	71.871	08/09/24	03:55:00	1869.782	72.098
08/09/24	01:14:00	1871.515	71.596	08/09/24	02:35:00	1870.520	71.883	08/09/24	03:56:00	1869.800	72.101
08/09/24	01:15:00	1871.469	71.594	08/09/24	02:36:00	1870.509	71.878	08/09/24	03:57:00	1869.798	72.110
08/09/24	01:16:00	1871.446	71.584	08/09/24	02:37:00	1870.526	71.876	08/09/24	03:58:00	1869.805	72.120
08/09/24	01:17:00	1871.471	71.595	08/09/24	02:38:00	1870.507	71.882	08/09/24	03:59:00	1869.773	72.125
08/09/24	01:18:00	1871.460	71.598	08/09/24	02:39:00	1870.505	71.881	08/09/24	04:00:00	1869.774	72.130
08/09/24	01:19:00	1871.423	71.593	08/09/24	02:40:00	1870.501	71.894	08/09/24	04:01:00	1869.723	72.134
08/09/24	01:20:00	1871.420	71.599	08/09/24	02:41:00	1870.492	71.890	08/09/24	04:02:00	1869.745	72.132
08/09/24	01:21:00	1871.406	71.607	08/09/24	02:42:00	1870.469	71.896	08/09/24	04:03:00	1869.734	72.129
08/09/24	01:22:00	1871.394	71.612	08/09/24	02:43:00	1870.462	71.901	08/09/24	04:04:00	1869.732	72.128
08/09/24	01:23:00	1871.362	71.612	08/09/24	02:44:00	1870.449	71.902	08/09/24	04:05:00	1869.720	72.133
08/09/24	01:24:00	1871.361	71.616	08/09/24	02:45:00	1870.430	71.915	08/09/24	04:06:00	1869.722	72.136
08/09/24	01:25:00	1871.347	71.627	08/09/24	02:46:00	1870.430	71.917	08/09/24	04:07:00	1869.728	72.143
08/09/24	01:26:00	1871.349	71.635	08/09/24	02:47:00	1870.422	71.931	08/09/24	04:08:00	1869.727	72.138
08/09/24	01:27:00	1871.347	71.639	08/09/24	02:48:00	1870.422	71.933	08/09/24	04:09:00	1869.703	72.142
08/09/24	01:28:00	1871.310	71.639	08/09/24	02:49:00	1870.417	71.931	08/09/24	04:10:00	1869.704	72.152
08/09/24	01:29:00	1871.295	71.632	08/09/24	02:50:00	1870.386	71.931	08/09/24	04:11:00	1869.697	72.151
08/09/24	01:30:00	1871.285	71.632	08/09/24	02:51:00	1870.365	71.925	08/09/24	04:12:00	1869.680	72.155
08/09/24	01:31:00	1871.280	71.637	08/09/24	02:52:00	1870.362	71.921	08/09/24	04:13:00	1869.657	72.155
08/09/24	01:32:00	1871.280	71.649	08/09/24	02:53:00	1870.339	71.918	08/09/24	04:14:00	1869.636	72.143
08/09/24	01:33:00	1871.277	71.663	08/09/24	02:54:00	1870.363	71.931	08/09/24	04:15:00	1869.647	72.148
08/09/24	01:34:00	1871.245	71.665	08/09/24	02:55:00	1870.360	71.939	08/09/24	04:16:00	1869.642	72.160
08/09/24	01:35:00	1871.255	71.670	08/09/24	02:56:00	1870.345	71.942	08/09/24	04:17:00	1869.645	72.169
08/09/24	01:36:00	1871.225	71.676	08/09/24	02:57:00	1870.333	71.949	08/09/24	04:18:00	1869.619	72.167
08/09/24	01:37:00	1871.193	71.685	08/09/24	02:58:00	1870.307	71.942	08/09/24	04:19:00	1869.594	72.168
08/09/24	01:38:00	1871.202	71.692	08/09/24	02:59:00	1870.285	71.939	08/09/24	04:20:00	1869.609	72.167
08/09/24	01:39:00	1871.164	71.699	08/09/24	03:00:00	1870.317	71.951	08/09/24	04:21:00	1869.602	72.169
08/09/24	01:40:00	1871.139	71.695	08/09/24	03:01:00	1870.272	71.948	08/09/24	04:22:00	1869.589	72.175
08/09/24	01:41:00	1871.116	71.684	08/09/24	03:02:00	1870.269	71.952	08/09/24	04:23:00	1869.568	72.173
08/09/24	01:42:00	1871.131	71.694	08/09/24	03:03:00	1870.268	71.956	08/09/24	04:24:00	1869.570	72.176
08/09/24	01:43:00	1871.136	71.703	08/09/24	03:04:00	1870.277	71.958	08/09/24	04:25:00	1869.577	72.180
08/09/24	01:44:00	1871.116	71.711	08/09/24	03:05:00	1870.247	71.966	08/09/24	04:26:00	1869.543	72.169
08/09/24	01:45:00	1871.106	71.721	08/09/24	03:06:00	1870.232	71.971	08/09/24	04:27:00	1869.545	72.173
08/09/24	01:46:00	1871.076	71.713	08/09/24	03:07:00	1870.203	71.963	08/09/24	04:28:00	1869.534	72.170
08/09/24	01:47:00	1871.066	71.705	08/09/24	03:08:00	1870.208	71.956	08/09/24	04:29:00	1869.550	72.170
08/09/24	01:48:00	1871.080	71.721	08/09/24	03:09:00	1870.191	71.950	08/09/24	04:30:00	1869.523	72.163
08/09/24	01:49:00	1871.059	71.736	08/09/24	03:10:00	1870.225	71.953	08/09/24	04:31:00	1869.503	72.158
08/09/24	01:50:00	1871.040	71.747	08/09/24	03:11:00	1870.200	71.971	08/09/24	04:32:00	1869.503	72.163
08/09/24	01:51:00	1870.995	71.749	08/09/24	03:12:00	1870.192	71.982	08/09/24	04:33:00	1869.490	72.158
08/09/24	01:52:00	1871.005	71.753	08/09/24	03:13:00	1870.159	71.987	08/09/24	04:34:00	1869.483	72.159
08/09/24	01:53:00	1871.015	71.760	08/09/24	03:14:00	1870.161	72.000	08/09/24	04:35:00	1869.500	72.160
08/09/24	01:54:00	1870.982	71.767	08/09/24	03:15:00	1870.172	72.000	08/09/24	04:36:00	1869.484	72.167
08/09/24	01:55:00	1870.953	71.754	08/09/24	03:16:00	1870.145	72.009	08/09/24	04:37:00	1869.466	72.171
08/09/24	01:56:00	1870.964	71.752	08/09/24	03:17:00	1870.136	72.020	08/09/24	04:38:00	1869.487	72.185
08/09/24	01:57:00	1870.946	71.746	08/09/24	03:18:00	1870.120	72.027	08/09/24	04:39:00	1869.475	72.187
08/09/24	01:58:00	1870.940	71.743	08/09/24	03:19:00	1870.118	72.024	08/09/24	04:40:00	1869.469	72.199
08/09/24	01:59:00	1870.944	71.752	08/09/24	03:20:00	1870.078	72.013	08/09/24	04:41:00	1869.453	72.201
08/09/24	02:00:00	1870.931	71.763	08/09/24	03:21:00	1870.093	72.017	08/09/24	04:42:00	1869.446	72.213
08/09/24	02:01:00	1870.915	71.775	08/09/24	03:22:00	1870.103	72.024	08/09/24	04:43:00	1869.462	72.222
08/09/24	02:02:00	1870.895	71.778	08/09/24	03:23:00	1870.101	72.033	08/09/24	04:44:00	1869.422	72.228
08/09/24	02:03:00	1870.874	71.783	08/09/24	03:24:00	1870.082	72.044	08/09/24	04:45:00	1869.436	72.232
08/09/24	02:04:00	1870.871	71.785	08/09/24	03:25:00	1870.067	72.049	08/09/24	04:46:00	1869.427	72.231
08/09/24	02:05:00	1870.857	71.793	08/09/24	03:26:00	1870.038	72.051	08/09/24	04:47:00	1869.399	72.227
08/09/24	02:06:00	1870.869	71.801	08/09/24	03:27:00	1870.036	72.045	08/09/24	04:48:00	1869.369	72.221
08/09/24	02:07:00	1870.828	71.804	08/09/24	03:28:00	1870.030	72.040	08/09/24	04:49:00	1869.367	72.228
08/09/24	02:08:00	1870.822	71.801	08/09/24	03:29:00	1870.029	72.039	08/09/24	04:50:00	1869.369	72.221
08/09/24	02:09:00	1870.801	71.814	08/09/24	03:30:00	1870.013	72.046	08/09/24	04:51:00	1869.383	72.230
08/09/24	02:10:00	1870.797	71.812	08/09/24	03:31:00	1870.015	72.057	08/09/24	04:52:00	1869.372	72.233
08/09/24	02:11:00	1870.802	71.826	08/09/24	03:32:00	1869.994	72.058	08/09/24	04:53:00	1869.347	72.231

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/09/24	04:54:00	1869.339	72.227	08/09/24	06:15:00	1868.815	72.398	08/09/24	07:36:00	1868.404	72.533
08/09/24	04:55:00	1869.358	72.236	08/09/24	06:16:00	1868.849	72.409	08/09/24	07:37:00	1868.384	72.528
08/09/24	04:56:00	1869.355	72.244	08/09/24	06:17:00	1868.840	72.414	08/09/24	07:38:00	1868.405	72.528
08/09/24	04:57:00	1869.343	72.241	08/09/24	06:18:00	1868.801	72.409	08/09/24	07:39:00	1868.397	72.547
08/09/24	04:58:00	1869.334	72.242	08/09/24	06:19:00	1868.827	72.413	08/09/24	07:40:00	1868.358	72.558
08/09/24	04:59:00	1869.310	72.236	08/09/24	06:20:00	1868.788	72.410	08/09/24	07:41:00	1868.385	72.563
08/09/24	05:00:00	1869.300	72.236	08/09/24	06:21:00	1868.784	72.415	08/09/24	07:42:00	1868.371	72.554
08/09/24	05:01:00	1869.313	72.232	08/09/24	06:22:00	1868.776	72.422	08/09/24	07:43:00	1868.363	72.551
08/09/24	05:02:00	1869.294	72.234	08/09/24	06:23:00	1868.776	72.417	08/09/24	07:44:00	1868.343	72.544
08/09/24	05:03:00	1869.326	72.241	08/09/24	06:24:00	1868.785	72.416	08/09/24	07:45:00	1868.355	72.549
08/09/24	05:04:00	1869.313	72.244	08/09/24	06:25:00	1868.787	72.417	08/09/24	07:46:00	1868.335	72.555
08/09/24	05:05:00	1869.284	72.254	08/09/24	06:26:00	1868.778	72.423	08/09/24	07:47:00	1868.338	72.563
08/09/24	05:06:00	1869.275	72.259	08/09/24	06:27:00	1868.765	72.429	08/09/24	07:48:00	1868.350	72.574
08/09/24	05:07:00	1869.270	72.264	08/09/24	06:28:00	1868.764	72.433	08/09/24	07:49:00	1868.324	72.572
08/09/24	05:08:00	1869.236	72.256	08/09/24	06:29:00	1868.744	72.436	08/09/24	07:50:00	1868.330	72.579
08/09/24	05:09:00	1869.240	72.263	08/09/24	06:30:00	1868.746	72.442	08/09/24	07:51:00	1868.342	72.585
08/09/24	05:10:00	1869.230	72.261	08/09/24	06:31:00	1868.731	72.445	08/09/24	07:52:00	1868.308	72.584
08/09/24	05:11:00	1869.242	72.261	08/09/24	06:32:00	1868.734	72.446	08/09/24	07:53:00	1868.303	72.584
08/09/24	05:12:00	1869.247	72.268	08/09/24	06:33:00	1868.727	72.441	08/09/24	07:54:00	1868.293	72.577
08/09/24	05:13:00	1869.206	72.264	08/09/24	06:34:00	1868.727	72.434	08/09/24	07:55:00	1868.315	72.582
08/09/24	05:14:00	1869.227	72.276	08/09/24	06:35:00	1868.742	72.445	08/09/24	07:56:00	1868.292	72.584
08/09/24	05:15:00	1869.227	72.269	08/09/24	06:36:00	1868.734	72.444	08/09/24	07:57:00	1868.294	72.587
08/09/24	05:16:00	1869.227	72.281	08/09/24	06:37:00	1868.705	72.448	08/09/24	07:58:00	1868.286	72.586
08/09/24	05:17:00	1869.176	72.272	08/09/24	06:38:00	1868.689	72.462	08/09/24	07:59:00	1868.282	72.589
08/09/24	05:18:00	1869.197	72.277	08/09/24	06:39:00	1868.702	72.468	08/09/24	08:00:00	1868.275	72.584
08/09/24	05:19:00	1869.167	72.269	08/09/24	06:40:00	1868.679	72.465	08/09/24	08:01:00	1868.279	72.590
08/09/24	05:20:00	1869.189	72.276	08/09/24	06:41:00	1868.675	72.466	08/09/24	08:02:00	1868.264	72.588
08/09/24	05:21:00	1869.167	72.276	08/09/24	06:42:00	1868.687	72.469	08/09/24	08:03:00	1868.239	72.579
08/09/24	05:22:00	1869.173	72.288	08/09/24	06:43:00	1868.686	72.475	08/09/24	08:04:00	1868.241	72.580
08/09/24	05:23:00	1869.169	72.289	08/09/24	06:44:00	1868.676	72.473	08/09/24	08:05:00	1868.247	72.586
08/09/24	05:24:00	1869.152	72.283	08/09/24	06:45:00	1868.651	72.472	08/09/24	08:06:00	1868.226	72.578
08/09/24	05:25:00	1869.149	72.277	08/09/24	06:46:00	1868.670	72.475	08/09/24	08:07:00	1868.243	72.579
08/09/24	05:26:00	1869.144	72.280	08/09/24	06:47:00	1868.646	72.477	08/09/24	08:08:00	1868.219	72.571
08/09/24	05:27:00	1869.148	72.284	08/09/24	06:48:00	1868.657	72.479	08/09/24	08:09:00	1868.227	72.586
08/09/24	05:28:00	1869.117	72.282	08/09/24	06:49:00	1868.653	72.485	08/09/24	08:10:00	1868.238	72.594
08/09/24	05:29:00	1869.155	72.301	08/09/24	06:50:00	1868.637	72.485	08/09/24	08:11:00	1868.224	72.594
08/09/24	05:30:00	1869.125	72.312	08/09/24	06:51:00	1868.651	72.489	08/09/24	08:12:00	1868.196	72.592
08/09/24	05:31:00	1869.087	72.310	08/09/24	06:52:00	1868.630	72.491	08/09/24	08:13:00	1868.227	72.598
08/09/24	05:32:00	1869.081	72.307	08/09/24	06:53:00	1868.594	72.482	08/09/24	08:14:00	1868.218	72.606
08/09/24	05:33:00	1869.084	72.306	08/09/24	06:54:00	1868.596	72.483	08/09/24	08:15:00	1868.200	72.613
08/09/24	05:34:00	1869.081	72.305	08/09/24	06:55:00	1868.601	72.481	08/09/24	08:16:00	1868.202	72.614
08/09/24	05:35:00	1869.051	72.303	08/09/24	06:56:00	1868.626	72.487	08/09/24	08:17:00	1868.198	72.614
08/09/24	05:36:00	1869.084	72.304	08/09/24	06:57:00	1868.628	72.488	08/09/24	08:18:00	1868.194	72.620
08/09/24	05:37:00	1869.053	72.299	08/09/24	06:58:00	1868.582	72.477	08/09/24	08:19:00	1868.202	72.628
08/09/24	05:38:00	1869.057	72.296	08/09/24	06:59:00	1868.584	72.481	08/09/24	08:20:00	1868.167	72.631
08/09/24	05:39:00	1869.055	72.303	08/09/24	07:00:00	1868.585	72.481	08/09/24	08:21:00	1868.167	72.634
08/09/24	05:40:00	1869.048	72.304	08/09/24	07:01:00	1868.595	72.488	08/09/24	08:22:00	1868.169	72.635
08/09/24	05:41:00	1869.048	72.312	08/09/24	07:02:00	1868.577	72.482	08/09/24	08:23:00	1868.164	72.640
08/09/24	05:42:00	1869.070	72.326	08/09/24	07:03:00	1868.589	72.485	08/09/24	08:24:00	1868.144	72.633
08/09/24	05:43:00	1869.049	72.336	08/09/24	07:04:00	1868.596	72.486	08/09/24	08:25:00	1868.146	72.637
08/09/24	05:44:00	1869.011	72.334	08/09/24	07:05:00	1868.573	72.492	08/09/24	08:26:00	1868.129	72.632
08/09/24	05:45:00	1869.016	72.334	08/09/24	07:06:00	1868.551	72.499	08/09/24	08:27:00	1868.133	72.633
08/09/24	05:46:00	1868.998	72.335	08/09/24	07:07:00	1868.533	72.504	08/09/24	08:28:00	1868.158	72.647
08/09/24	05:47:00	1869.004	72.340	08/09/24	07:08:00	1868.561	72.506	08/09/24	08:29:00	1868.116	72.638
08/09/24	05:48:00	1868.997	72.339	08/09/24	07:09:00	1868.541	72.505	08/09/24	08:30:00	1868.109	72.635
08/09/24	05:49:00	1868.985	72.336	08/09/24	07:10:00	1868.541	72.495	08/09/24	08:31:00	1868.113	72.637
08/09/24	05:50:00	1868.989	72.336	08/09/24	07:11:00	1868.532	72.500	08/09/24	08:32:00	1868.125	72.647
08/09/24	05:51:00	1868.988	72.345	08/09/24	07:12:00	1868.510	72.503	08/09/24	08:33:00	1868.132	72.652
08/09/24	05:52:00	1868.991	72.351	08/09/24	07:13:00	1868.511	72.508	08/09/24	08:34:00	1868.113	72.646
08/09/24	05:53:00	1868.956	72.348	08/09/24	07:14:00	1868.509	72.512	08/09/24	08:35:00	1868.078	72.638
08/09/24	05:54:00	1868.967	72.350	08/09/24	07:15:00	1868.489	72.513	08/09/24	08:36:00	1868.096	72.639
08/09/24	05:55:00	1868.969	72.358	08/09/24	07:16:00	1868.503	72.509	08/09/24	08:37:00	1868.096	72.638
08/09/24	05:56:00	1868.938	72.357	08/09/24	07:17:00	1868.474	72.499	08/09/24	08:38:00	1868.087	72.637
08/09/24	05:57:00	1868.936	72.360	08/09/24	07:18:00	1868.471	72.493	08/09/24	08:39:00	1868.095	72.643
08/09/24	05:58:00	1868.918	72.362	08/09/24	07:19:00	1868.471	72.495	08/09/24	08:40:00	1868.093	72.640
08/09/24	05:59:00	1868.934	72.355	08/09/24	07:20:00	1868.481	72.499	08/09/24	08:41:00	1868.074	72.641
08/09/24	06:00:00	1868.926	72.354	08/09/24	07:21:00	1868.486	72.509	08/09/24	08:42:00	1868.074	72.648
08/09/24	06:01:00	1868.924	72.365	08/09/24	07:22:00	1868.479	72.515	08/09/24	08:43:00	1868.053	72.639
08/09/24	06:02:00	1868.918	72.369	08/09/24	07:23:00	1868.459	72.521	08/09/24	08:44:00	1868.064	72.634
08/09/24	06:03:00	1868.909	72.370	08/09/24	07:24:00	1868.459	72.528	08/09/24	08:45:00	1868.055	72.642
08/09/24	06:04:00	1868.884	72.369	08/09/24	07:25:00	1868.453	72.526	08/09/24	08:46:00	1868.057	72.640
08/09/24	06:05:00	1868.881	72.372	08/09/24	07:26:00	1868.451	72.532	08/09/24	08:47:00	1868.068	72.648
08/09/24	06:06:00	1868.901	72.376	08/09/24	07:27:00	1868.438	72.524	08/09/24	08:48:00	1868.057	72.650
08/09/24	06:07:00	1868.897	72.379	08/09/24	07:28:00	1868.444	72.536	08/09/24	08:49:00	1868.042	72.656
08/09/24	06:08:00	1868.886	72.384	08/09/24	07:29:00	1868.447	72.547	08/09/24	08:50:00	1868.032	72.651
08/09/24	06:09:00	1868.883	72.390	08/09/24	07:30:00	1868.422	72.538	08/09/24	08:51:00	1868.038	72.656
08/09/24	06:10:00	1868.873	72.395	08/09/24	07:31:00	1868.405	72.538	08/09/24	08:52:00	1868.024	72.664
08/09/24	06:11:00	1868.846	72.395	08/09/24	07:32:00	1868.421	72.545	08/09/24	08:53:00	1868.039	72.666
08/09/24	06:12:00	1868.856	72.395	08/09/24	07:33:00	1868.384	72.536	08/09/24	08:54:00	1868.012	72.664
08/09/24	06:13:00	1868.856	72.407	08/09/24	07:34:00	1868.389	72.536	08/09/24	08:55:00	1867.999	72.665
08/09/24	06:14:00	1868.860	72.413	08/09/24	07:35:00	1868.374	72.524	08/09/24	08:56:00	1867.995	72.666

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/09/24	08:57:00	1867.990	72.671	08/09/24	10:18:00	1867.629	72.775	08/09/24	11:39:00	1867.315	72.878
08/09/24	08:58:00	1867.987	72.677	08/09/24	10:19:00	1867.664	72.788	08/09/24	11:40:00	1867.314	72.878
08/09/24	08:59:00	1867.985	72.676	08/09/24	10:20:00	1867.638	72.786	08/09/24	11:41:00	1867.304	72.880
08/09/24	09:00:00	1867.975	72.669	08/09/24	10:21:00	1867.661	72.789	08/09/24	11:42:00	1867.294	72.881
08/09/24	09:01:00	1867.977	72.672	08/09/24	10:22:00	1867.604	72.776	08/09/24	11:43:00	1867.283	72.881
08/09/24	09:02:00	1867.978	72.678	08/09/24	10:23:00	1867.620	72.785	08/09/24	11:44:00	1867.270	72.882
08/09/24	09:03:00	1867.995	72.687	08/09/24	10:24:00	1867.631	72.795	08/09/24	11:45:00	1867.284	72.891
08/09/24	09:04:00	1867.952	72.678	08/09/24	10:25:00	1867.610	72.788	08/09/24	11:46:00	1867.287	72.897
08/09/24	09:05:00	1867.947	72.673	08/09/24	10:26:00	1867.629	72.789	08/09/24	11:47:00	1867.280	72.896
08/09/24	09:06:00	1867.956	72.675	08/09/24	10:27:00	1867.598	72.795	08/09/24	11:48:00	1867.267	72.902
08/09/24	09:07:00	1867.974	72.681	08/09/24	10:28:00	1867.613	72.794	08/09/24	11:49:00	1867.276	72.904
08/09/24	09:08:00	1867.977	72.687	08/09/24	10:29:00	1867.609	72.799	08/09/24	11:50:00	1867.272	72.893
08/09/24	09:09:00	1867.951	72.685	08/09/24	10:30:00	1867.592	72.797	08/09/24	11:51:00	1867.264	72.899
08/09/24	09:10:00	1867.920	72.683	08/09/24	10:31:00	1867.611	72.800	08/09/24	11:52:00	1867.242	72.896
08/09/24	09:11:00	1867.915	72.688	08/09/24	10:32:00	1867.585	72.804	08/09/24	11:53:00	1867.238	72.890
08/09/24	09:12:00	1867.932	72.693	08/09/24	10:33:00	1867.584	72.803	08/09/24	11:54:00	1867.238	72.889
08/09/24	09:13:00	1867.941	72.697	08/09/24	10:34:00	1867.583	72.807	08/09/24	11:55:00	1867.266	72.895
08/09/24	09:14:00	1867.918	72.694	08/09/24	10:35:00	1867.568	72.805	08/09/24	11:56:00	1867.259	72.899
08/09/24	09:15:00	1867.904	72.695	08/09/24	10:36:00	1867.553	72.804	08/09/24	11:57:00	1867.246	72.903
08/09/24	09:16:00	1867.922	72.698	08/09/24	10:37:00	1867.579	72.808	08/09/24	11:58:00	1867.236	72.903
08/09/24	09:17:00	1867.917	72.694	08/09/24	10:38:00	1867.537	72.809	08/09/24	11:59:00	1867.216	72.902
08/09/24	09:18:00	1867.909	72.695	08/09/24	10:39:00	1867.551	72.808	08/09/24	12:00:00	1867.250	72.902
08/09/24	09:19:00	1867.893	72.698	08/09/24	10:40:00	1867.550	72.809	08/09/24	12:01:00	1867.245	72.909
08/09/24	09:20:00	1867.890	72.694	08/09/24	10:41:00	1867.559	72.814	08/09/24	12:02:00	1867.229	72.912
08/09/24	09:21:00	1867.878	72.691	08/09/24	10:42:00	1867.568	72.815	08/09/24	12:03:00	1867.223	72.912
08/09/24	09:22:00	1867.892	72.690	08/09/24	10:43:00	1867.557	72.817	08/09/24	12:04:00	1867.191	72.905
08/09/24	09:23:00	1867.895	72.700	08/09/24	10:44:00	1867.543	72.818	08/09/24	12:05:00	1867.197	72.915
08/09/24	09:24:00	1867.876	72.706	08/09/24	10:45:00	1867.520	72.813	08/09/24	12:06:00	1867.224	72.920
08/09/24	09:25:00	1867.864	72.709	08/09/24	10:46:00	1867.509	72.815	08/09/24	12:07:00	1867.180	72.917
08/09/24	09:26:00	1867.837	72.699	08/09/24	10:47:00	1867.527	72.818	08/09/24	12:08:00	1867.194	72.909
08/09/24	09:27:00	1867.854	72.704	08/09/24	10:48:00	1867.525	72.822	08/09/24	12:09:00	1867.196	72.909
08/09/24	09:28:00	1867.851	72.703	08/09/24	10:49:00	1867.514	72.832	08/09/24	12:10:00	1867.182	72.908
08/09/24	09:29:00	1867.852	72.713	08/09/24	10:50:00	1867.530	72.834	08/09/24	12:11:00	1867.175	72.912
08/09/24	09:30:00	1867.850	72.714	08/09/24	10:51:00	1867.517	72.838	08/09/24	12:12:00	1867.183	72.916
08/09/24	09:31:00	1867.853	72.718	08/09/24	10:52:00	1867.494	72.837	08/09/24	12:13:00	1867.172	72.916
08/09/24	09:32:00	1867.843	72.723	08/09/24	10:53:00	1867.510	72.840	08/09/24	12:14:00	1867.186	72.924
08/09/24	09:33:00	1867.848	72.723	08/09/24	10:54:00	1867.487	72.825	08/09/24	12:15:00	1867.185	72.926
08/09/24	09:34:00	1867.843	72.726	08/09/24	10:55:00	1867.472	72.830	08/09/24	12:16:00	1867.179	72.921
08/09/24	09:35:00	1867.825	72.727	08/09/24	10:56:00	1867.483	72.835	08/09/24	12:17:00	1867.187	72.927
08/09/24	09:36:00	1867.814	72.725	08/09/24	10:57:00	1867.488	72.842	08/09/24	12:18:00	1867.171	72.935
08/09/24	09:37:00	1867.786	72.720	08/09/24	10:58:00	1867.488	72.842	08/09/24	12:19:00	1867.180	72.941
08/09/24	09:38:00	1867.793	72.710	08/09/24	10:59:00	1867.468	72.840	08/09/24	12:20:00	1867.150	72.935
08/09/24	09:39:00	1867.836	72.715	08/09/24	11:00:00	1867.483	72.847	08/09/24	12:21:00	1867.144	72.934
08/09/24	09:40:00	1867.810	72.718	08/09/24	11:01:00	1867.461	72.847	08/09/24	12:22:00	1867.119	72.928
08/09/24	09:41:00	1867.821	72.723	08/09/24	11:02:00	1867.463	72.850	08/09/24	12:23:00	1867.127	72.936
08/09/24	09:42:00	1867.813	72.732	08/09/24	11:03:00	1867.469	72.858	08/09/24	12:24:00	1867.148	72.946
08/09/24	09:43:00	1867.813	72.741	08/09/24	11:04:00	1867.460	72.858	08/09/24	12:25:00	1867.143	72.946
08/09/24	09:44:00	1867.776	72.732	08/09/24	11:05:00	1867.438	72.860	08/09/24	12:26:00	1867.135	72.942
08/09/24	09:45:00	1867.767	72.733	08/09/24	11:06:00	1867.443	72.858	08/09/24	12:27:00	1867.143	72.946
08/09/24	09:46:00	1867.785	72.741	08/09/24	11:07:00	1867.450	72.859	08/09/24	12:28:00	1867.112	72.939
08/09/24	09:47:00	1867.771	72.747	08/09/24	11:08:00	1867.437	72.865	08/09/24	12:29:00	1867.106	72.937
08/09/24	09:48:00	1867.763	72.743	08/09/24	11:09:00	1867.426	72.865	08/09/24	12:30:00	1867.120	72.940
08/09/24	09:49:00	1867.748	72.736	08/09/24	11:10:00	1867.395	72.854	08/09/24	12:31:00	1867.097	72.938
08/09/24	09:50:00	1867.749	72.739	08/09/24	11:11:00	1867.440	72.854	08/09/24	12:32:00	1867.101	72.942
08/09/24	09:51:00	1867.750	72.744	08/09/24	11:12:00	1867.431	72.855	08/09/24	12:33:00	1867.110	72.946
08/09/24	09:52:00	1867.752	72.750	08/09/24	11:13:00	1867.405	72.860	08/09/24	12:34:00	1867.101	72.942
08/09/24	09:53:00	1867.757	72.752	08/09/24	11:14:00	1867.399	72.863	08/09/24	12:35:00	1867.108	72.947
08/09/24	09:54:00	1867.744	72.749	08/09/24	11:15:00	1867.422	72.866	08/09/24	12:36:00	1867.086	72.947
08/09/24	09:55:00	1867.739	72.744	08/09/24	11:16:00	1867.400	72.868	08/09/24	12:37:00	1867.093	72.955
08/09/24	09:56:00	1867.752	72.748	08/09/24	11:17:00	1867.372	72.865	08/09/24	12:38:00	1867.088	72.955
08/09/24	09:57:00	1867.756	72.752	08/09/24	11:18:00	1867.404	72.869	08/09/24	12:39:00	1867.085	72.961
08/09/24	09:58:00	1867.746	72.757	08/09/24	11:19:00	1867.390	72.868	08/09/24	12:40:00	1867.096	72.957
08/09/24	09:59:00	1867.727	72.761	08/09/24	11:20:00	1867.388	72.870	08/09/24	12:41:00	1867.076	72.948
08/09/24	10:00:00	1867.717	72.758	08/09/24	11:21:00	1867.394	72.875	08/09/24	12:42:00	1867.076	72.947
08/09/24	10:01:00	1867.686	72.762	08/09/24	11:22:00	1867.400	72.882	08/09/24	12:43:00	1867.065	72.945
08/09/24	10:02:00	1867.690	72.758	08/09/24	11:23:00	1867.396	72.878	08/09/24	12:44:00	1867.085	72.959
08/09/24	10:03:00	1867.705	72.756	08/09/24	11:24:00	1867.380	72.876	08/09/24	12:45:00	1867.065	72.955
08/09/24	10:04:00	1867.703	72.762	08/09/24	11:25:00	1867.376	72.874	08/09/24	12:46:00	1867.059	72.954
08/09/24	10:05:00	1867.712	72.761	08/09/24	11:26:00	1867.358	72.866	08/09/24	12:47:00	1867.044	72.950
08/09/24	10:06:00	1867.703	72.769	08/09/24	11:27:00	1867.371	72.874	08/09/24	12:48:00	1867.060	72.952
08/09/24	10:07:00	1867.677	72.767	08/09/24	11:28:00	1867.343	72.878	08/09/24	12:49:00	1867.047	72.954
08/09/24	10:08:00	1867.693	72.769	08/09/24	11:29:00	1867.341	72.870	08/09/24	12:50:00	1867.028	72.955
08/09/24	10:09:00	1867.680	72.769	08/09/24	11:30:00	1867.330	72.873	08/09/24	12:51:00	1867.033	72.955
08/09/24	10:10:00	1867.643	72.752	08/09/24	11:31:00	1867.353	72.881	08/09/24	12:52:00	1867.034	72.955
08/09/24	10:11:00	1867.666	72.755	08/09/24	11:32:00	1867.346	72.885	08/09/24	12:53:00	1867.020	72.959
08/09/24	10:12:00	1867.674	72.761	08/09/24	11:33:00	1867.344	72.886	08/09/24	12:54:00	1867.047	72.968
08/09/24	10:13:00	1867.667	72.760	08/09/24	11:34:00	1867.348	72.890	08/09/24	12:55:00	1867.025	72.975
08/09/24	10:14:00	1867.674	72.771	08/09/24	11:35:00	1867.331	72.885	08/09/24	12:56:00	1867.015	72.966
08/09/24	10:15:00	1867.676	72.779	08/09/24	11:36:00	1867.305	72.876	08/09/24	12:57:00	1867.013	72.968
08/09/24	10:16:00	1867.666	72.782	08/09/24	11:37:00	1867.294	72.871	08/09/24	12:58:00	1867.013	72.968
08/09/24	10:17:00	1867.647	72.783	08/09/24	11:38:00	1867.326	72.878	08/09/24	12:59:00	1867.013	72.970

Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F	Date	Time	Pressure psig	Temp °F
08/09/24	13:00:00	1867.021	72.973	08/09/24	14:21:00	1866.728	73.053	08/09/24	15:42:00	1866.448	73.123
08/09/24	13:01:00	1867.016	72.973	08/09/24	14:22:00	1866.705	73.049	08/09/24	15:43:00	1866.441	73.125
08/09/24	13:02:00	1866.999	72.966	08/09/24	14:23:00	1866.688	73.051	08/09/24	15:44:00	1866.445	73.129
08/09/24	13:03:00	1866.992	72.975	08/09/24	14:24:00	1866.707	73.055	08/09/24	15:45:00	1866.418	73.126
08/09/24	13:04:00	1866.996	72.977	08/09/24	14:25:00	1866.696	73.053	08/09/24	15:46:00	1866.411	73.123
08/09/24	13:05:00	1866.960	72.980	08/09/24	14:26:00	1866.716	73.064	08/09/24	15:47:00	1866.400	73.126
08/09/24	13:06:00	1866.979	72.979	08/09/24	14:27:00	1866.692	73.051	08/09/24	15:48:00	1866.401	73.126
08/09/24	13:07:00	1866.967	72.971	08/09/24	14:28:00	1866.689	73.047	08/09/24	15:49:00	1866.411	73.128
08/09/24	13:08:00	1866.976	72.975	08/09/24	14:29:00	1866.686	73.046	08/09/24	15:50:00	1866.406	73.131
08/09/24	13:09:00	1866.965	72.968	08/09/24	14:30:00	1866.701	73.055	08/09/24	15:51:00	1866.401	73.131
08/09/24	13:10:00	1866.965	72.973	08/09/24	14:31:00	1866.693	73.063	08/09/24	15:52:00	1866.381	73.134
08/09/24	13:11:00	1866.958	72.972	08/09/24	14:32:00	1866.680	73.063	08/09/24	15:53:00	1866.382	73.135
08/09/24	13:12:00	1866.954	72.978	08/09/24	14:33:00	1866.667	73.061	08/09/24	15:54:00	1866.381	73.134
08/09/24	13:13:00	1866.970	72.987	08/09/24	14:34:00	1866.658	73.062	08/09/24	15:55:00	1866.403	73.137
08/09/24	13:14:00	1866.964	72.982	08/09/24	14:35:00	1866.669	73.072	08/09/24	15:56:00	1866.376	73.132
08/09/24	13:15:00	1866.936	72.984	08/09/24	14:36:00	1866.667	73.073	08/09/24	15:57:00	1866.360	73.134
08/09/24	13:16:00	1866.944	72.980	08/09/24	14:37:00	1866.672	73.078	08/09/24	15:58:00	1866.361	73.137
08/09/24	13:17:00	1866.938	72.980	08/09/24	14:38:00	1866.655	73.078	08/09/24	15:59:00	1866.359	73.136
08/09/24	13:18:00	1866.946	72.979	08/09/24	14:39:00	1866.651	73.078	08/09/24	16:00:00	1866.352	73.140
08/09/24	13:19:00	1866.930	72.981	08/09/24	14:40:00	1866.659	73.082	08/09/24	16:01:00	1866.374	73.145
08/09/24	13:20:00	1866.930	72.986	08/09/24	14:41:00	1866.641	73.079	08/09/24	16:02:00	1866.352	73.145
08/09/24	13:21:00	1866.939	72.995	08/09/24	14:42:00	1866.642	73.082	08/09/24	16:03:00	1866.363	73.150
08/09/24	13:22:00	1866.918	72.983	08/09/24	14:43:00	1866.653	73.084	08/09/24	16:04:00	1866.332	73.153
08/09/24	13:23:00	1866.905	72.989	08/09/24	14:44:00	1866.635	73.076	08/09/24	16:05:00	1866.328	73.151
08/09/24	13:24:00	1866.929	72.988	08/09/24	14:45:00	1866.640	73.083	08/09/24	16:06:00	1866.323	73.151
08/09/24	13:25:00	1866.915	72.986	08/09/24	14:46:00	1866.629	73.083	08/09/24	16:07:00	1866.327	73.156
08/09/24	13:26:00	1866.901	72.997	08/09/24	14:47:00	1866.627	73.092	08/09/24	16:08:00	1866.321	73.153
08/09/24	13:27:00	1866.906	72.994	08/09/24	14:48:00	1866.617	73.083	08/09/24	16:09:00	1866.334	73.154
08/09/24	13:28:00	1866.908	73.005	08/09/24	14:49:00	1866.607	73.081				
08/09/24	13:29:00	1866.880	73.000	08/09/24	14:50:00	1866.605	73.087				
08/09/24	13:30:00	1866.884	72.999	08/09/24	14:51:00	1866.618	73.090				
08/09/24	13:31:00	1866.883	73.001	08/09/24	14:52:00	1866.605	73.092				
08/09/24	13:32:00	1866.895	73.004	08/09/24	14:53:00	1866.618	73.095				
08/09/24	13:33:00	1866.882	73.006	08/09/24	14:54:00	1866.604	73.094				
08/09/24	13:34:00	1866.891	73.010	08/09/24	14:55:00	1866.579	73.094				
08/09/24	13:35:00	1866.871	73.008	08/09/24	14:56:00	1866.600	73.094				
08/09/24	13:36:00	1866.859	73.007	08/09/24	14:57:00	1866.603	73.093				
08/09/24	13:37:00	1866.884	73.014	08/09/24	14:58:00	1866.570	73.088				
08/09/24	13:38:00	1866.876	73.015	08/09/24	14:59:00	1866.575	73.088				
08/09/24	13:39:00	1866.865	73.013	08/09/24	15:00:00	1866.576	73.091				
08/09/24	13:40:00	1866.844	73.006	08/09/24	15:01:00	1866.597	73.098				
08/09/24	13:41:00	1866.869	73.022	08/09/24	15:02:00	1866.595	73.097				
08/09/24	13:42:00	1866.841	73.021	08/09/24	15:03:00	1866.589	73.101				
08/09/24	13:43:00	1866.860	73.022	08/09/24	15:04:00	1866.556	73.101				
08/09/24	13:44:00	1866.868	73.021	08/09/24	15:05:00	1866.562	73.106				
08/09/24	13:45:00	1866.848	73.019	08/09/24	15:06:00	1866.557	73.109				
08/09/24	13:46:00	1866.860	73.025	08/09/24	15:07:00	1866.564	73.107				
08/09/24	13:47:00	1866.836	73.024	08/09/24	15:08:00	1866.565	73.103				
08/09/24	13:48:00	1866.844	73.027	08/09/24	15:09:00	1866.547	73.100				
08/09/24	13:49:00	1866.838	73.027	08/09/24	15:10:00	1866.551	73.106				
08/09/24	13:50:00	1866.814	73.021	08/09/24	15:11:00	1866.550	73.108				
08/09/24	13:51:00	1866.825	73.026	08/09/24	15:12:00	1866.524	73.106				
08/09/24	13:52:00	1866.821	73.029	08/09/24	15:13:00	1866.552	73.111				
08/09/24	13:53:00	1866.833	73.032	08/09/24	15:14:00	1866.536	73.112				
08/09/24	13:54:00	1866.840	73.033	08/09/24	15:15:00	1866.533	73.110				
08/09/24	13:55:00	1866.821	73.031	08/09/24	15:16:00	1866.542	73.112				
08/09/24	13:56:00	1866.809	73.033	08/09/24	15:17:00	1866.528	73.115				
08/09/24	13:57:00	1866.813	73.030	08/09/24	15:18:00	1866.505	73.110				
08/09/24	13:58:00	1866.794	73.029	08/09/24	15:19:00	1866.511	73.112				
08/09/24	13:59:00	1866.799	73.029	08/09/24	15:20:00	1866.526	73.115				
08/09/24	14:00:00	1866.790	73.030	08/09/24	15:21:00	1866.525	73.114				
08/09/24	14:01:00	1866.801	73.037	08/09/24	15:22:00	1866.511	73.115				
08/09/24	14:02:00	1866.794	73.041	08/09/24	15:23:00	1866.496	73.118				
08/09/24	14:03:00	1866.780	73.037	08/09/24	15:24:00	1866.482	73.116				
08/09/24	14:04:00	1866.780	73.037	08/09/24	15:25:00	1866.509	73.119				
08/09/24	14:05:00	1866.769	73.030	08/09/24	15:26:00	1866.498	73.114				
08/09/24	14:06:00	1866.765	73.026	08/09/24	15:27:00	1866.489	73.110				
08/09/24	14:07:00	1866.771	73.038	08/09/24	15:28:00	1866.505	73.112				
08/09/24	14:08:00	1866.755	73.038	08/09/24	15:29:00	1866.505	73.112				
08/09/24	14:09:00	1866.772	73.043	08/09/24	15:30:00	1866.484	73.108				
08/09/24	14:10:00	1866.728	73.043	08/09/24	15:31:00	1866.502	73.113				
08/09/24	14:11:00	1866.764	73.049	08/09/24	15:32:00	1866.504	73.114				
08/09/24	14:12:00	1866.749	73.048	08/09/24	15:33:00	1866.496	73.115				
08/09/24	14:13:00	1866.745	73.043	08/09/24	15:34:00	1866.460	73.116				
08/09/24	14:14:00	1866.722	73.036	08/09/24	15:35:00	1866.485	73.118				
08/09/24	14:15:00	1866.746	73.039	08/09/24	15:36:00	1866.459	73.118				
08/09/24	14:16:00	1866.750	73.043	08/09/24	15:37:00	1866.474	73.120				
08/09/24	14:17:00	1866.751	73.046	08/09/24	15:38:00	1866.478	73.122				
08/09/24	14:18:00	1866.730	73.051	08/09/24	15:39:00	1866.477	73.126				
08/09/24	14:19:00	1866.720	73.049	08/09/24	15:40:00	1866.457	73.125				
08/09/24	14:20:00	1866.734	73.055	08/09/24	15:41:00	1866.463	73.130				

APPENDIX I

PANSYSTEM© ANALYSIS OF FALLOFF TEST

Well Test Analysis Report

File: Romulus #1-12 PFOT Analysis.panx

Date: 03-September-2024

Report Details :

Company	Republic Energy & Industrial Solutions, LLC
Location	Romulus Facility
Well	1-12
Test	Reservoir Pressure Falloff
Date	August 8-9, 2024
Injection Interval	4121 - 4645 ft RKB
Interval Completion	Open-Hole
Gauge Type	Badger Low Temp
Gauge Serial Number	91933
Gauge Depth	4080 ft RKB
WSP Analyst	JL
WSP Project Number	192128.0156

Table of Contents

Input Data

Reservoir Configuration

Fluid type	Water
Well orientation	Vertical/Slant
Number of wells	1
Number of layers	1

Layer Parameters

Parameter	Layer 1
Formation thickness (ft)	133
Average formation porosity	0.11
Water saturation	0
Gas saturation	0
Formation compressibility (psi-1)	0.0000e+000
Total system compressibility (psi-1)	6.2000e-006
Layer pressure (psia)	0
Temperature (deg F)	0

Well Parameters

Parameter	Well 1
Well radius (ft)	0.3646
Distance from observation to active well (ft)	0
Wellbore storage coefficient (bbl/psi)	0
Storage Amplitude (psi)	0
Storage Time Constant (hr)	0
Second Wellbore Storage (bbl/psi)	0
Time Change for Second Storage (hr)	0
Well offset - x direction (ft)	0
Well offset - y direction (ft)	0

Fluid Parameters

Parameter	Layer 1
Oil gravity (API)	0
Gas gravity (sp grav)	0
Gas-oil ratio (produced) (scf/STB)	0
Water cut	0
Water salinity (ppm)	0
Check Pressure (psia)	0
Check Temperature (deg F)	0
Gas-oil ratio (solution) (scf/STB)	0
Bubble-point pressure (psia)	0
Oil density (lb/ft3)	0
Oil viscosity (cp)	0
Oil formation volume factor (RB/STB)	0
Gas density (lb/ft3)	0
Gas viscosity (cp)	0
Gas formation volume factor (ft3/scf)	0
Water density (lb/ft3)	0
Water viscosity (cp)	0.8
Water formation volume factor (RB/STB)	1
Oil compressibility (psi-1)	0.0000e+000
Initial Gas compressibility (psi-1)	0.0000e+000
Water compressibility (psi-1)	0.0000e+000

Correlations

Correlation Parameters	Layer 1
Cf Correlation	Hall Correlation
Young's modulus (E) (psi)	0
Poisson's Ratio (v)	0

Layer Boundaries

Boundary Parameter	Layer 1
Boundary Type	Infinitely acting

Rate Change Data

DateTime (hh:mm:ss)	Pressure (psia)	Rate (STB/day)
8/8/2024 9:08:39 AM	0	0
8/8/2024 9:15:00 AM	0	-1473.83
8/8/2024 9:30:00 AM	0	-1516.98
8/8/2024 9:45:00 AM	0	-1465.03
8/8/2024 10:00:00 AM	0	-1502.3
8/8/2024 10:15:00 AM	0	-1475.01
8/8/2024 10:30:00 AM	0	-1477.06
8/8/2024 10:45:00 AM	0	-1453.58
8/8/2024 11:00:00 AM	0	-1484.99
8/8/2024 11:15:00 AM	0	-1481.46
8/8/2024 11:30:00 AM	0	-1467.96
8/8/2024 11:45:00 AM	0	-1475.89
8/8/2024 12:00:00 PM	0	-1464.44
8/8/2024 12:15:00 PM	0	-1444.19
8/8/2024 12:30:00 PM	0	-1444.48
8/8/2024 12:45:00 PM	0	-1451.82
8/8/2024 1:00:00 PM	0	-1461.8
8/8/2024 1:15:00 PM	0	-1447.71
8/8/2024 1:30:00 PM	0	-1500.54
8/8/2024 1:45:00 PM	0	-1491.74
8/8/2024 2:00:00 PM	0	-1475.3
8/8/2024 2:15:00 PM	0	-1447.42
8/8/2024 2:30:00 PM	0	-1465.03
8/8/2024 2:45:00 PM	0	-1467.67
8/8/2024 3:00:00 PM	0	-1451.52
8/8/2024 3:15:00 PM	0	-1454.17
8/8/2024 3:30:00 PM	0	-1458.28
8/8/2024 3:45:00 PM	0	-1501.72
8/8/2024 4:00:00 PM	0	-1471.78
8/8/2024 4:15:00 PM	0	-1485.57
8/8/2024 4:30:00 PM	0	-1457.98
8/8/2024 4:45:00 PM	0	-1457.98
8/8/2024 5:00:00 PM	0	-1438.02
8/8/2024 5:15:00 PM	0	-1491.74
8/8/2024 5:30:00 PM	0	-1457.69
8/8/2024 5:45:00 PM	0	-1475.3
8/8/2024 6:00:00 PM	0	-1448
8/8/2024 6:15:00 PM	0	-1471.78
8/8/2024 6:30:00 PM	0	-1464.44
8/8/2024 6:45:00 PM	0	-1482.05

DateTime (hh:mm:ss)	Pressure (psia)	Rate (STB/day)
8/8/2024 7:00:00 PM	0	-1492.03
8/8/2024 7:15:00 PM	0	-1451.23
8/8/2024 7:30:00 PM	0	-1482.34
8/8/2024 7:45:00 PM	0	-1454.75
8/8/2024 8:15:30 PM	2131.752	-1509.94
8/9/2024 4:10:48 PM	1880.94	0

Model Data

Layer 1 Model Data

Model Parameter	Model Data
Model Name	Model 1
Model Type	Radial homogeneous
Permeability (md)	0
Skin factor	0

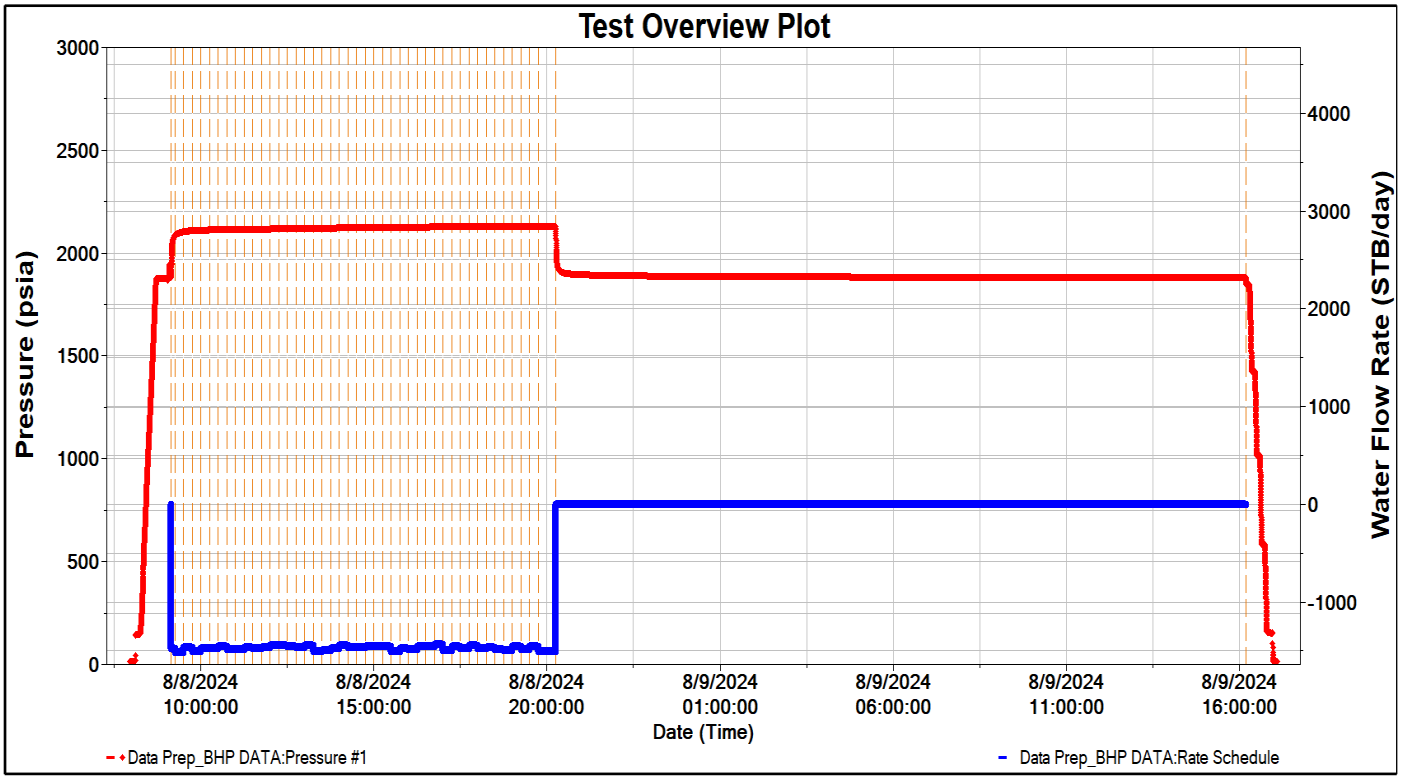
Analysis

Model - Layer 1 : Model 1

Model Detail

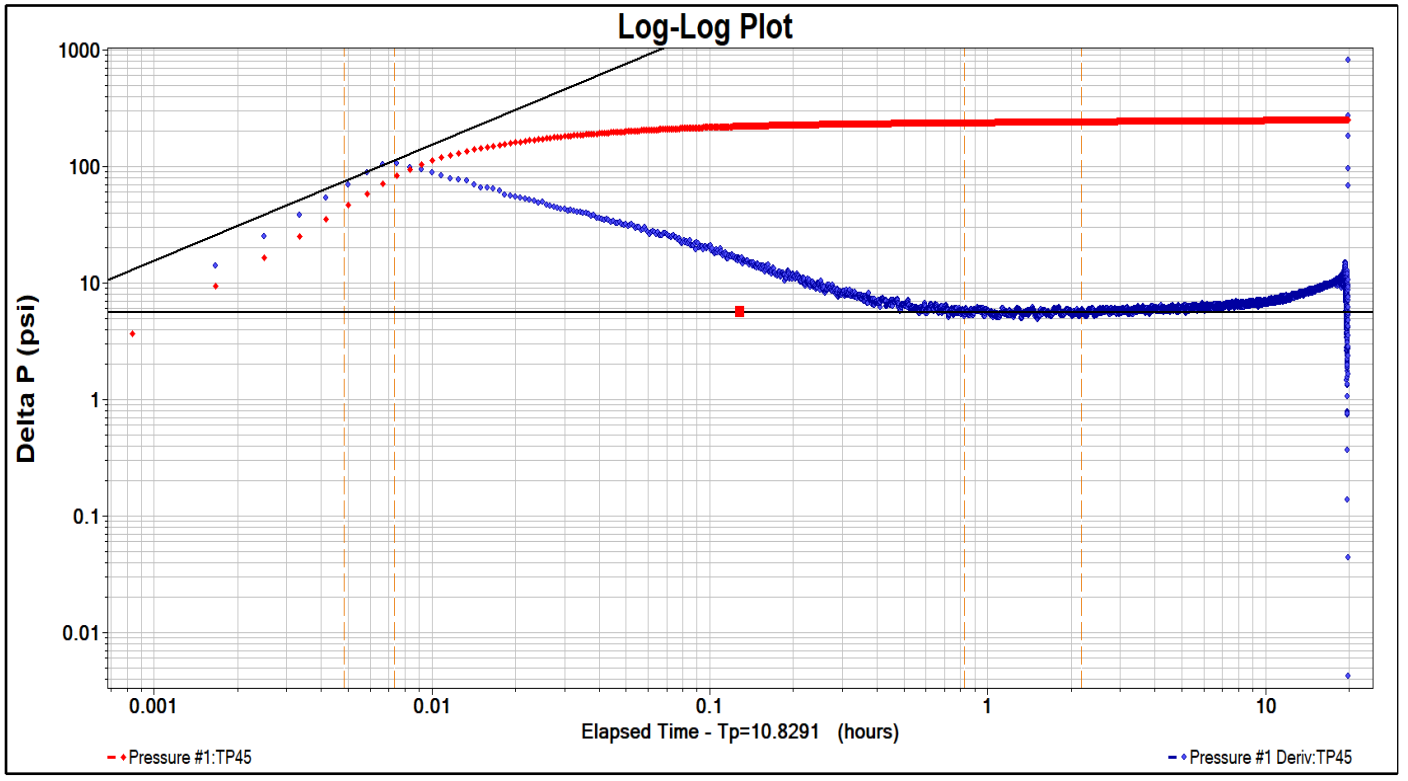
Model Parameter	Model Data
Model Name	Model 1
Model Type	Radial homogeneous
Layer	Layer 1
WellBore Storage Model	Classic Wellbore Storage

Test Overview Plot



Test Overview Plot

Log-Log Plot:TP45



Log-Log Plot

Line Results

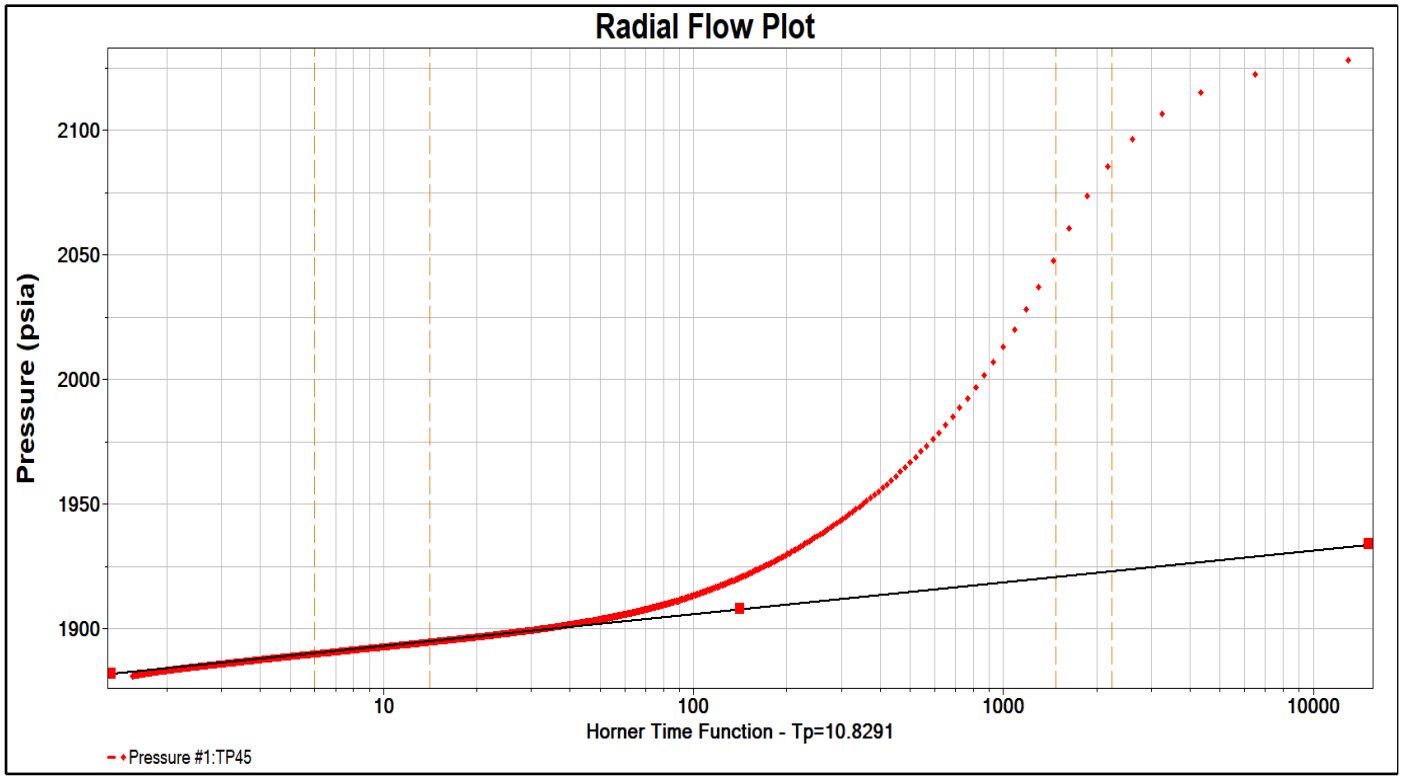
Line Result Parameter	Value
Wellbore storage coefficient (bbl/psi)	0.00416424
Permeability (md)	116.589
Permeability-thickness (md.ft)	15506.3
Skin factor	14.7449

Line Details

Details	Value
Line type	Wellbore storage
Slope	1
Intercept	15108.14
Coefficient of Determination	Not Used

Details	Value
Line type	Radial flow
Slope	0
Intercept	5.5
Coefficient of Determination	Not Used

Radial Flow Plot:TP45



Radial Flow Plot

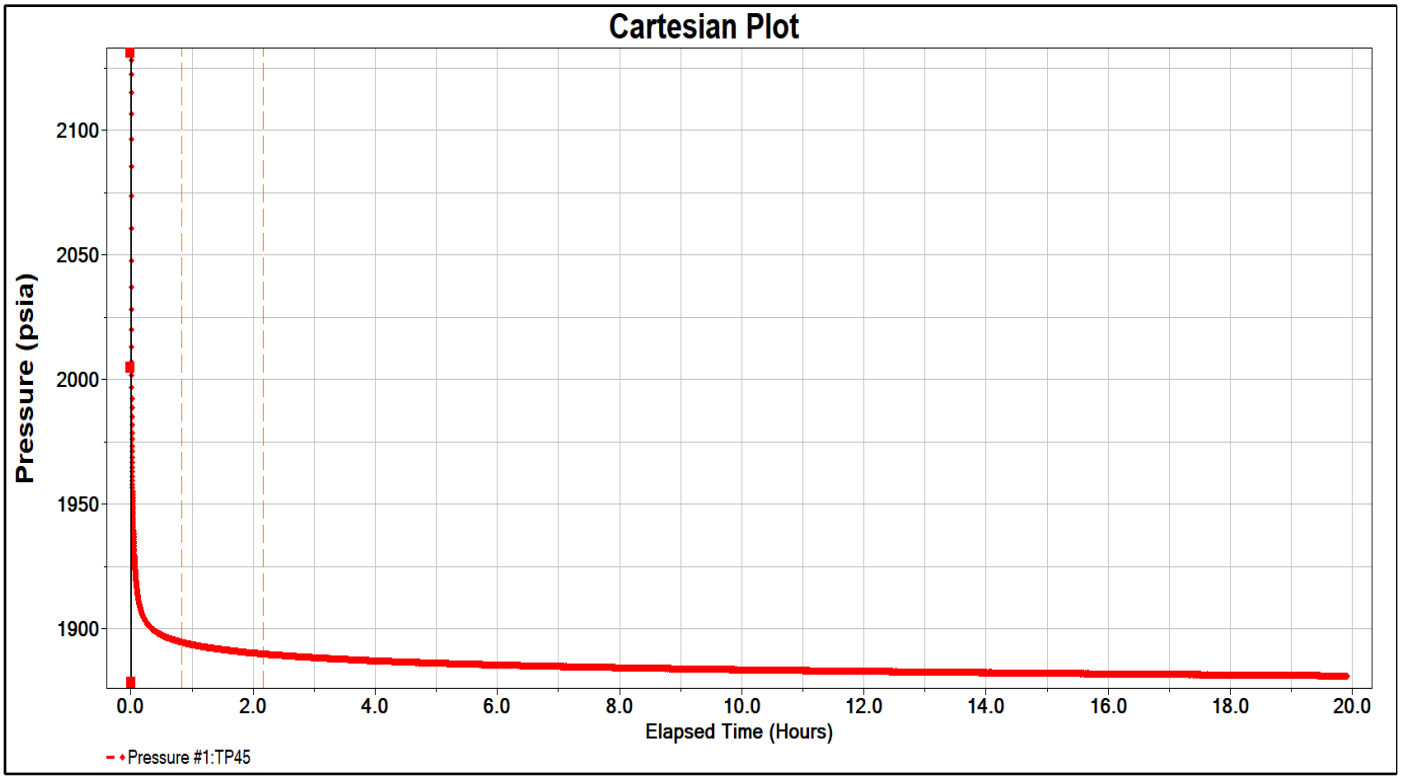
Line Results

Line Result Parameter	Value
Permeability (md)	115.754
Permeability-thickness (md.ft)	15395.3
Extrapolated pressure (psia)	1879.954
Radius of investigation (ft)	1885.31
Flow efficiency	0.3551
dP skin (constant rate) (psi)	162.384
Skin factor	14.6571

Line Details

Details	Value
Line type	Radial flow
Slope	12.755
Intercept	1879.954
Coefficient of Determination	1
Extrapolated pressure (psia)	1879.954
Pressure at dt = 1 hour (psia)	1893.64

Cartesian Plot:TP45



Cartesian Plot

Line Results

Line Result Parameter	Value
Wellbore storage coefficient (bbl/psi)	0.00421619

Line Details

Details	Value
Line type	Wellbore storage
Slope	-14922
Intercept	2160.317
Coefficient of Determination	1

APPENDIX J

PRESSURE TEST REPORT DATA

Pressure Test Report

COMPANY INFORMATION

Company Name	Republic Services
Representative	Jeffry Tahtouh with WSP USA, Inc.
Phone	713-503-7704
Fax	
Address	Republic Services 28470 Citrin Drive Romulus, MI 48174
E-Mail Address	
Service Company	Impact Completions, LLC

WELL INFORMATION

Well Name	Romulus Facility 1-12
Well Location	Romulus, MI
Field and Pool	
Status (Oil, Gas, Water, Injection)	
Perforated Intervals	
Mid-point of Perforated Intervals (MPP)	
Drilling Rig Number	
Elevations	
Kelly Bushing (KB)	13 feet above ground level
Casing Flange (CF)	
KB-CF	
Ground Level	
Plug Back Total Depth	
Total Depth	
Production Casing	
Production Tubing	

TEST INFORMATION

Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024
Dead-weight Gauge Tubing Pressure	
Dead-weight Gauge Casing Pressure	
Shut-in Date (Duration)	August 08, 2024 at 20:15:30
Date / Time on Bottom	August 08, 2024 at 08:43:00
Date / Time off Bottom	August 09, 2024 at 16:10:45
Probe Serial Number	91933
Probe Offset from End of Tool String	
Run Depth at Probe Pressure Port	

PRESSURE TEST RESULTS

Maximum Recorded Probe Pressure	2117.1 psig
Maximum Recorded Probe Temperature	84.7 deg F
Final Buildup Pressure	
Gradient Survey Information	
Extrapolated Pressure to MPP	
Final Gradient at Depth	
Job Number	

Company Name	Republic Services
Well Name	Romulus Facility 1-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024

PROBE INFORMATION

Probe Serial Number	91933
Model	Badger Low Temp
Pressure	
Calibrated Pressure Range	0.00 - 10,000.00
Accuracy	2.4000 psi (0.024 %FS)
Resolution	0.0300 psi (0.0003 %FS)
Temperature	
Calibrated Temperature Range	0.00 - 150.0 deg C
Accuracy	0.40 deg C (0.40 %FS)
Resolution	0.001 deg C (0.001%FS)
Calibration File Used for Reports	October 04, 2023

PROGRAMMING DETAILS

Step	Sample Mode	Period	Duration	Comment

Program Start Time	
Program End Time	
Total Samples Taken	
Usage for this Test	
Generic Data File Name	

COMMENTS

Reported By Tim Auker

Zeroed bottom gauge in reference to Kelly Bushing Measurements.

Top Gauge: 91932 (two feet above bottom gauge)
Bottom Gauge: 91933

The bottom gauge was used for this report.

R.I.H. with tandem electronic memory gauges. Hang bottom gauge at 4080 feet. Record data for injection/fall-off test. P.O.O.H. making gradient stops.

Company Name	Republic Services
Well Name	Romulus Facility 1-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024

Pressure vs. Depth

Probe Serial Number 91933

		(ft)	(psig)	(psi/ft)	(deg F)	(deg F/ft)
16:05	16:10	4080.000	1866.359	-	73.155	-
16:12	16:17	4000.000	1831.885	0.4309	78.175	-0.0628
16:22	16:27	3000.000	1409.456	0.4224	72.783	0.0054
16:30	16:35	2000.000	999.652	0.4098	63.016	0.0098
16:39	16:44	1000.000	570.719	0.4289	59.054	0.0040
16:48	16:53	13.000	142.850	0.4335	72.792	-0.0139

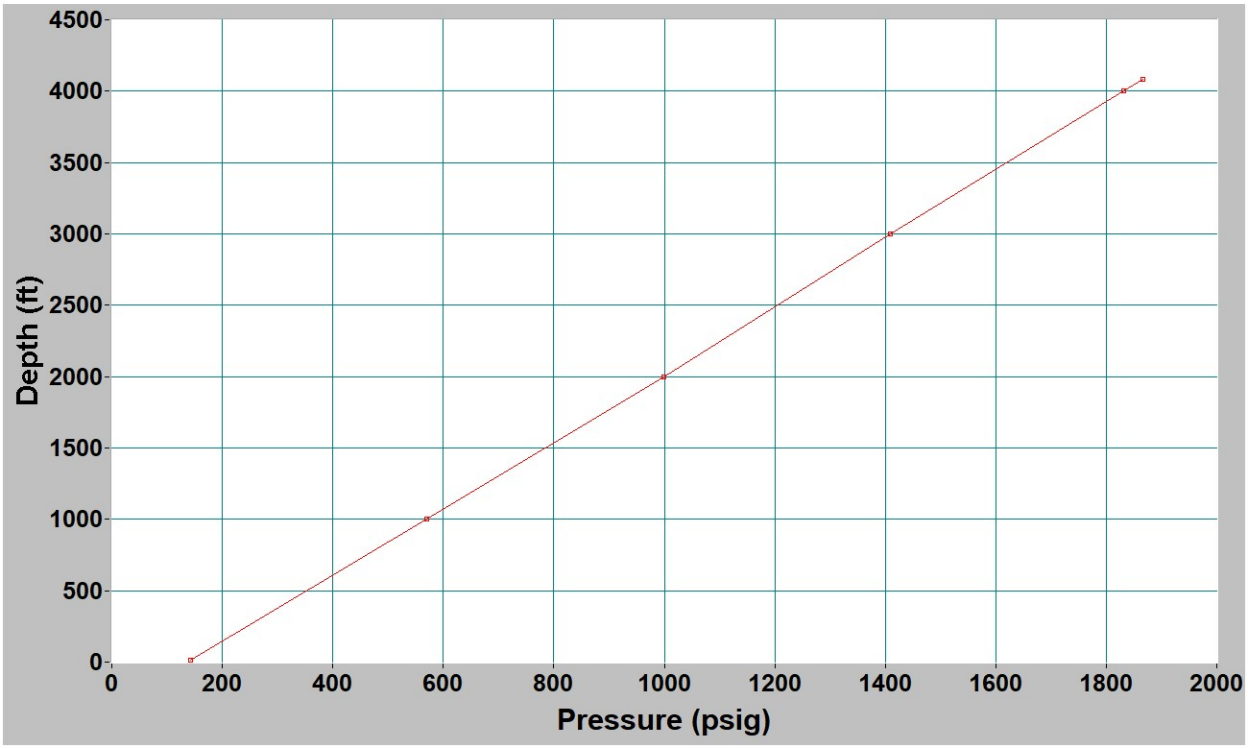
Extrapolated to MPP:

(ft)	(psig)	(deg F)
0.000		

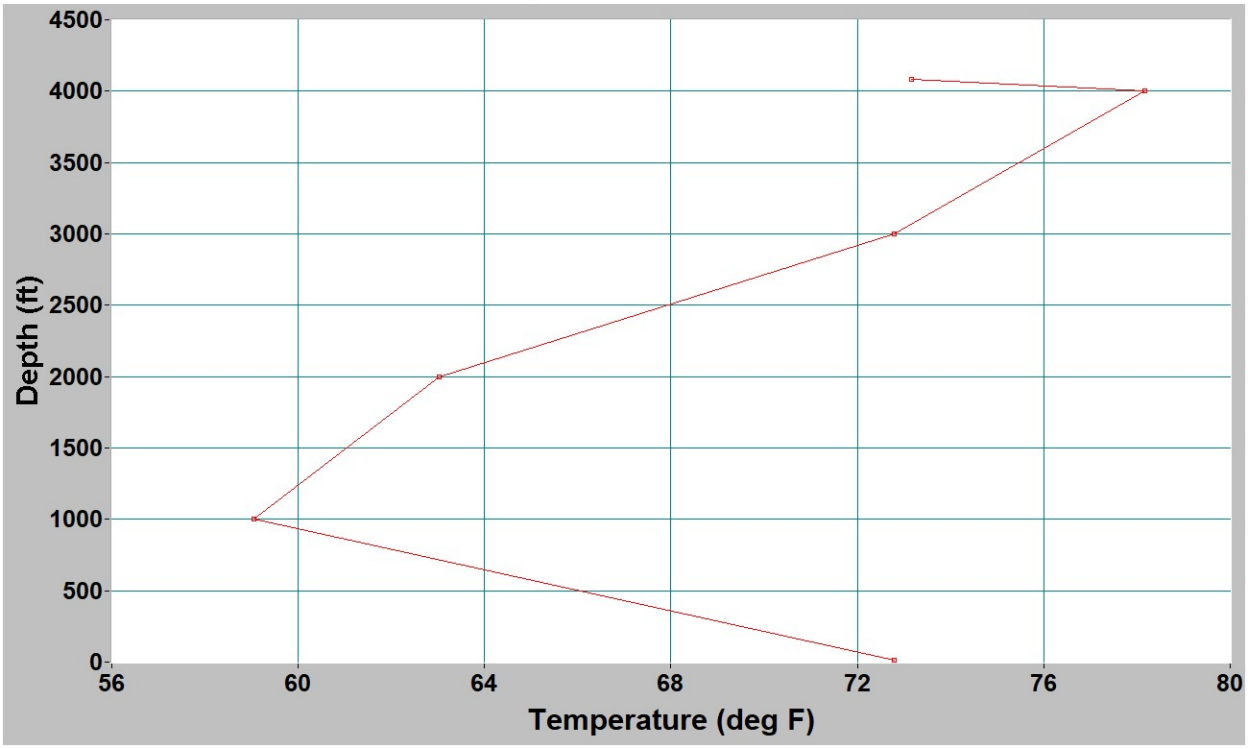
Company Name	Republic Services
Well Name	Romulus Facility 1-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024

Probe Serial Number 91933

Static Pressure Gradients

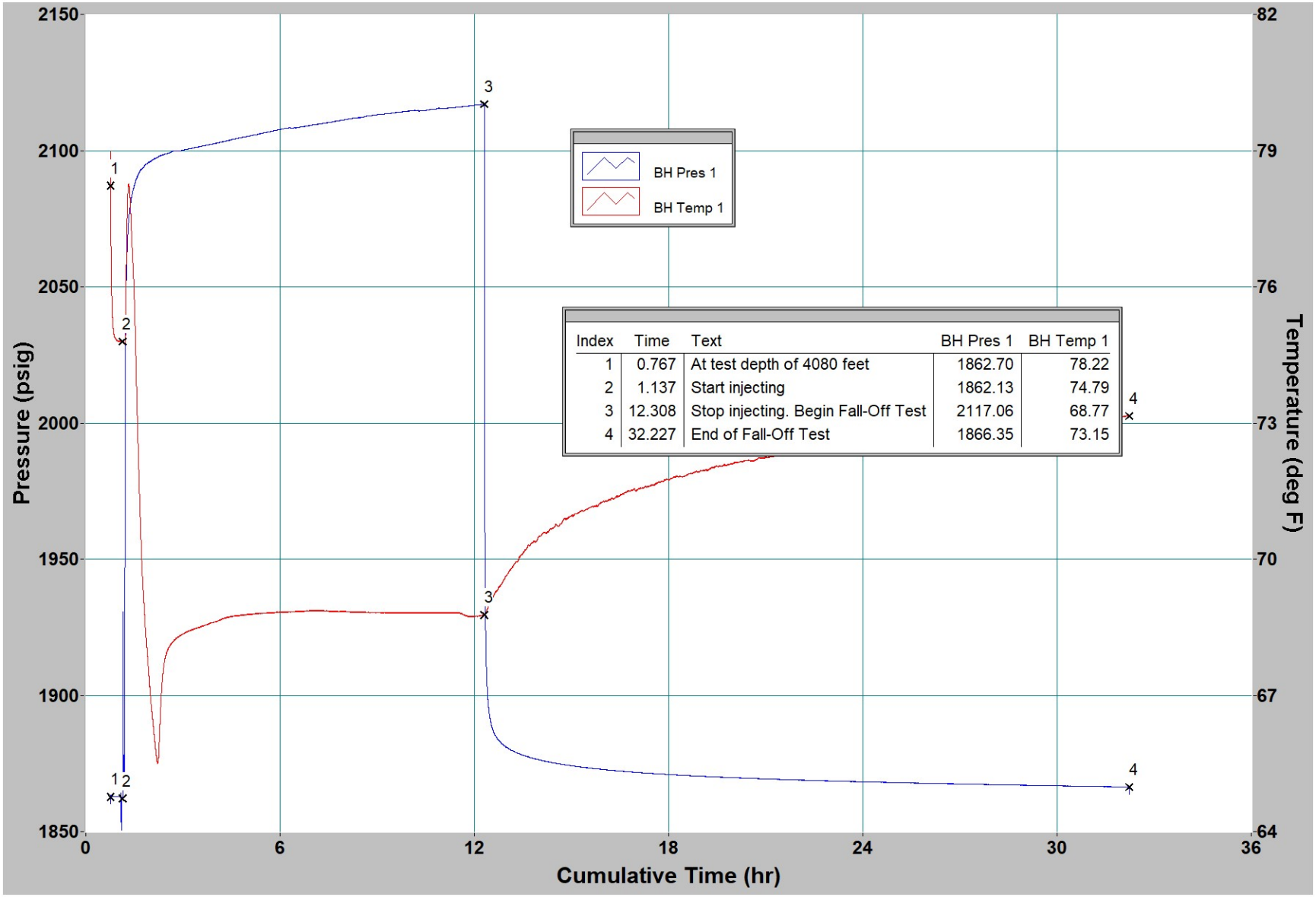


Static Temperature Gradients



Company Name	Republic Services
Well Name	Romulus Facility 1-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024

Fall-Off Test



Index	Time	Text	BH Pres 1	BH Temp 1
1	0.767	At test depth of 4080 feet	1862.70	78.22
2	1.137	Start injecting	1862.13	74.79
3	12.308	Stop injecting. Begin Fall-Off Test	2117.06	68.77
4	32.227	End of Fall-Off Test	1866.35	73.15

Company Name Republic Services
Well Name Romulus Facility 1-12
Type of Test Injection/Fall-Off
Date(s) of Test August 08, 2024 thru August 09, 2024

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
Gauges on surface				
2024/08/08	07:57:00	0.0000	0.023	67.366
2024/08/08	08:03:24	0.1067	-0.002	68.326
Begin equalizing lubricator				
2024/08/08	08:06:27	0.1575	-0.571	68.362
2024/08/08	08:09:24	0.2067	131.165	68.128
R.I.H. with gauges				
2024/08/08	08:14:06	0.2850	132.699	68.128
2024/08/08	08:15:24	0.3067	141.588	68.207
2024/08/08	08:21:24	0.4067	513.135	60.298
2024/08/08	08:27:24	0.5067	916.125	60.874
2024/08/08	08:33:24	0.6067	1272.069	66.718
2024/08/08	08:39:24	0.7067	1647.301	76.280
At test depth of 4080 feet				
2024/08/08	08:43:00	0.7667	1862.701	78.224
2024/08/08	08:45:24	0.8067	1863.135	75.623
2024/08/08	08:51:24	0.9067	1862.881	74.865
2024/08/08	08:57:24	1.0067	1862.872	74.804
2024/08/08	09:03:24	1.1067	1861.510	74.795
Start injecting				
2024/08/08	09:05:15	1.1375	1862.134	74.793
2024/08/08	09:09:24	1.2067	1943.033	74.739
2024/08/08	09:15:24	1.3067	2071.132	78.175
2024/08/08	09:21:24	1.4067	2082.420	77.274
2024/08/08	09:27:24	1.5067	2087.588	75.569
2024/08/08	09:33:24	1.6067	2090.790	72.712
2024/08/08	09:39:24	1.7067	2093.024	70.347
2024/08/08	09:45:24	1.8067	2094.250	68.866
2024/08/08	09:51:24	1.9067	2095.268	67.856
2024/08/08	09:57:24	2.0067	2096.074	66.898
2024/08/08	10:03:24	2.1067	2096.971	66.153
2024/08/08	10:09:24	2.2067	2097.420	65.514
2024/08/08	10:15:24	2.3067	2098.157	66.652
2024/08/08	10:21:24	2.4067	2098.497	67.640
2024/08/08	10:27:24	2.5067	2098.869	67.955
2024/08/08	10:33:24	2.6067	2099.306	68.104
2024/08/08	10:39:24	2.7067	2099.779	68.193
2024/08/08	10:45:24	2.8067	2099.952	68.263
2024/08/08	10:51:24	2.9067	2099.926	68.311
2024/08/08	10:57:24	3.0067	2100.177	68.360
2024/08/08	11:03:24	3.1067	2100.410	68.392
2024/08/08	11:09:24	3.2067	2100.649	68.423
2024/08/08	11:15:24	3.3067	2100.908	68.450
2024/08/08	11:21:24	3.4067	2101.151	68.472
2024/08/08	11:27:24	3.5067	2101.384	68.500
2024/08/08	11:33:24	3.6067	2101.651	68.527
2024/08/08	11:39:24	3.7067	2101.904	68.553
2024/08/08	11:45:24	3.8067	2102.131	68.581
2024/08/08	11:51:24	3.9067	2102.365	68.601
2024/08/08	11:57:24	4.0067	2102.612	68.619

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2024/08/08	12:03:24	4.1067	2102.896	68.646
2024/08/08	12:09:24	4.2067	2103.137	68.675
2024/08/08	12:15:24	4.3067	2103.413	68.704
2024/08/08	12:21:24	4.4067	2103.697	68.725
2024/08/08	12:27:24	4.5067	2104.011	68.742
2024/08/08	12:33:24	4.6067	2104.250	68.752
2024/08/08	12:39:24	4.7067	2104.533	68.760
2024/08/08	12:45:24	4.8067	2104.781	68.763
2024/08/08	12:51:24	4.9067	2104.990	68.774
2024/08/08	12:57:24	5.0067	2105.212	68.781
2024/08/08	13:03:24	5.1067	2105.486	68.790
2024/08/08	13:09:24	5.2067	2105.728	68.792
2024/08/08	13:15:24	5.3067	2105.934	68.801
2024/08/08	13:21:24	5.4067	2106.265	68.812
2024/08/08	13:27:24	5.5067	2106.498	68.805
2024/08/08	13:33:24	5.6067	2106.746	68.819
2024/08/08	13:39:24	5.7067	2106.992	68.819
2024/08/08	13:45:24	5.8067	2107.289	68.824
2024/08/08	13:51:24	5.9067	2107.515	68.826
2024/08/08	13:57:24	6.0067	2107.735	68.833
2024/08/08	14:03:24	6.1067	2107.995	68.832
2024/08/08	14:09:24	6.2067	2108.176	68.837
2024/08/08	14:15:24	6.3067	2108.378	68.841
2024/08/08	14:21:24	6.4067	2108.255	68.842
2024/08/08	14:27:24	6.5067	2108.344	68.853
2024/08/08	14:33:24	6.6067	2108.552	68.851
2024/08/08	14:39:24	6.7067	2108.758	68.853
2024/08/08	14:45:24	6.8067	2108.938	68.857
2024/08/08	14:51:24	6.9067	2109.159	68.864
2024/08/08	14:57:24	7.0067	2109.401	68.868
2024/08/08	15:03:24	7.1067	2109.603	68.862
2024/08/08	15:09:24	7.2067	2109.704	68.866
2024/08/08	15:15:24	7.3067	2109.911	68.868
2024/08/08	15:21:24	7.4067	2110.077	68.860
2024/08/08	15:27:24	7.5067	2110.269	68.851
2024/08/08	15:33:24	7.6067	2110.469	68.853
2024/08/08	15:39:24	7.7067	2110.721	68.851
2024/08/08	15:45:24	7.8067	2110.924	68.844
2024/08/08	15:51:24	7.9067	2111.106	68.848
2024/08/08	15:57:24	8.0067	2111.365	68.841
2024/08/08	16:03:24	8.1067	2111.608	68.844
2024/08/08	16:09:24	8.2067	2111.735	68.839
2024/08/08	16:15:24	8.3067	2111.861	68.837
2024/08/08	16:21:24	8.4067	2112.011	68.832
2024/08/08	16:27:24	8.5067	2112.122	68.830
2024/08/08	16:33:24	8.6067	2112.338	68.832
2024/08/08	16:39:24	8.7067	2112.660	68.824
2024/08/08	16:45:24	8.8067	2112.737	68.823
2024/08/08	16:51:24	8.9067	2112.990	68.833
2024/08/08	16:57:24	9.0067	2113.172	68.830

Company Name	Republic Services
Well Name	Romulus Facility 1-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2024/08/08	17:03:24	9.1067	2113.274	68.817
2024/08/08	17:09:24	9.2067	2113.356	68.821
2024/08/08	17:15:24	9.3067	2113.520	68.817
2024/08/08	17:21:24	9.4067	2113.645	68.824
2024/08/08	17:27:24	9.5067	2113.817	68.817
2024/08/08	17:33:24	9.6067	2113.999	68.819
2024/08/08	17:39:24	9.7067	2114.113	68.821
2024/08/08	17:45:24	9.8067	2114.217	68.815
2024/08/08	17:51:24	9.9067	2114.378	68.819
2024/08/08	17:57:24	10.0067	2114.548	68.821
2024/08/08	18:03:24	10.1067	2114.652	68.810
2024/08/08	18:09:24	10.2067	2114.547	68.821
2024/08/08	18:15:24	10.3067	2114.473	68.819
2024/08/08	18:21:24	10.4067	2114.590	68.812
2024/08/08	18:27:24	10.5067	2114.754	68.828
2024/08/08	18:33:24	10.6067	2114.981	68.819
2024/08/08	18:39:24	10.7067	2115.093	68.815
2024/08/08	18:45:24	10.8067	2115.164	68.823
2024/08/08	18:51:24	10.9067	2115.593	68.824
2024/08/08	18:57:24	11.0067	2115.334	68.817
2024/08/08	19:03:24	11.1067	2115.440	68.819
2024/08/08	19:09:24	11.2067	2115.590	68.821
2024/08/08	19:15:24	11.3067	2115.699	68.823
2024/08/08	19:21:24	11.4067	2115.791	68.817
2024/08/08	19:27:24	11.5067	2115.920	68.815
2024/08/08	19:33:24	11.6067	2116.045	68.797
2024/08/08	19:39:24	11.7067	2116.166	68.761
2024/08/08	19:45:24	11.8067	2116.303	68.740
2024/08/08	19:51:24	11.9067	2116.449	68.736
2024/08/08	19:57:24	12.0067	2116.637	68.742
2024/08/08	20:03:24	12.1067	2116.757	68.743
2024/08/08	20:09:24	12.2067	2116.903	68.767
2024/08/08	20:15:24	12.3067	2117.066	68.774
Stop injecting. Begin Fall-Off Test				
2024/08/08	20:15:30	12.3083	2117.059	68.772
2024/08/08	20:21:24	12.4067	1900.700	68.898
2024/08/08	20:27:24	12.5067	1890.144	69.053
2024/08/08	20:33:24	12.6067	1886.282	69.210
2024/08/08	20:39:24	12.7067	1884.244	69.309
2024/08/08	20:45:24	12.8067	1882.776	69.415
2024/08/08	20:51:24	12.9067	1881.707	69.532
2024/08/08	20:57:24	13.0067	1880.783	69.640
2024/08/08	21:03:24	13.1067	1880.111	69.764
2024/08/08	21:09:24	13.2067	1879.495	69.854
2024/08/08	21:15:24	13.3067	1878.912	69.940
2024/08/08	21:21:24	13.4067	1878.474	70.059
2024/08/08	21:27:24	13.5067	1878.040	70.137
2024/08/08	21:33:24	13.6067	1877.651	70.232
2024/08/08	21:39:24	13.7067	1877.225	70.297
2024/08/08	21:45:24	13.8067	1876.923	70.363

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2024/08/08	21:51:24	13.9067	1876.623	70.385
2024/08/08	21:57:24	14.0067	1876.326	70.502
2024/08/08	22:03:24	14.1067	1876.074	70.558
2024/08/08	22:09:24	14.2067	1875.766	70.574
2024/08/08	22:15:24	14.3067	1875.579	70.617
2024/08/08	22:21:24	14.4067	1875.310	70.680
2024/08/08	22:27:24	14.5067	1875.157	70.754
2024/08/08	22:33:24	14.6067	1874.883	70.729
2024/08/08	22:39:24	14.7067	1874.730	70.801
2024/08/08	22:45:24	14.8067	1874.520	70.896
2024/08/08	22:51:24	14.9067	1874.332	70.918
2024/08/08	22:57:24	15.0067	1874.173	70.965
2024/08/08	23:03:24	15.1067	1874.025	70.997
2024/08/08	23:09:24	15.2067	1873.862	71.024
2024/08/08	23:15:24	15.3067	1873.691	71.062
2024/08/08	23:21:24	15.4067	1873.540	71.071
2024/08/08	23:27:24	15.5067	1873.401	71.105
2024/08/08	23:33:24	15.6067	1873.254	71.148
2024/08/08	23:39:24	15.7067	1873.142	71.168
2024/08/08	23:45:24	15.8067	1872.977	71.164
2024/08/08	23:51:24	15.9067	1872.912	71.251
2024/08/08	23:57:24	16.0067	1872.733	71.267
2024/08/09	00:03:24	16.1067	1872.645	71.287
2024/08/09	00:09:24	16.2067	1872.521	71.316
2024/08/09	00:15:24	16.3067	1872.408	71.323
2024/08/09	00:21:24	16.4067	1872.317	71.388
2024/08/09	00:27:24	16.5067	1872.235	71.409
2024/08/09	00:33:24	16.6067	1872.107	71.436
2024/08/09	00:39:24	16.7067	1872.022	71.483
2024/08/09	00:45:24	16.8067	1871.907	71.492
2024/08/09	00:51:24	16.9067	1871.820	71.532
2024/08/09	00:57:24	17.0067	1871.758	71.521
2024/08/09	01:03:24	17.1067	1871.637	71.551
2024/08/09	01:09:24	17.2067	1871.563	71.564
2024/08/09	01:15:24	17.3067	1871.465	71.591
2024/08/09	01:21:24	17.4067	1871.415	71.611
2024/08/09	01:27:24	17.5067	1871.327	71.640
2024/08/09	01:33:24	17.6067	1871.273	71.661
2024/08/09	01:39:24	17.7067	1871.163	71.703
2024/08/09	01:45:24	17.8067	1871.073	71.713
2024/08/09	01:51:24	17.9067	1871.012	71.751
2024/08/09	01:57:24	18.0067	1870.935	71.744
2024/08/09	02:03:24	18.1067	1870.892	71.784
2024/08/09	02:09:24	18.2067	1870.797	71.812
2024/08/09	02:15:24	18.3067	1870.728	71.814
2024/08/09	02:21:24	18.4067	1870.660	71.811
2024/08/09	02:27:24	18.5067	1870.623	71.829
2024/08/09	02:33:24	18.6067	1870.529	71.866
2024/08/09	02:39:24	18.7067	1870.488	71.881
2024/08/09	02:45:24	18.8067	1870.417	71.911

Company Name	Republic Services
Well Name	Romulus Facility 1-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2024/08/09	02:51:24	18.9067	1870.366	71.920
2024/08/09	02:57:24	19.0067	1870.328	71.946
2024/08/09	03:03:24	19.1067	1870.256	71.955
2024/08/09	03:09:24	19.2067	1870.207	71.947
2024/08/09	03:15:24	19.3067	1870.182	72.010
2024/08/09	03:21:24	19.4067	1870.095	72.025
2024/08/09	03:27:24	19.5067	1870.030	72.039
2024/08/09	03:33:24	19.6067	1869.978	72.048
2024/08/09	03:39:24	19.7067	1869.948	72.070
2024/08/09	03:45:24	19.8067	1869.876	72.070
2024/08/09	03:51:24	19.9067	1869.828	72.097
2024/08/09	03:57:24	20.0067	1869.794	72.113
2024/08/09	04:03:24	20.1067	1869.732	72.126
2024/08/09	04:09:24	20.2067	1869.677	72.142
2024/08/09	04:15:24	20.3067	1869.654	72.153
2024/08/09	04:21:24	20.4067	1869.598	72.172
2024/08/09	04:27:24	20.5067	1869.537	72.174
2024/08/09	04:33:24	20.6067	1869.507	72.165
2024/08/09	04:39:24	20.7067	1869.469	72.189
2024/08/09	04:45:24	20.8067	1869.426	72.230
2024/08/09	04:51:24	20.9067	1869.379	72.234
2024/08/09	04:57:24	21.0067	1869.339	72.246
2024/08/09	05:03:24	21.1067	1869.307	72.235
2024/08/09	05:09:24	21.2067	1869.252	72.261
2024/08/09	05:15:24	21.3067	1869.206	72.270
2024/08/09	05:21:24	21.4067	1869.182	72.282
2024/08/09	05:27:24	21.5067	1869.114	72.284
2024/08/09	05:33:24	21.6067	1869.074	72.302
2024/08/09	05:39:24	21.7067	1869.042	72.304
2024/08/09	05:45:24	21.8067	1868.988	72.329
2024/08/09	05:51:24	21.9067	1869.000	72.351
2024/08/09	05:57:24	22.0067	1868.937	72.356
2024/08/09	06:03:24	22.1067	1868.890	72.369
2024/08/09	06:09:24	22.2067	1868.871	72.392
2024/08/09	06:15:24	22.3067	1868.841	72.405
2024/08/09	06:21:24	22.4067	1868.767	72.415
2024/08/09	06:27:24	22.5067	1868.772	72.428
2024/08/09	06:33:24	22.6067	1868.700	72.433
2024/08/09	06:39:24	22.7067	1868.698	72.469
2024/08/09	06:45:24	22.8067	1868.670	72.473
2024/08/09	06:51:24	22.9067	1868.631	72.489
2024/08/09	06:57:24	23.0067	1868.595	72.478
2024/08/09	07:03:24	23.1067	1868.579	72.480
2024/08/09	07:09:24	23.2067	1868.545	72.500
2024/08/09	07:15:24	23.3067	1868.484	72.511
2024/08/09	07:21:24	23.4067	1868.467	72.507
2024/08/09	07:27:24	23.5067	1868.425	72.523
2024/08/09	07:33:24	23.6067	1868.388	72.536
2024/08/09	07:39:24	23.7067	1868.383	72.552
2024/08/09	07:45:24	23.8067	1868.339	72.547

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2024/08/09	07:51:24	23.9067	1868.343	72.585
2024/08/09	07:57:24	24.0067	1868.276	72.586
2024/08/09	08:03:24	24.1067	1868.248	72.579
2024/08/09	08:09:24	24.2067	1868.228	72.595
2024/08/09	08:15:24	24.3067	1868.202	72.612
2024/08/09	08:21:24	24.4067	1868.189	72.637
2024/08/09	08:27:24	24.5067	1868.142	72.635
2024/08/09	08:33:24	24.6067	1868.143	72.649
2024/08/09	08:39:24	24.7067	1868.074	72.633
2024/08/09	08:45:24	24.8067	1868.051	72.640
2024/08/09	08:51:24	24.9067	1868.020	72.655
2024/08/09	08:57:24	25.0067	1867.972	72.673
2024/08/09	09:03:24	25.1067	1867.965	72.685
2024/08/09	09:09:24	25.2067	1867.946	72.687
2024/08/09	09:15:24	25.3067	1867.915	72.698
2024/08/09	09:21:24	25.4067	1867.896	72.689
2024/08/09	09:27:24	25.5067	1867.867	72.707
2024/08/09	09:33:24	25.6067	1867.829	72.721
2024/08/09	09:39:24	25.7067	1867.820	72.716
2024/08/09	09:45:24	25.8067	1867.788	72.734
2024/08/09	09:51:24	25.9067	1867.755	72.747
2024/08/09	09:57:24	26.0067	1867.745	72.752
2024/08/09	10:03:24	26.1067	1867.705	72.757
2024/08/09	10:09:24	26.2067	1867.685	72.768
2024/08/09	10:15:24	26.3067	1867.666	72.779
2024/08/09	10:21:24	26.4067	1867.633	72.788
2024/08/09	10:27:24	26.5067	1867.622	72.801
2024/08/09	10:33:24	26.6067	1867.579	72.808
2024/08/09	10:39:24	26.7067	1867.559	72.808
2024/08/09	10:45:24	26.8067	1867.536	72.820
2024/08/09	10:51:24	26.9067	1867.509	72.838
2024/08/09	10:57:24	27.0067	1867.474	72.840
2024/08/09	11:03:24	27.1067	1867.458	72.855
2024/08/09	11:09:24	27.2067	1867.418	72.862
2024/08/09	11:15:24	27.3067	1867.421	72.873
2024/08/09	11:21:24	27.4067	1867.392	72.876
2024/08/09	11:27:24	27.5067	1867.360	72.876
2024/08/09	11:33:24	27.6067	1867.332	72.885
2024/08/09	11:39:24	27.7067	1867.322	72.882
2024/08/09	11:45:24	27.8067	1867.295	72.896
2024/08/09	11:51:24	27.9067	1867.268	72.900
2024/08/09	11:57:24	28.0067	1867.246	72.905
2024/08/09	12:03:24	28.1067	1867.196	72.909
2024/08/09	12:09:24	28.2067	1867.189	72.909
2024/08/09	12:15:24	28.3067	1867.170	72.921
2024/08/09	12:21:24	28.4067	1867.136	72.934
2024/08/09	12:27:24	28.5067	1867.118	72.941
2024/08/09	12:33:24	28.6067	1867.103	72.945
2024/08/09	12:39:24	28.7067	1867.079	72.954
2024/08/09	12:45:24	28.8067	1867.045	72.955

Company Name	Republic Services
Well Name	Romulus Facility 1-12
Type of Test	Injection/Fall-Off
Date(s) of Test	August 08, 2024 thru August 09, 2024

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2024/08/09	12:51:24	28.9067	1867.031	72.952
2024/08/09	12:57:24	29.0067	1867.022	72.964
2024/08/09	13:03:24	29.1067	1866.996	72.977
2024/08/09	13:09:24	29.2067	1866.959	72.972
2024/08/09	13:15:24	29.3067	1866.935	72.984
2024/08/09	13:21:24	29.4067	1866.927	72.990
2024/08/09	13:27:24	29.5067	1866.901	72.999
2024/08/09	13:33:24	29.6067	1866.876	73.000
2024/08/09	13:39:24	29.7067	1866.878	73.013
2024/08/09	13:45:24	29.8067	1866.854	73.024
2024/08/09	13:51:24	29.9067	1866.815	73.024
2024/08/09	13:57:24	30.0067	1866.787	73.026
2024/08/09	14:03:24	30.1067	1866.773	73.036
2024/08/09	14:09:24	30.2067	1866.750	73.044
2024/08/09	14:15:24	30.3067	1866.750	73.036
2024/08/09	14:21:24	30.4067	1866.710	73.053
2024/08/09	14:27:24	30.5067	1866.702	73.058
2024/08/09	14:33:24	30.6067	1866.654	73.060
2024/08/09	14:39:24	30.7067	1866.640	73.081
2024/08/09	14:45:24	30.8067	1866.639	73.083
2024/08/09	14:51:24	30.9067	1866.595	73.092
2024/08/09	14:57:24	31.0067	1866.578	73.089
2024/08/09	15:03:24	31.1067	1866.579	73.101
2024/08/09	15:09:24	31.2067	1866.562	73.107
2024/08/09	15:15:24	31.3067	1866.529	73.110
2024/08/09	15:21:24	31.4067	1866.525	73.112
2024/08/09	15:27:24	31.5067	1866.496	73.110
2024/08/09	15:33:24	31.6067	1866.484	73.123
2024/08/09	15:39:24	31.7067	1866.472	73.132
2024/08/09	15:45:24	31.8067	1866.414	73.123
2024/08/09	15:51:24	31.9067	1866.382	73.132
2024/08/09	15:57:24	32.0067	1866.360	73.139
2024/08/09	16:03:24	32.1067	1866.342	73.146
2024/08/09	16:09:24	32.2067	1866.344	73.153
End of Fall-Off Test				
2024/08/09	16:10:39	32.2275	1866.347	73.153
POOH Gradient: 4080.000 ft				
2024/08/09	16:10:42	32.2283	1866.359	73.155
P.O.O.H. making gradient stops				
2024/08/09	16:10:45	32.2292	1866.347	73.150
Stop at 4000 feet				
2024/08/09	16:12:18	32.2550	1831.226	75.492
2024/08/09	16:15:24	32.3067	1831.880	77.857
POOH Gradient: 4000.000 ft				
2024/08/09	16:17:00	32.3333	1831.885	78.175
2024/08/09	16:21:24	32.4067	1420.819	75.018
Stop at 3000 feet				
2024/08/09	16:21:51	32.4142	1409.759	74.282
POOH Gradient: 3000.000 ft				
2024/08/09	16:26:39	32.4942	1409.456	72.783
2024/08/09	16:27:24	32.5067	1342.463	72.280
Stop at 2000 feet				
2024/08/09	16:30:36	32.5600	999.999	64.324
2024/08/09	16:33:24	32.6067	999.690	63.189
POOH Gradient: 2000.000 ft				
2024/08/09	16:35:27	32.6408	999.652	63.016
Stop at 1000 feet				
2024/08/09	16:38:51	32.6975	570.818	59.954
2024/08/09	16:39:24	32.7067	570.727	59.587
POOH Gradient: 1000.000 ft				
2024/08/09	16:43:48	32.7800	570.719	59.054
2024/08/09	16:45:24	32.8067	401.378	58.559
Stop at 13 feet				
2024/08/09	16:47:48	32.8467	142.738	59.144
2024/08/09	16:51:24	32.9067	142.866	71.404
POOH Gradient: 13.000 ft				
2024/08/09	16:53:12	32.9367	142.850	72.792
2024/08/09	16:57:24	33.0067	142.668	82.063
Bleed-Off Lubricator				
2024/08/09	16:57:36	33.0100	142.707	82.240
2024/08/09	17:03:24	33.1067	0.059	84.565

APPENDIX K

EPA PRESSURE FALLOFF TEST FORM

BACKGROUND INFORMATION FOR ANALYSIS OF PRESSURE FALL-OFF TEST

FACILITY NAME		OPERATOR	
Republic Industrial and Energy Solutions, LLC		Republic Industrial and Energy Solutions, LLC	
WELL NAME		USEPA PERMIT NUMBER	STATE PERMIT NUMBER
#1-12		MI-163-1W-C0010	M-452
TEST START DATE	TEST END DATE	Depth Reference:	
August 8, 2024	August 9, 2024	Kelly Bushing ☐ ☑	Ground Level ☐ ☐

GEOLOGICAL DATA

POROSITY, decimal	NET PERMEABLE THICKNESS, ft.	VISCOSITY, cp.	COMPRESSIBILITY, per psi
0.11	133	1.34	6.20E-006

WELL AND OPERATION DATA

LONGSTRING CASING DIAMETER, ins	FINAL PRETEST FLOW RATE, gpm	INJECTATE TEMPERATURE, deg.F	KB ELEVATION, ft
7	44.04	68.77	626.6
OPEN HOLE DIAMTER, ins	PRETEST FLOW TIME, hrs. **SEE BELOW**	SPECIFIC GRAVITY OF TEST FLUID	TEST DEPTH FOR COMPARISON, ft
8.75	11.11	1	
GAUGE DEPTH, ft		CUMULATIVE VOLUME INJECTED SINCE LAST PRESSURE EQUALIZATION,	
4080		09/09/23 - 08/09/24 10,247,681	

TEST DATA

GAUGE CALIBRATION DATE			
October 4,2023			
FLOW RATE, gpm	PRESSURE AT BEGINNING OF FALL-OFF, p	PRESSURE AT END OF FALL-OFF, ps	TO SUPPORT FULL COLUMN, psi
44.04	2131.75	1881.04	
TEST LENGTH, hrs.	INITIAL GRADIENT, psi/ft.	FINAL GRADIENT, psi/ft.	FINAL FLUID LEVEL, ft.
19.92		0.432	0

REMEMBER

"Pre-test flow time" is the time since the reservoir was last in equilibrium. This may be the time since the well was last shut-in but only if the well was shut-in long enough for the pressure in the reservoir to approach equilibrium pressure.

1. Please fill in the above cells.
2. Injection of normal injectate at normal rate is preferred.
3. Submit an up-to-date well schematic.
4. The well should be shut-in as quickly as possible.
5. Data should be collected at the maximum rate for at least the first five minutes; between five and thirty minutes at no less than one reading every 30 seconds. After thirty minutes, the operator can reduce frequency as required.
6. The pressure gauge should have been calibrated no more than a year prior to the test. Submit a copy of the calibration certificate for the gauge used for pressure measurements with your report.
7. The report on the test must explain any anomalies shown in the results.
8. Submit digital logging data on a CD in .las or .asc format.

APPENDIX L

STATIC PRESSURE GRADIENT SURVEY (ABRIDGED)

Static Pressure Gradient Survey Data

Well Name: Well 1-12
Operating Company: Republic Industrial and Energy Solutions, LLC
Well Location: Romulus, MI
Wireline Company: Impact Completions, LLC
Downhole Data Recorder: MRO 2 Serial No. 91933

Job Number: 192128.0156
WSP Rep.: Jeffry Tahtouh
Data Start: 8/9/24 16:09:00
Data End: 8/9/24 16:52:00
Data Interval (secs): 15

Date/Time	Pressure, psig	Temperature, °F	Date/Time	Pressure, psig	Temperature, °F	Date/Time	Pressure, psig	Temperature, °F
8/9/24 16:09:00	1866.334	73.154	8/9/24 16:25:15	1409.528	72.916	8/9/24 16:41:30	570.714	59.186
8/9/24 16:09:15	1866.333	73.154	8/9/24 16:25:30	1409.494	72.890	8/9/24 16:41:45	570.726	59.170
8/9/24 16:09:30	1866.335	73.155	8/9/24 16:25:45	1409.493	72.863	8/9/24 16:42:00	570.735	59.150
8/9/24 16:09:45	1866.328	73.151	8/9/24 16:26:00	1409.478	72.842	8/9/24 16:42:15	570.729	59.132
8/9/24 16:10:00	1866.336	73.155	8/9/24 16:26:15	1409.465	72.821	8/9/24 16:42:30	570.736	59.117
8/9/24 16:10:15	1866.337	73.156	8/9/24 16:26:30	1409.449	72.795	8/9/24 16:42:45	570.733	59.102
8/9/24 16:10:30	1866.354	73.156	8/9/24 16:26:45	1406.335	72.773	8/9/24 16:43:00	570.741	59.089
8/9/24 16:10:45	1866.347	73.150	8/9/24 16:27:00	1383.642	72.714	8/9/24 16:43:15	570.722	59.076
8/9/24 16:11:00	1862.519	73.147	8/9/24 16:27:15	1358.386	72.497	8/9/24 16:43:30	570.714	59.063
8/9/24 16:11:15	1860.096	73.184	8/9/24 16:27:30	1331.612	72.106	8/9/24 16:43:45	570.729	59.060
8/9/24 16:11:30	1848.030	73.335	8/9/24 16:27:45	1304.295	71.574	8/9/24 16:44:00	552.663	59.036
8/9/24 16:11:45	1836.003	73.752	8/9/24 16:28:00	1276.014	70.935	8/9/24 16:44:15	526.917	58.972
8/9/24 16:12:00	1831.616	74.553	8/9/24 16:28:15	1247.881	70.253	8/9/24 16:44:30	500.646	58.926
8/9/24 16:12:15	1831.366	75.352	8/9/24 16:28:30	1219.588	69.585	8/9/24 16:44:45	474.039	58.916
8/9/24 16:12:30	1831.058	75.948	8/9/24 16:28:45	1190.653	68.944	8/9/24 16:45:00	446.495	58.798
8/9/24 16:12:45	1831.204	76.356	8/9/24 16:29:00	1161.068	68.283	8/9/24 16:45:15	418.481	58.671
8/9/24 16:13:00	1831.283	76.652	8/9/24 16:29:15	1130.321	67.600	8/9/24 16:45:30	389.661	58.471
8/9/24 16:13:15	1831.250	76.872	8/9/24 16:29:30	1099.927	66.923	8/9/24 16:45:45	360.438	58.268
8/9/24 16:13:30	1831.406	77.062	8/9/24 16:29:45	1068.927	66.241	8/9/24 16:46:00	330.462	58.005
8/9/24 16:13:45	1831.389	77.213	8/9/24 16:30:00	1037.604	65.559	8/9/24 16:46:15	300.110	57.734
8/9/24 16:14:00	1831.516	77.347	8/9/24 16:30:15	1010.517	64.973	8/9/24 16:46:30	268.831	57.627
8/9/24 16:14:15	1831.574	77.471	8/9/24 16:30:30	1000.114	64.485	8/9/24 16:46:45	237.111	57.542
8/9/24 16:14:30	1831.656	77.565	8/9/24 16:30:45	1000.004	64.125	8/9/24 16:47:00	204.377	57.486
8/9/24 16:14:45	1831.642	77.657	8/9/24 16:31:00	1000.012	63.881	8/9/24 16:47:15	177.619	57.600
8/9/24 16:15:00	1831.775	77.735	8/9/24 16:31:15	999.891	63.717	8/9/24 16:47:30	156.342	58.083
8/9/24 16:15:15	1831.814	77.815	8/9/24 16:31:30	999.844	63.596	8/9/24 16:47:45	144.041	58.905
8/9/24 16:15:30	1831.745	77.880	8/9/24 16:31:45	999.867	63.505	8/9/24 16:48:00	142.826	60.585
8/9/24 16:15:45	1831.855	77.946	8/9/24 16:32:00	999.813	63.426	8/9/24 16:48:15	142.873	62.431
8/9/24 16:16:00	1831.823	78.003	8/9/24 16:32:15	999.788	63.371	8/9/24 16:48:30	142.844	63.842
8/9/24 16:16:15	1831.895	78.048	8/9/24 16:32:30	999.751	63.316	8/9/24 16:48:45	142.858	65.061
8/9/24 16:16:30	1831.815	78.093	8/9/24 16:32:45	999.726	63.276	8/9/24 16:49:00	142.905	66.121
8/9/24 16:16:45	1831.888	78.141	8/9/24 16:33:00	999.710	63.239	8/9/24 16:49:15	142.925	67.041
8/9/24 16:17:00	1831.885	78.175	8/9/24 16:33:15	999.694	63.206	8/9/24 16:49:30	142.886	67.829
8/9/24 16:17:15	1820.052	78.220	8/9/24 16:33:30	999.685	63.175	8/9/24 16:49:45	142.930	68.512
8/9/24 16:17:30	1813.265	78.325	8/9/24 16:33:45	999.675	63.148	8/9/24 16:50:00	142.934	69.103
8/9/24 16:17:45	1792.620	78.441	8/9/24 16:34:00	999.678	63.127	8/9/24 16:50:15	142.896	69.636
8/9/24 16:18:00	1771.437	78.553	8/9/24 16:34:15	999.676	63.106	8/9/24 16:50:30	142.889	70.108
8/9/24 16:18:15	1747.672	78.580	8/9/24 16:34:30	999.658	63.077	8/9/24 16:50:45	142.883	70.528
8/9/24 16:18:30	1722.234	78.629	8/9/24 16:34:45	999.667	63.066	8/9/24 16:51:00	142.846	70.903
8/9/24 16:18:45	1697.178	78.641	8/9/24 16:35:00	999.657	63.048	8/9/24 16:51:15	142.863	71.224
8/9/24 16:19:00	1672.033	78.549	8/9/24 16:35:15	999.668	63.030	8/9/24 16:51:30	142.871	71.511
8/9/24 16:19:15	1646.170	78.341	8/9/24 16:35:30	998.436	63.013	8/9/24 16:51:45	142.866	71.765
8/9/24 16:19:30	1620.629	78.075	8/9/24 16:35:45	973.242	62.984	8/9/24 16:52:00	142.863	71.997
8/9/24 16:19:45	1594.047	77.706	8/9/24 16:36:00	946.386	62.910			
8/9/24 16:20:00	1565.226	77.267	8/9/24 16:36:15	917.601	62.851			
8/9/24 16:20:15	1537.083	76.811	8/9/24 16:36:30	885.300	62.698			
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8/9/24 16:21:15	1430.127	75.252	8/9/24 16:37:30	733.271	61.765			
8/9/24 16:21:30	1416.720	74.867	8/9/24 16:37:45	692.350	61.497			
8/9/24 16:21:45	1409.832	74.446	8/9/24 16:38:00	651.003	61.163			
8/9/24 16:22:00	1409.780	74.066	8/9/24 16:38:15	609.559	60.771			
8/9/24 16:22:15	1409.778	73.803	8/9/24 16:38:30	578.489	60.392			
8/9/24 16:22:30	1409.777	73.611	8/9/24 16:38:45	571.073	60.069			
8/9/24 16:22:45	1409.722	73.469	8/9/24 16:39:00	570.794	59.820			
8/9/24 16:23:00	1409.702	73.366	8/9/24 16:39:15	570.718	59.658			
8/9/24 16:23:15	1409.655	73.283	8/9/24 16:39:30	570.714	59.546			
8/9/24 16:23:30	1409.643	73.208	8/9/24 16:39:45	570.739	59.465			
8/9/24 16:23:45	1409.585	73.158	8/9/24 16:40:00	570.721	59.399			
8/9/24 16:24:00	1409.554	73.107	8/9/24 16:40:15	570.716	59.357			
8/9/24 16:24:15	1409.545	73.063	8/9/24 16:40:30	570.734	59.307			
8/9/24 16:24:30	1409.518	73.021	8/9/24 16:40:45	570.728	59.271			
8/9/24 16:24:45	1409.512	72.981	8/9/24 16:41:00	570.714	59.247			
8/9/24 16:25:00	1409.486	72.950	8/9/24 16:41:15	570.718	59.210			

EXHIBITS

michigan wireline services

NUCLEAR TRACER LOG

Company	REPUBLIC SERVICES
Well	EDS #1-12
Field	ROMULUS STORAGE
County	WAYNE
State	MICHIGAN

Location: API 21-163-M452

1670' FSL & 2372' FEL

SEC 12 TWP 3S RGE 9E

Other Services

Permanent Datum	GROUND LEVEL	Elevation	626'
Log Measured From	KELLY BUSHING		
Drilling Measured From	KELLY BUSHING		

Elevation

K.B. 639'
D.F. 638'
G.L. 626'

Date	08/06/2024
Run Number	ONE
Depth Driller	4645'
Depth Logger	4460'
Bottom Logged Interval	4460'
Top Log Interval	3000'
Packer Depth	
Type Fluid	WATER
Fluid Level	N/A
Max. Recorded Temp.	N/A
Estimated Cement Top	N/A
Time Well Ready	2:00 AM
Time Logger on Bottom	2:36 PM
Equipment Number	#117
Location	MT. PLEASANT
Recorded By	J.PIFER
Witnessed By	JEFFRY TAHTOUH

Tubing Liner Record			
SIZE	Weight	From	To
4 1/2"	F.G	SURFACE	4041'

Casing Record			
SIZE	Weight	From	To
20"	94#	SURFACE	119'
13 3/8"	48#	SURFACE	396'
9 5/8"	36#	SURFACE	824'
7"	26#	SURFACE	4080'

<<< Fold Here >>>

Comments

THIS LOG IS CORRELATED TO MICHIGAN WIRELINE
NUCLEAR TRACER LOG DATED
09/05/2023

2" COLLAR
BOWEN
4 SECOND EJECTION.

THANK YOU FOR USING MICHIGAN WIRELINE

BASE PASS

michigan wireline services

Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
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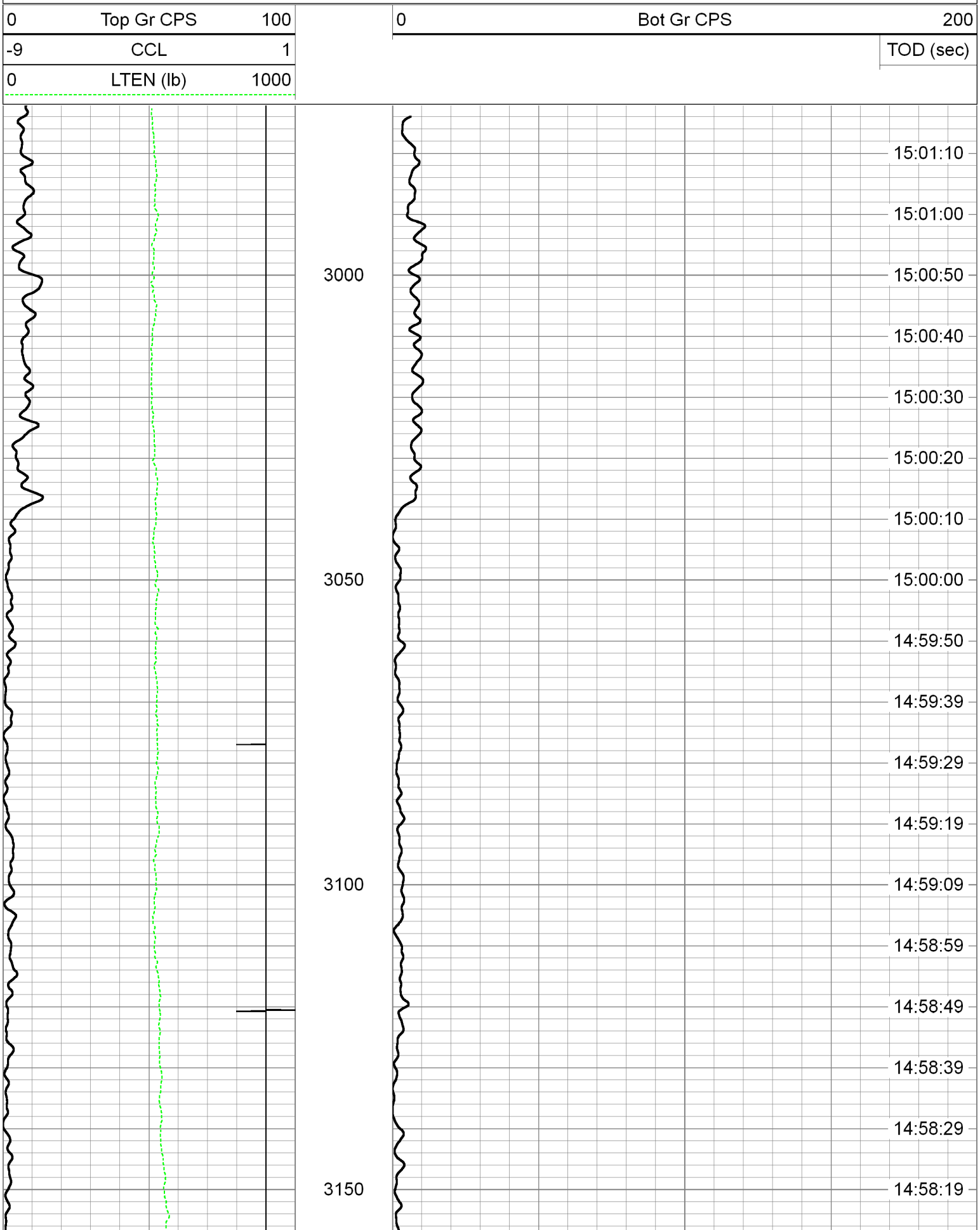
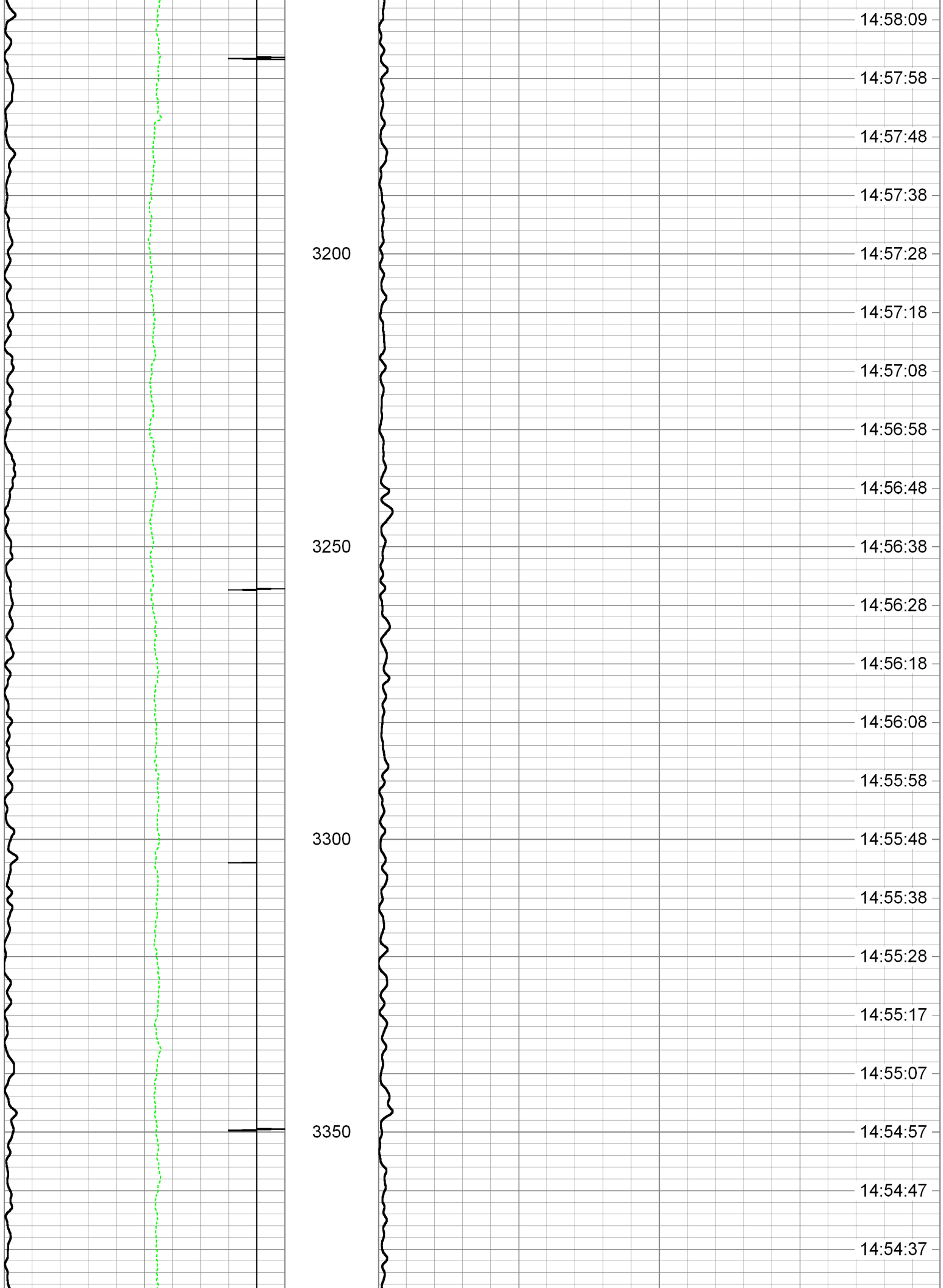
Presentation Format	tracermwl
Dataset Creation	Tue Aug 06 14:36:26 2024
Charted by	Depth in Feet scaled 1:240

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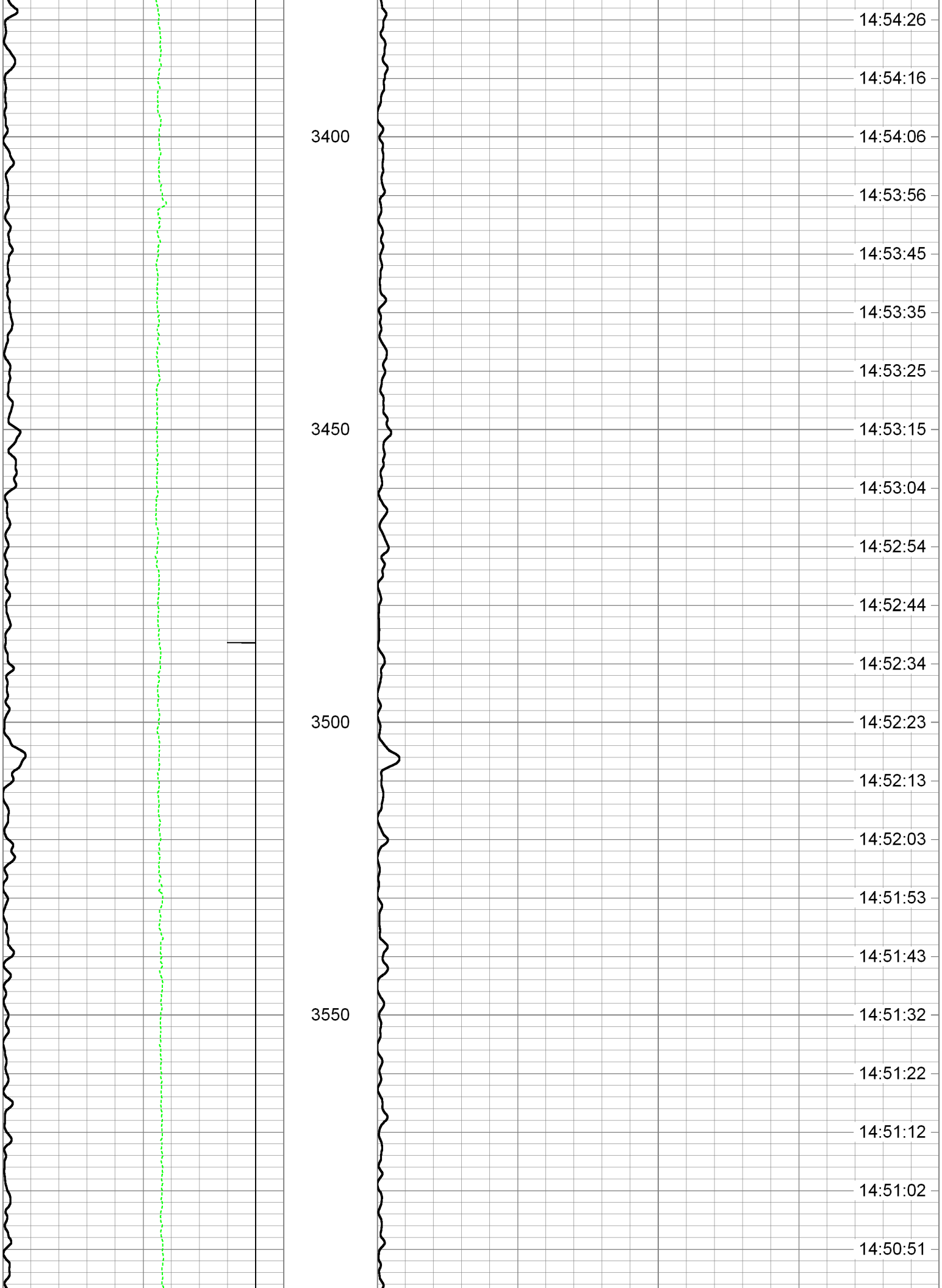
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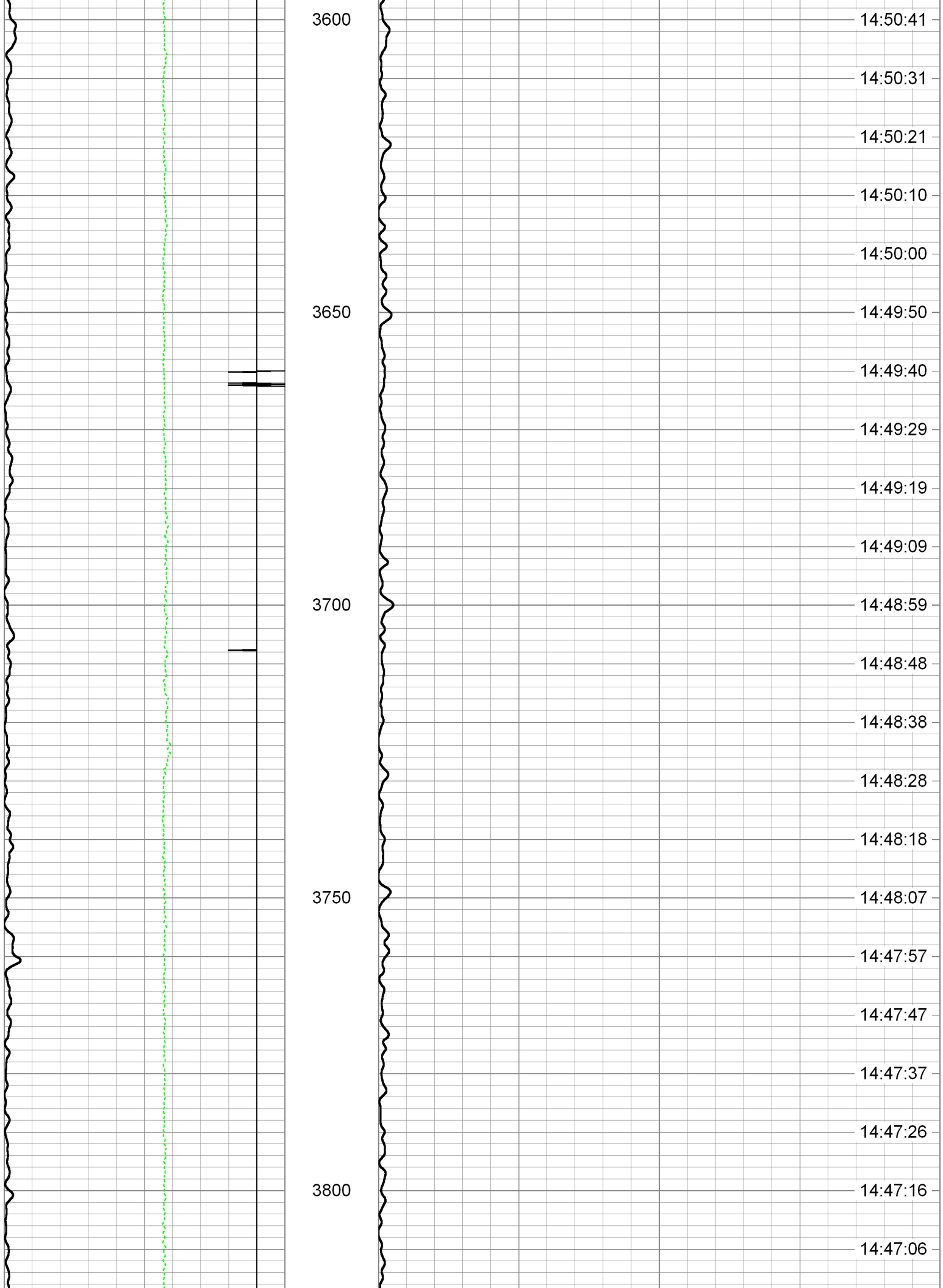
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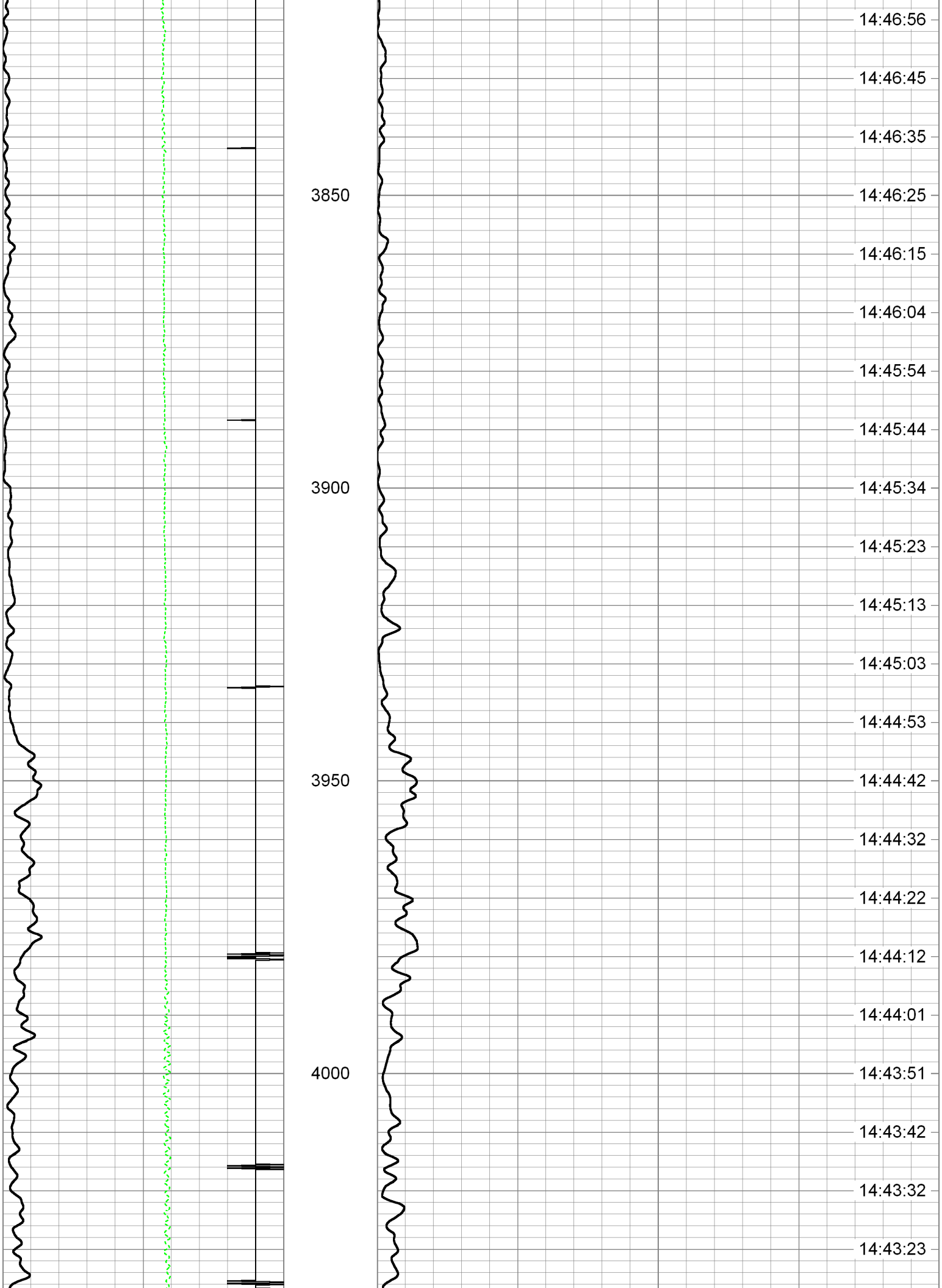
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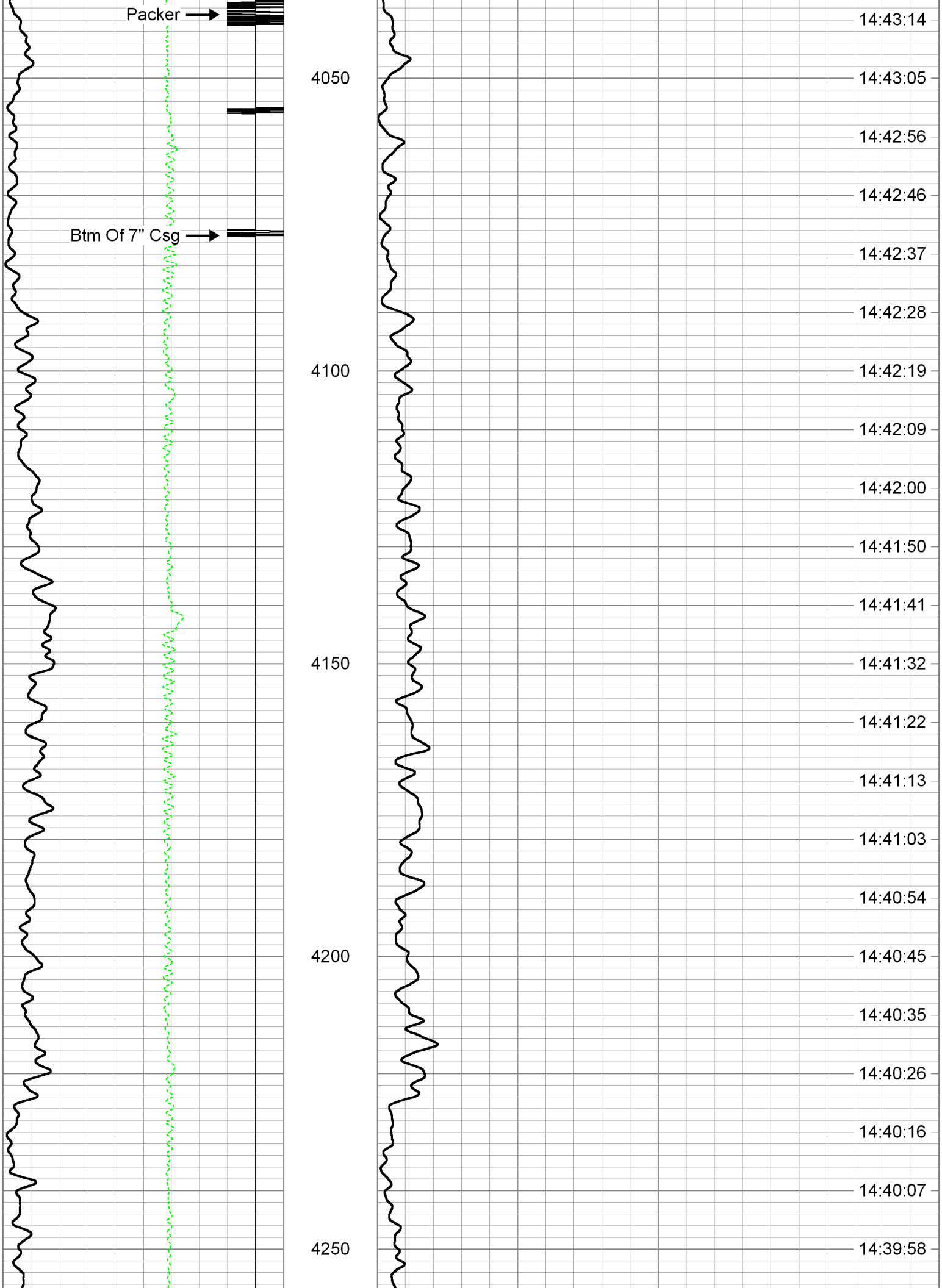
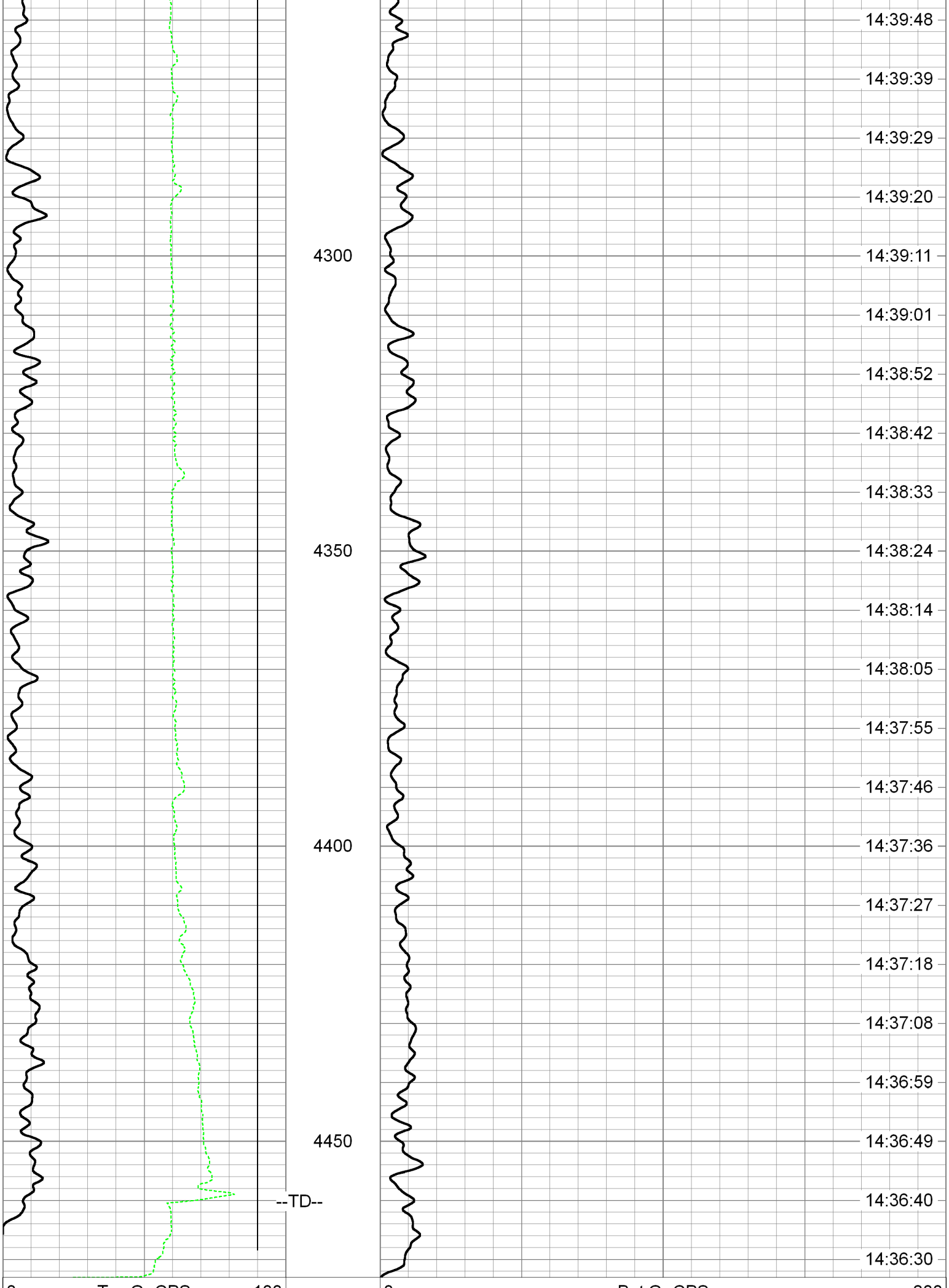
14:44:32
14:44:22
14:44:12
14:44:01
14:43:51
14:43:42
14:43:32
14:43:23


Packer
Btm Of 7" Csg
4050
4100
4150
4200
4250
14:43:14
14:43:05
14:42:56
14:42:46
14:42:37
14:42:28
14:42:19
14:42:09
14:42:00
14:41:50
14:41:41
14:41:32
14:41:22
14:41:13
14:41:03
14:40:54
14:40:45
14:40:35
14:40:26
14:40:16
14:40:07
14:39:58


14:39:48
14:39:39
14:39:29
14:39:20
14:39:11
14:39:01
14:38:52
14:38:42
14:38:33
14:38:24
14:38:14
14:38:05
14:37:55
14:37:46
14:37:36
14:37:27
14:37:18
14:37:08
14:36:59
14:36:49
14:36:40
14:36:30
4300
4350
4400
4450
--TD--
0
Top Gr CPS
100
0
Bot Gr CPS
200

-9	CCL	1
0	LTEN (lb)	1000

TOD (sec)

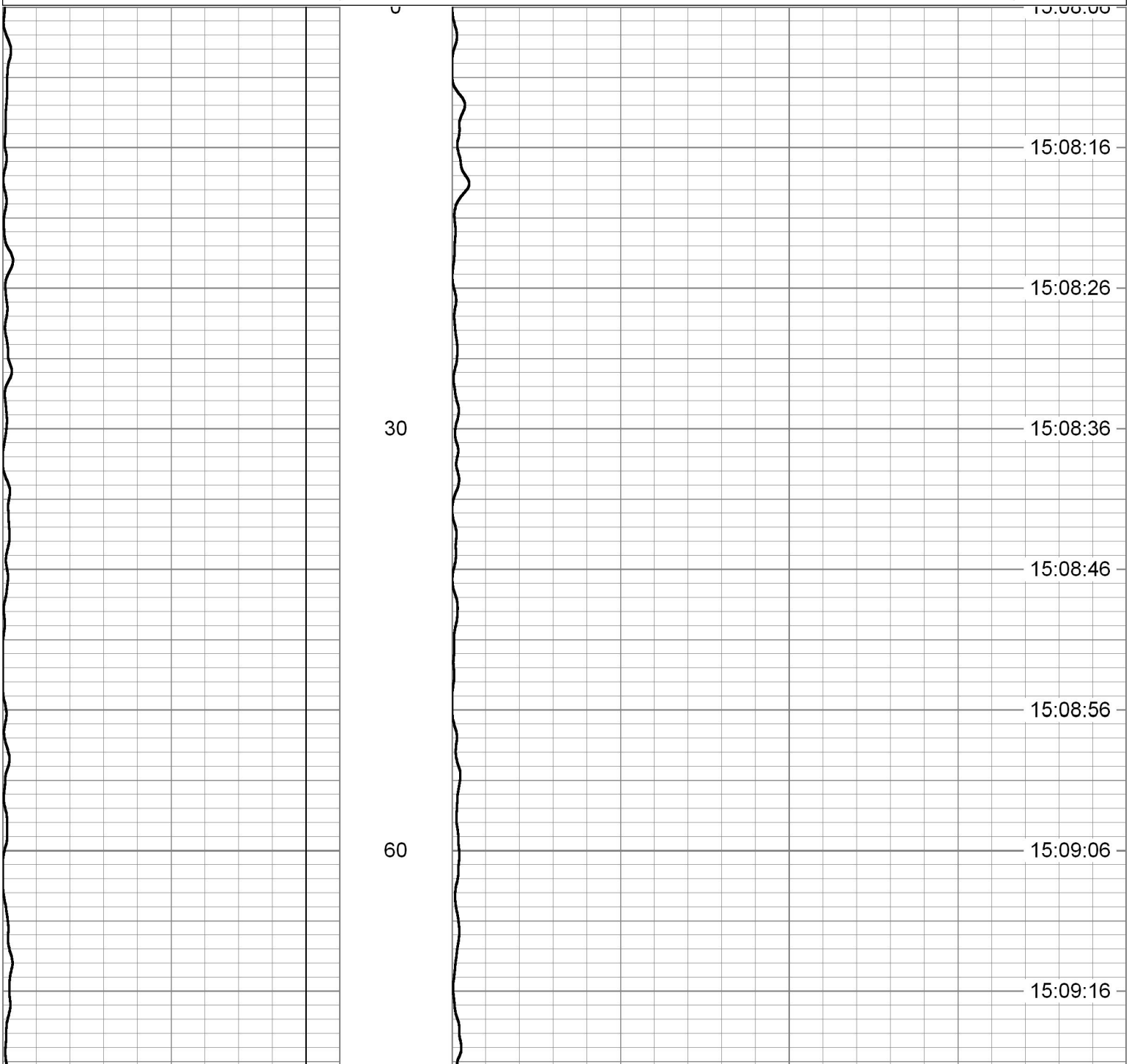
michigan wireline services

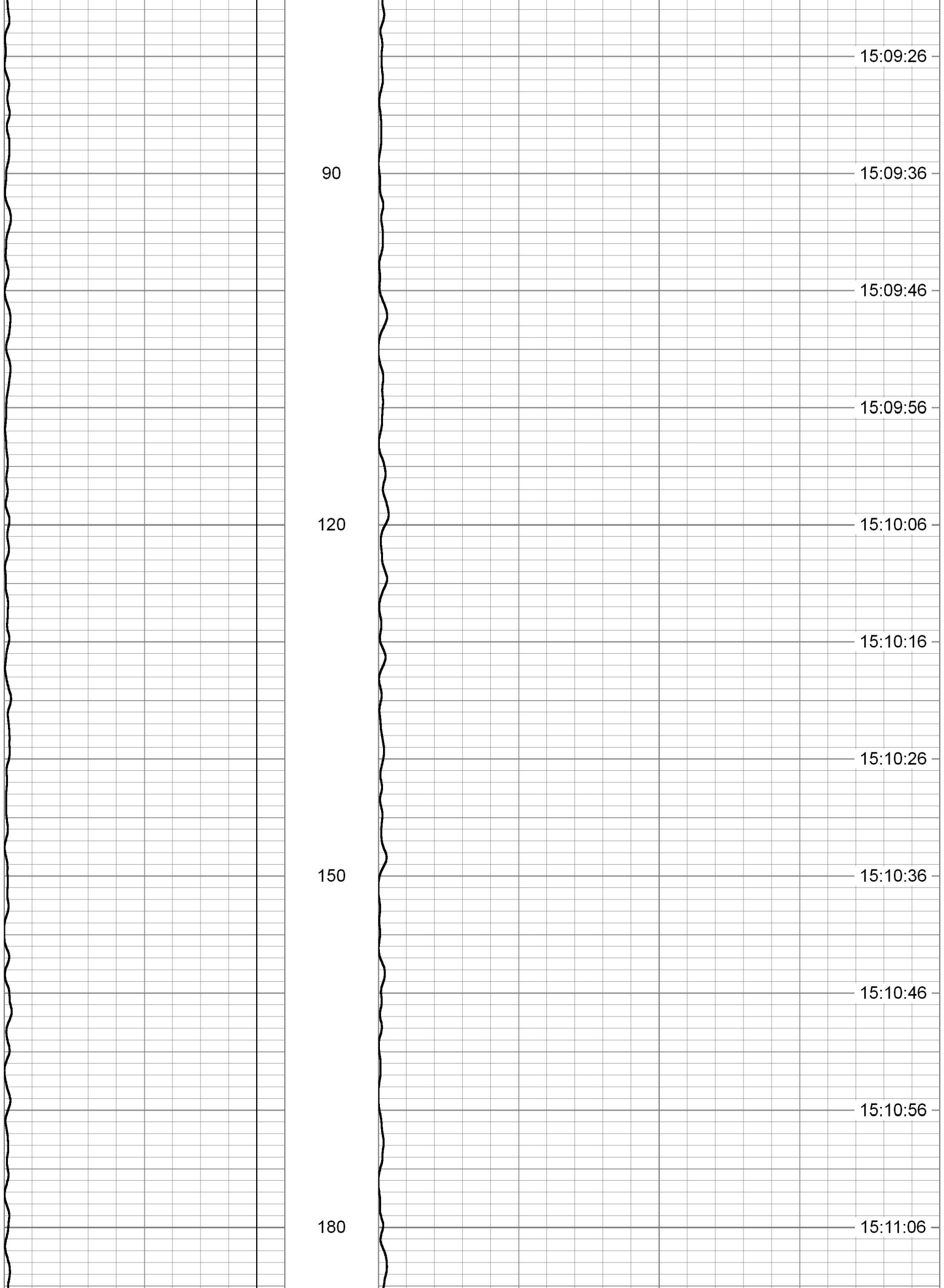
5 MIN STAT CHECK 3802'

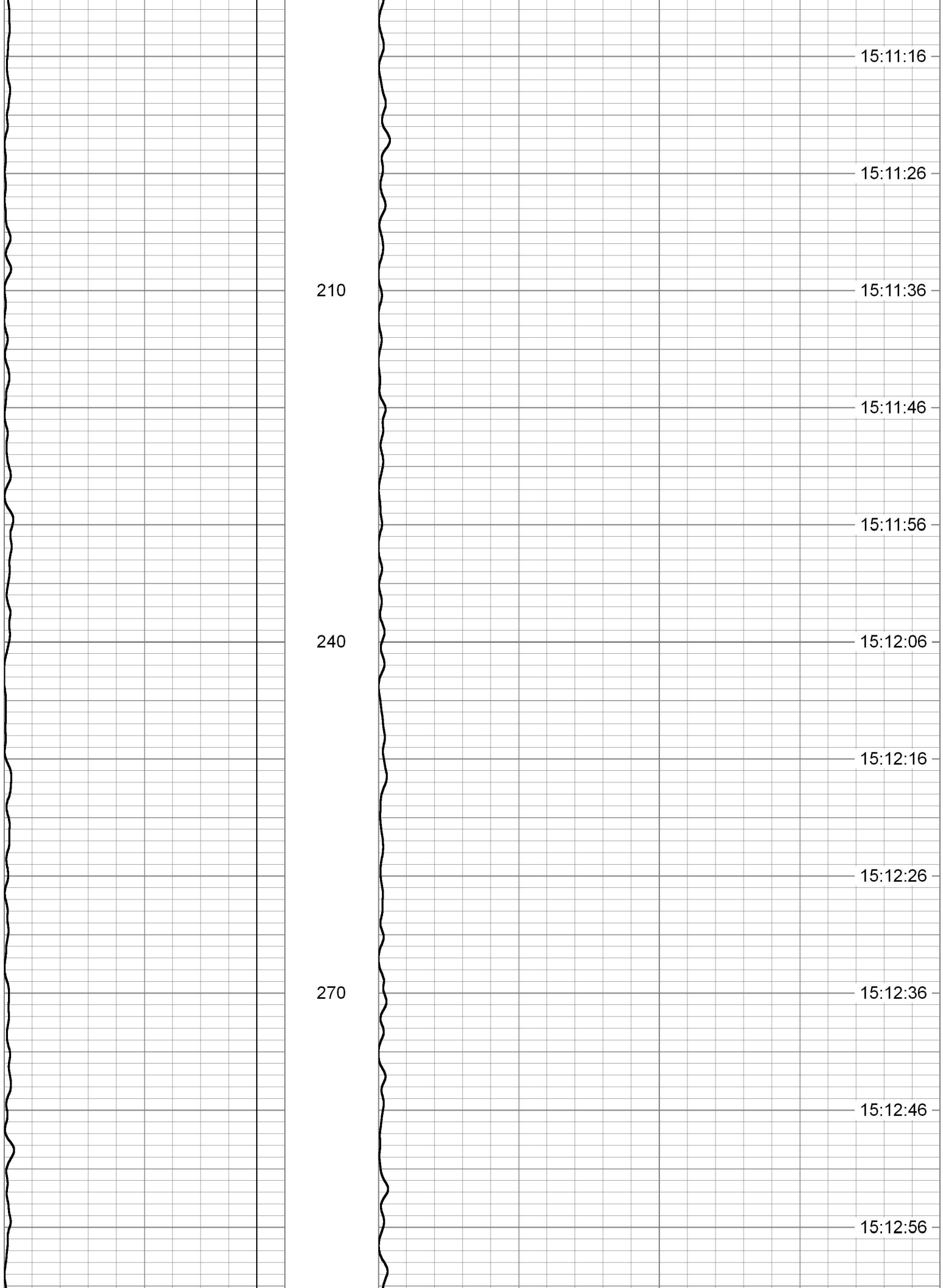
Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	5MIN3802
Presentation Format	tracer_time_10
Dataset Creation	Tue Aug 06 15:08:06 2024
Charted by	Time scaled 360/hour

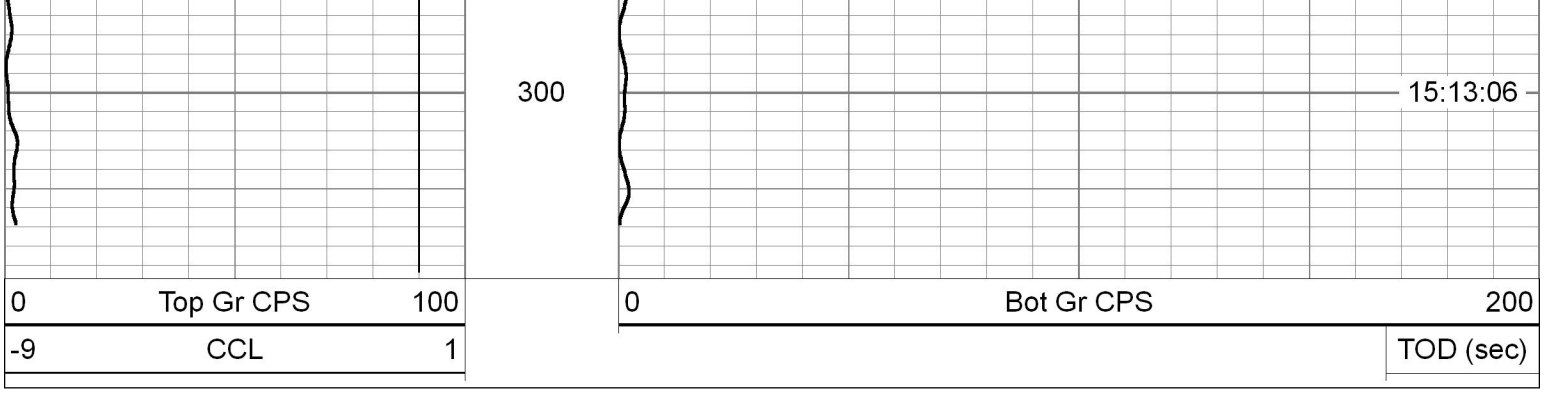
0	Top Gr CPS	100
-9	CCL	1

0	Bot Gr CPS 200
	TOD (sec)




15:09:26
90
15:09:36
15:09:46
15:09:56
120
15:10:06
15:10:16
15:10:26
150
15:10:36
15:10:46
15:10:56
180
15:11:06


15:11:16
15:11:26
210
15:11:36
15:11:46
15:11:56
240
15:12:06
15:12:16
15:12:26
270
15:12:36
15:12:46
15:12:56



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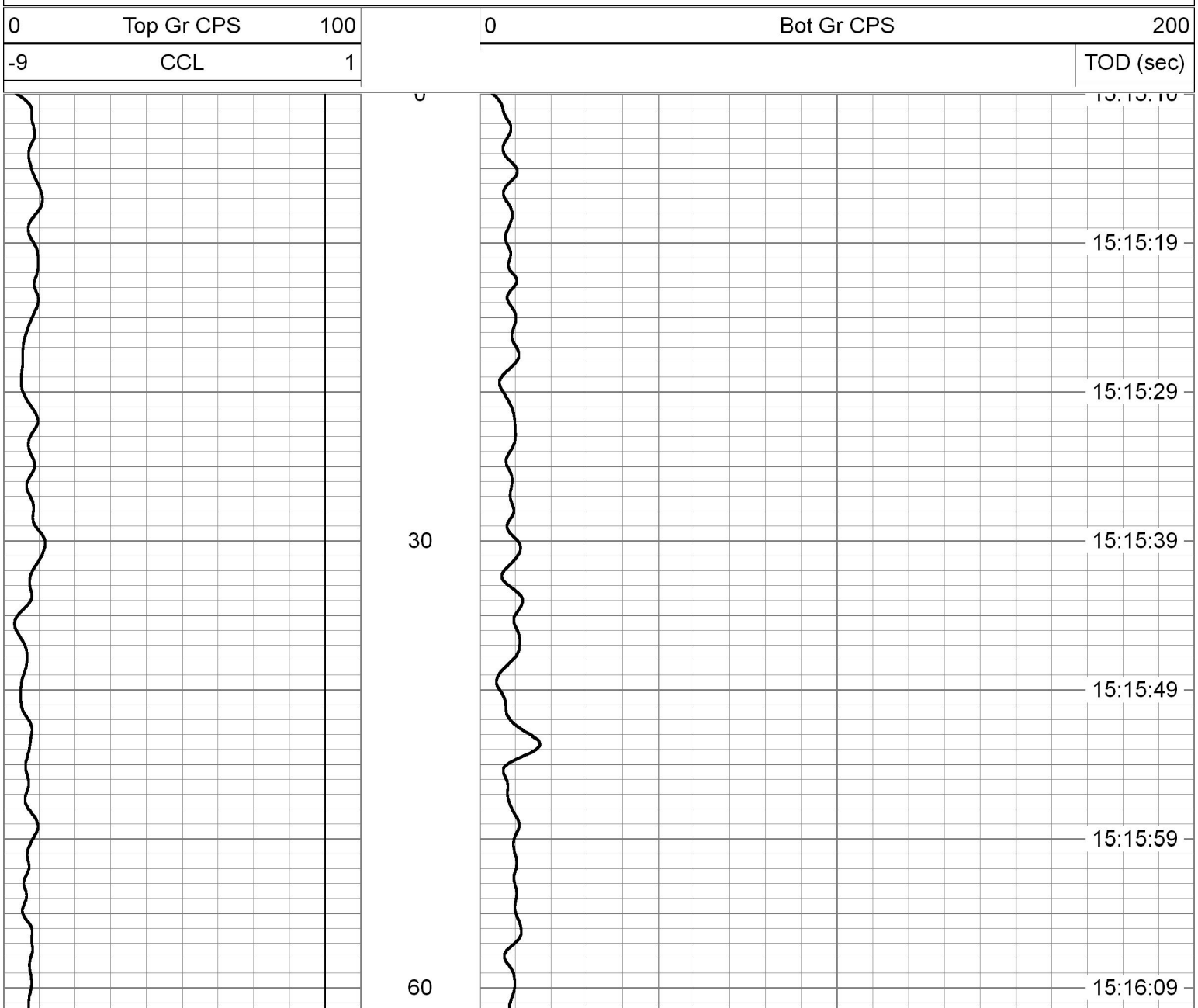
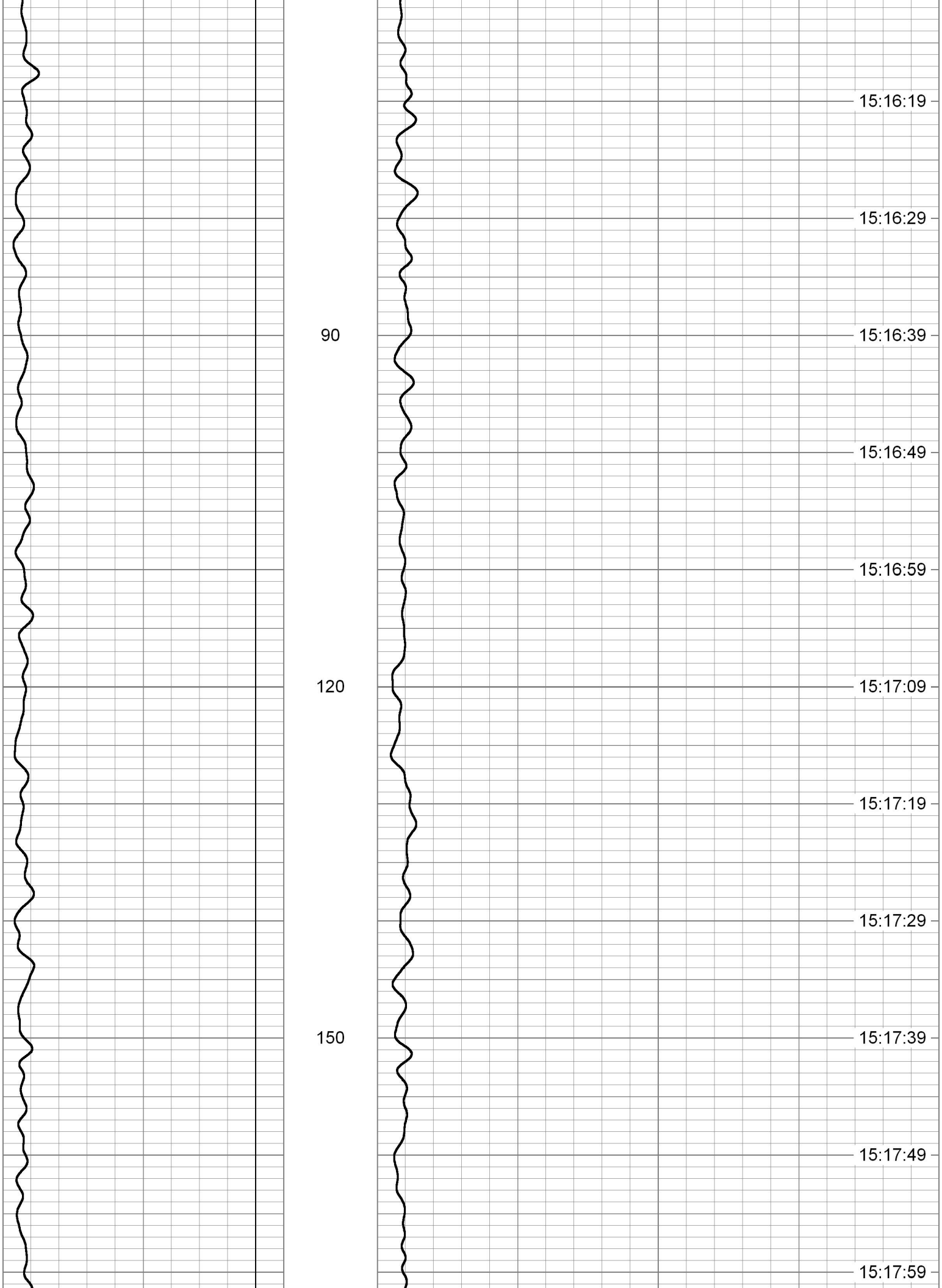
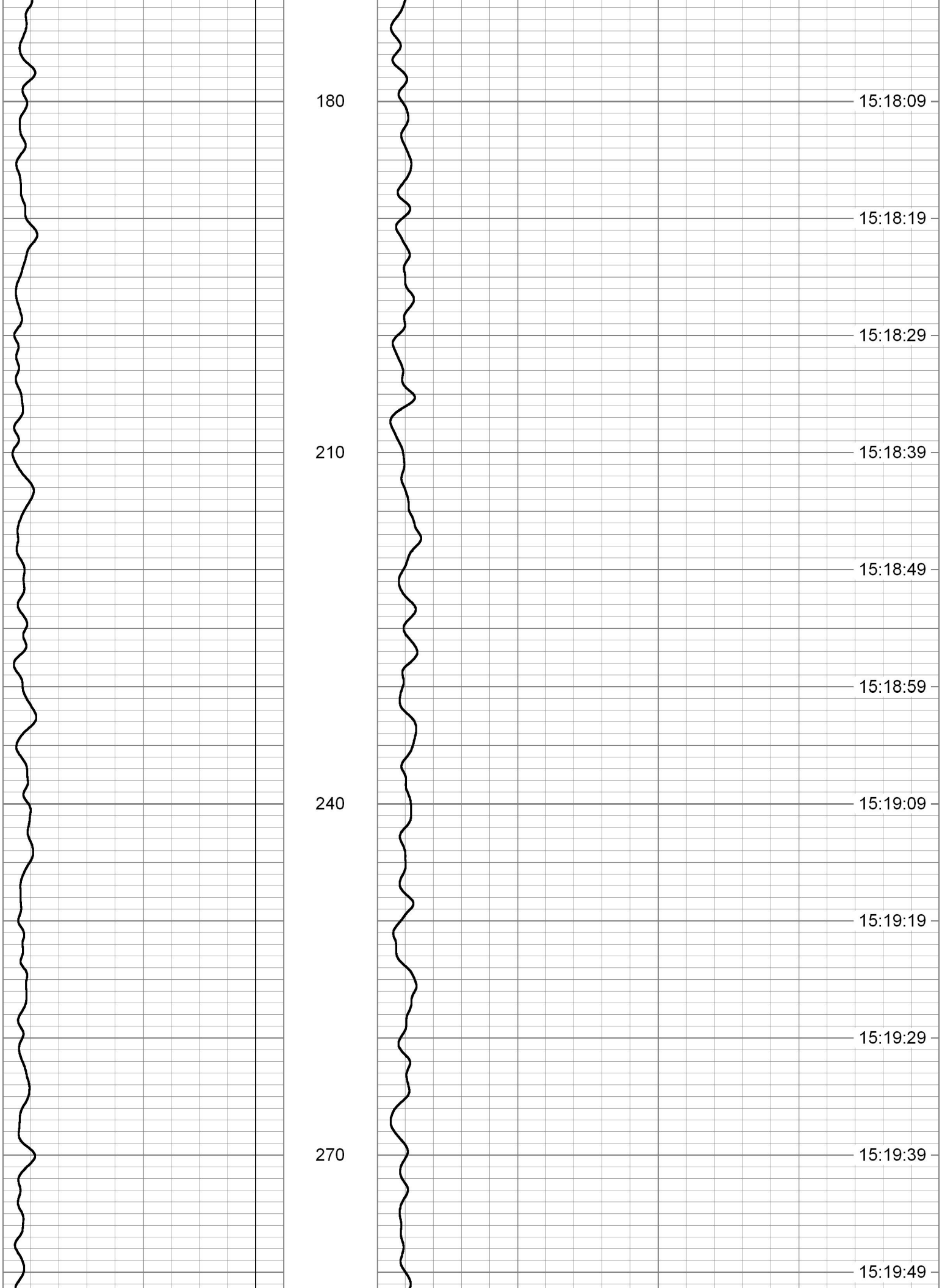
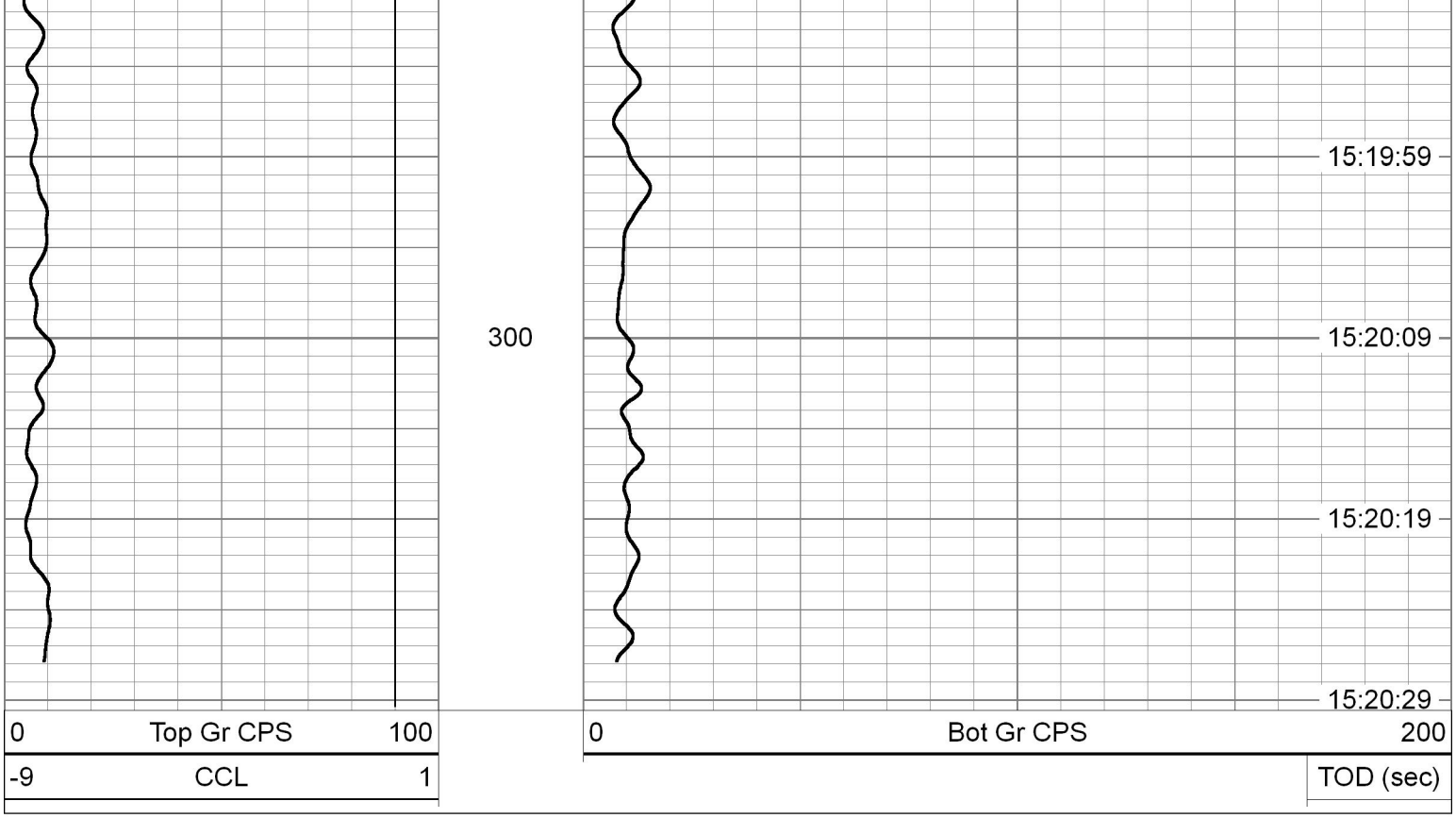
5 MIN STAT CHECK 3955'

Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	5MIN3955
Presentation Format	tracer_time_10
Dataset Creation	Tue Aug 06 15:15:10 2024
Charted by	Time scaled 360/hour




15:16:19
15:16:29
90
15:16:39
15:16:49
15:16:59
120
15:17:09
15:17:19
15:17:29
150
15:17:39
15:17:49
15:17:59


180
210
240
270
15:18:09
15:18:19
15:18:29
15:18:39
15:18:49
15:18:59
15:19:09
15:19:19
15:19:29
15:19:39
15:19:49



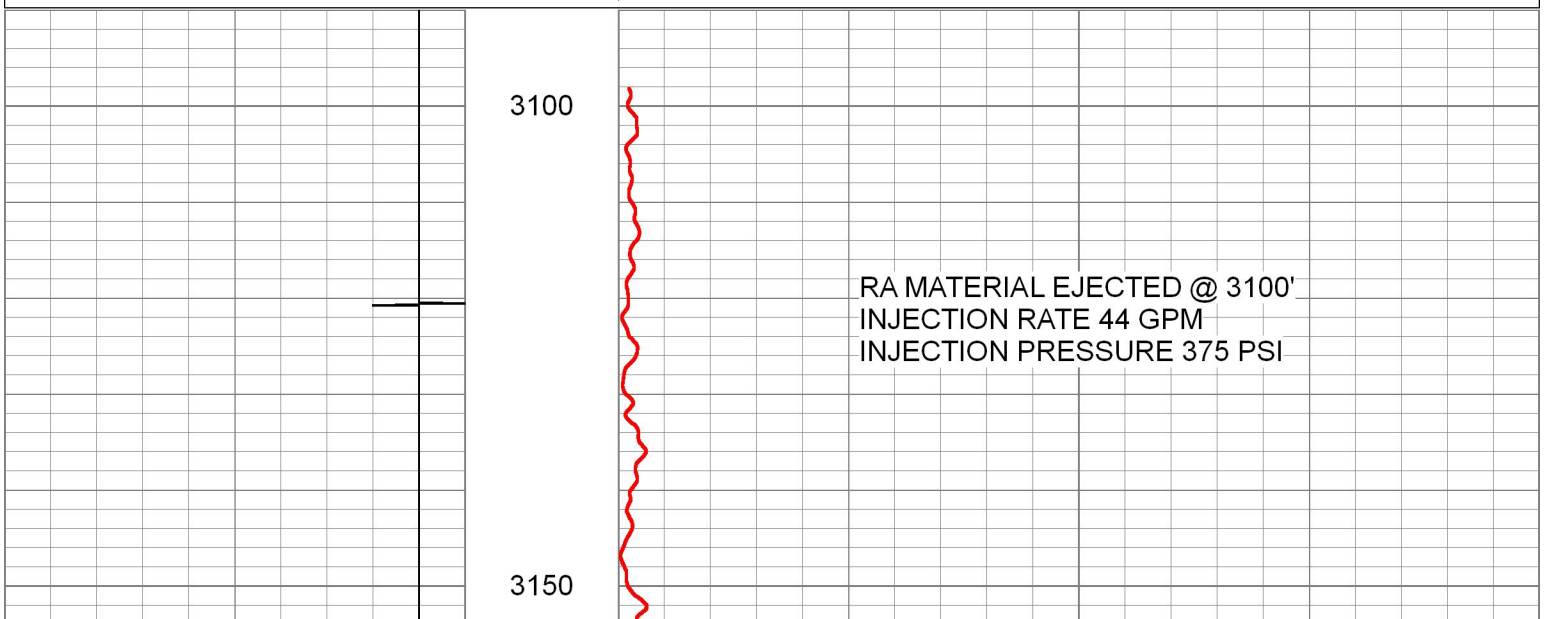
michigan wireline services

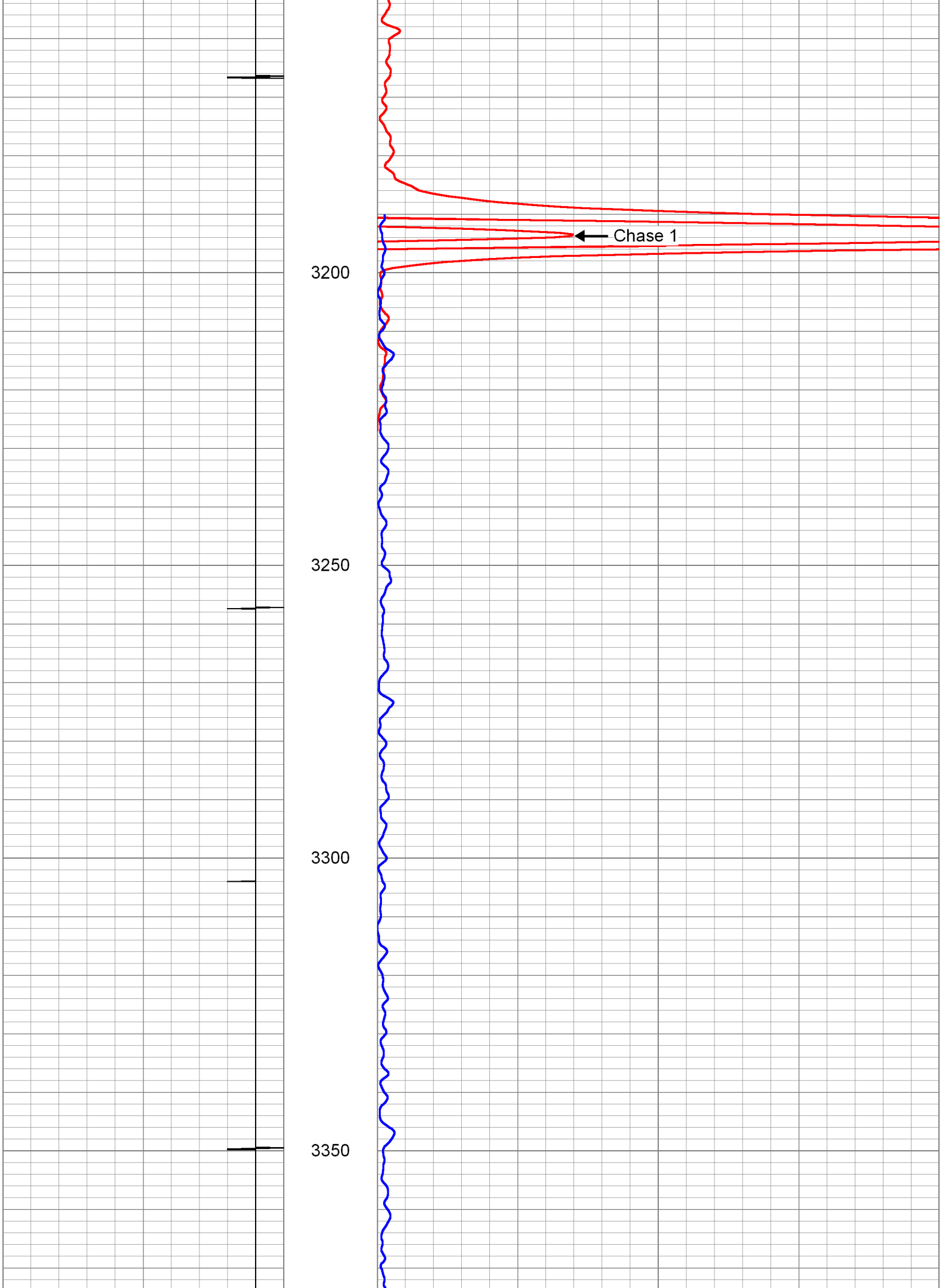
CHASE MERGED PASSES

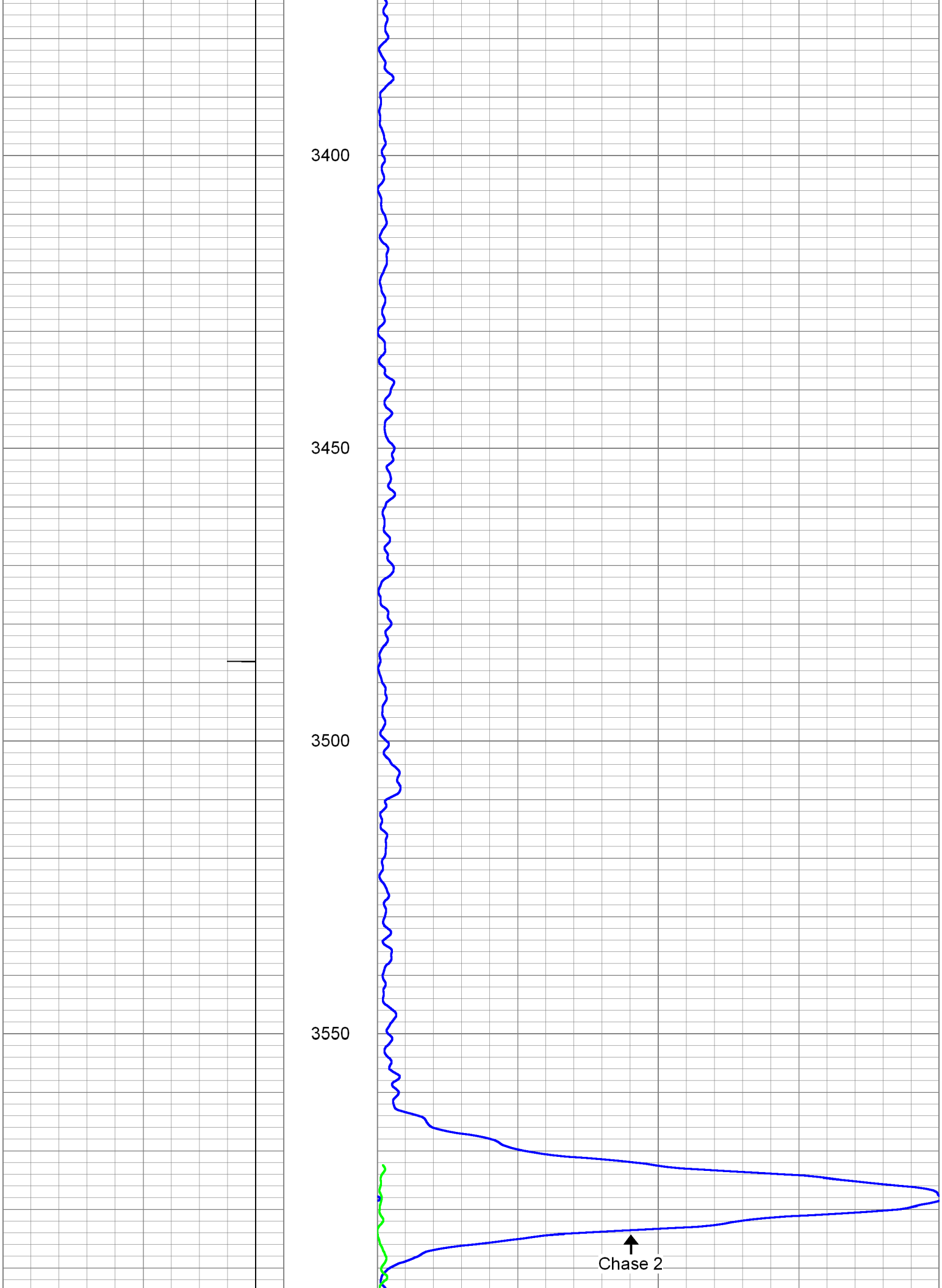
RA MATERIAL EJECTED @ 3100'
INJECTION 44 GPM 375 PSI

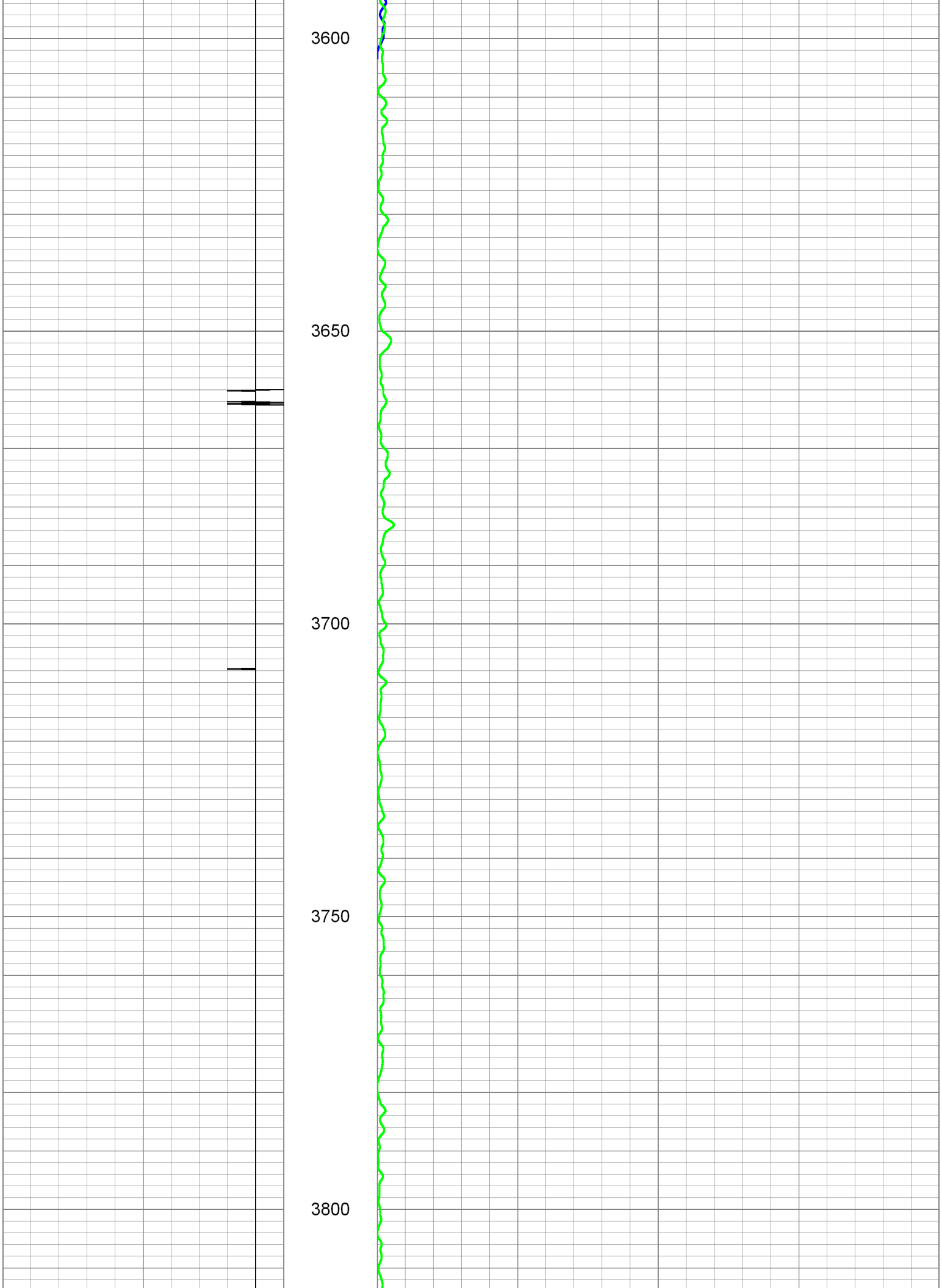
Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	CHASE
Presentation Format	tracer_chase
Dataset Creation	Tue Aug 06 16:30:50 2024
Charted by	Depth in Feet scaled 1:240

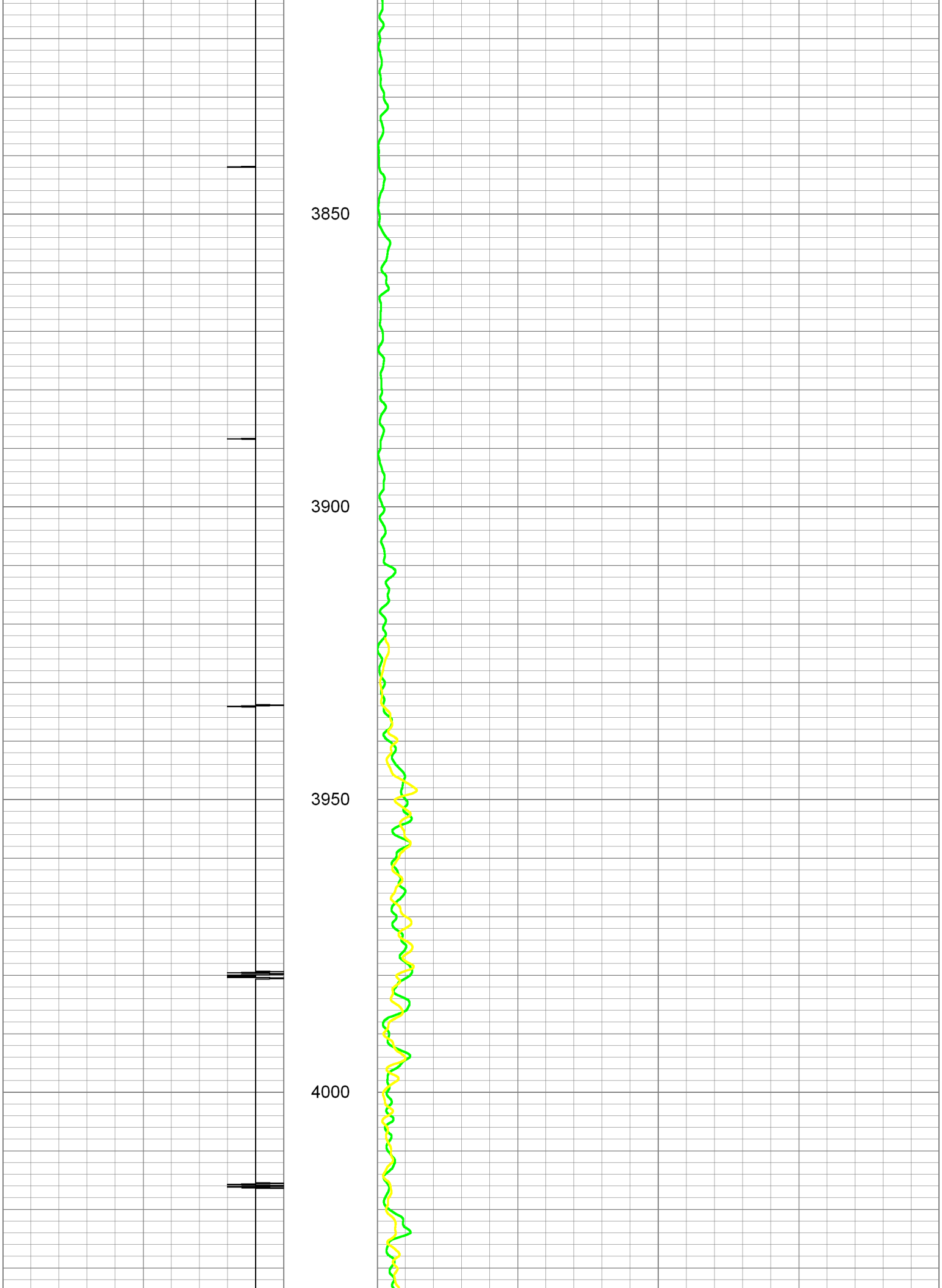
-9	CCL	1
0	Chase 1	200
0	Chase 2	200
0	Chase 3	200
0	Chase 4	200

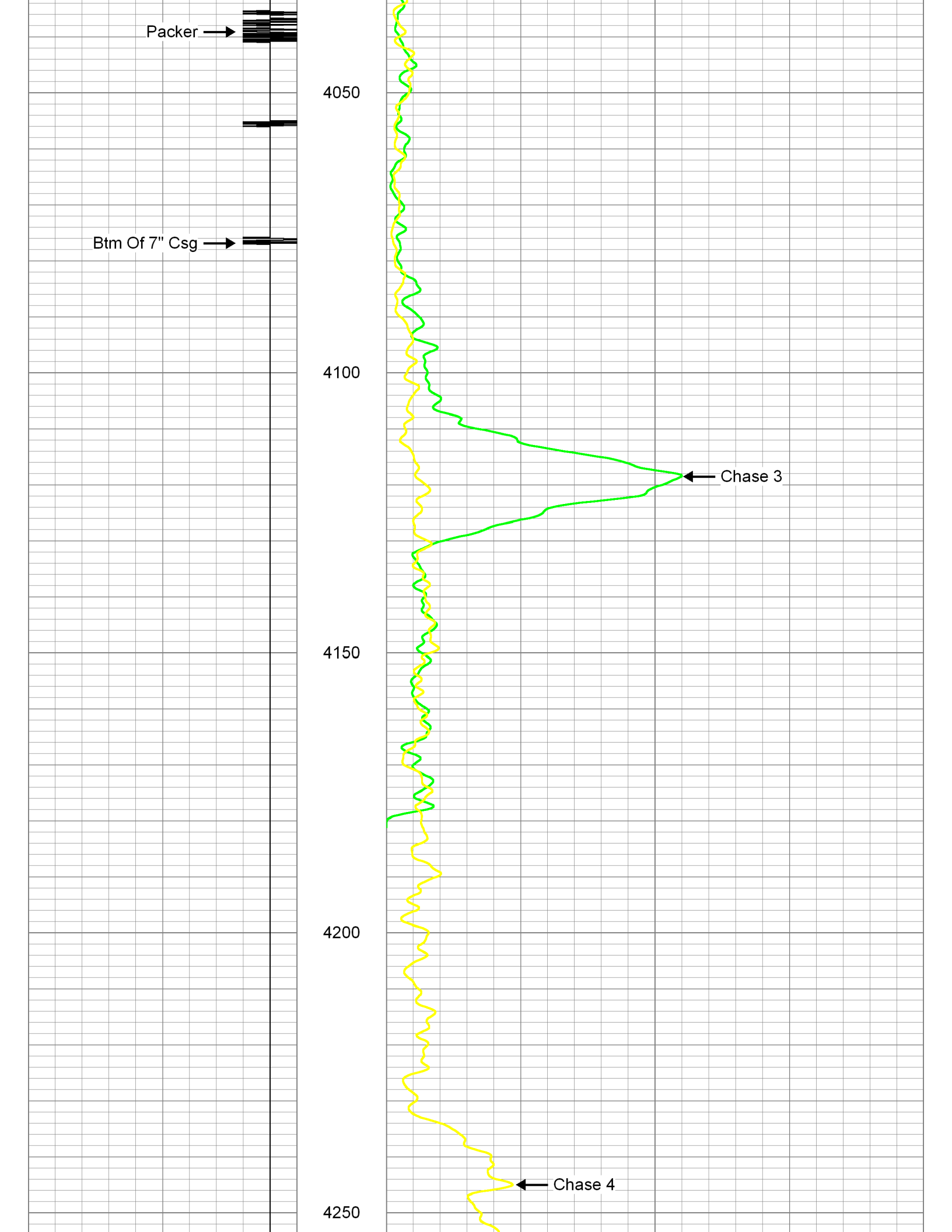


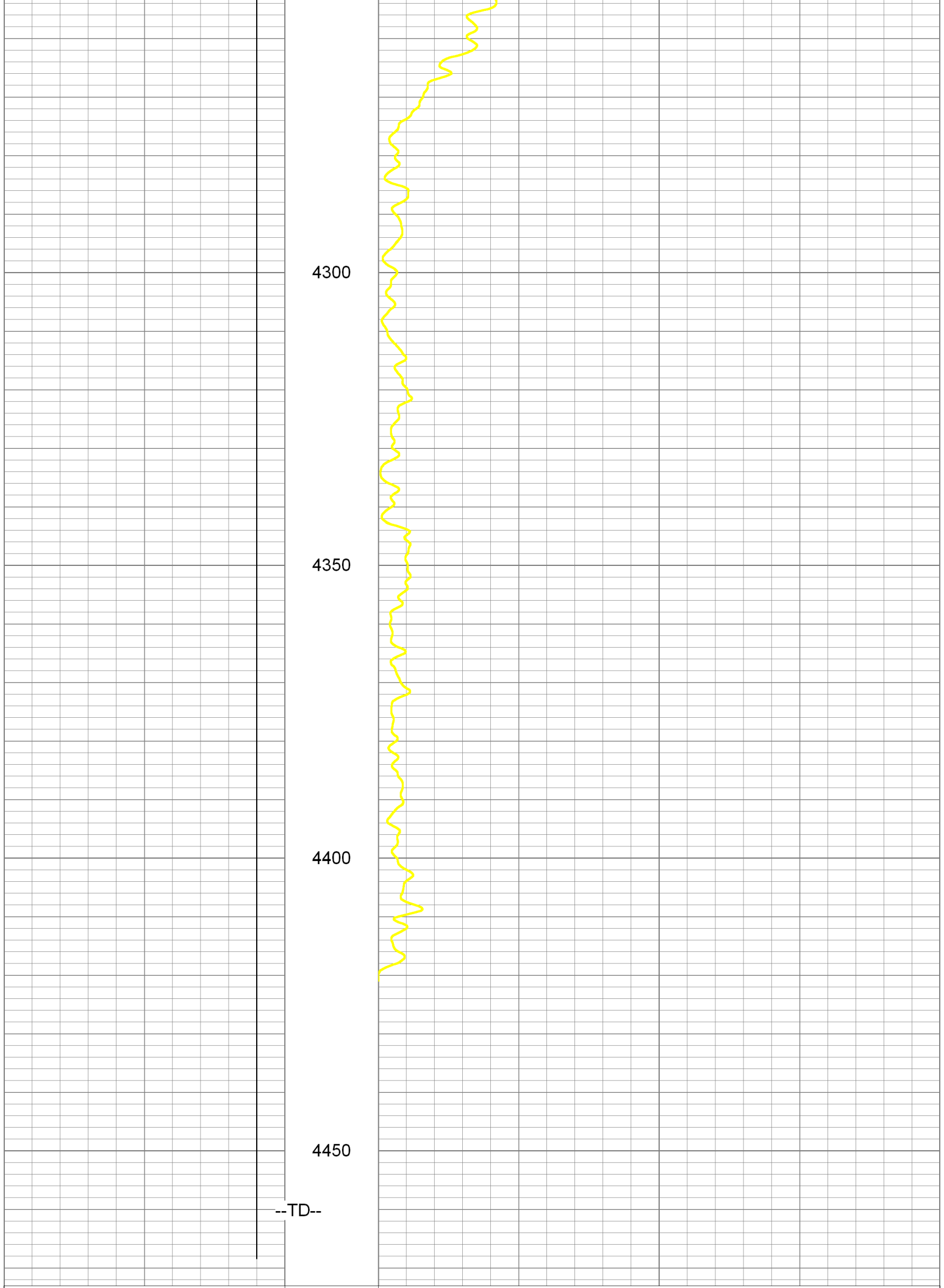

Chase 1
3200
3250
3300
3350


3400
3450
3500
3550
Chase 2


3600
3650
3700
3750
3800


3850
3900
3950
4000


Packer
Btm Of 7" Csg
4050
4100
Chase 3
4150
4200
Chase 4
4250


4300
4350
4400
4450
--TD--

-9	CCL	1

0	Chase 1	200
0	Chase 2	200
0	Chase 3	200
0	Chase 4	200

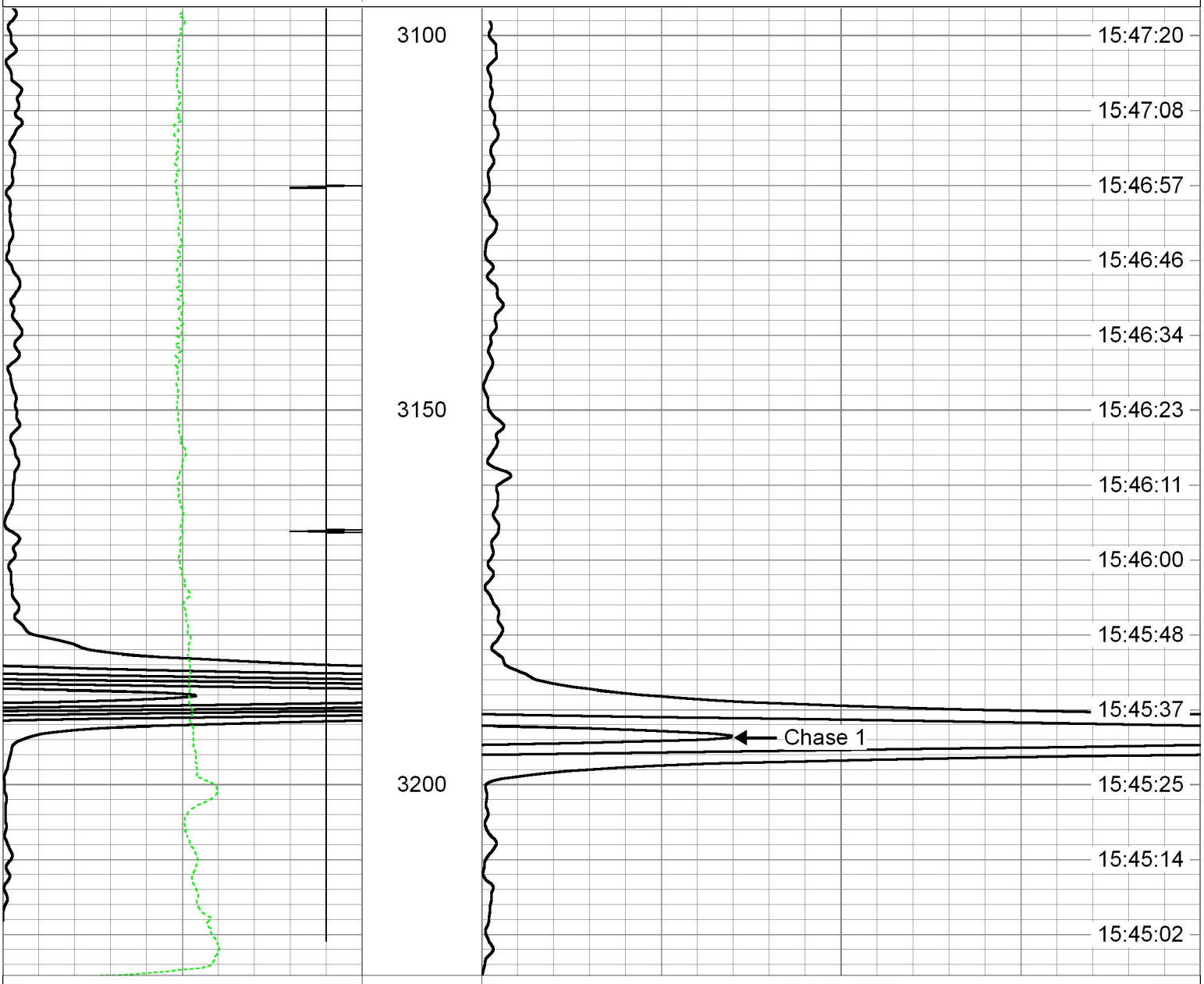
michigan wireline services

CHASE 1

Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	CHASE1
Presentation Format	tracermwl
Dataset Creation	Tue Aug 06 15:44:55 2024
Charted by	Depth in Feet scaled 1:240

0	Top Gr CPS	100
-9	CCL	1
0	LTEN (lb)	1000

0	Bot Gr CPS	200
	TOD (sec)	



0	Top Gr CPS	100
-9	CCL	1

0	Bot Gr CPS	200
	TOD (sec)	

0	LTEN (lb)	1000

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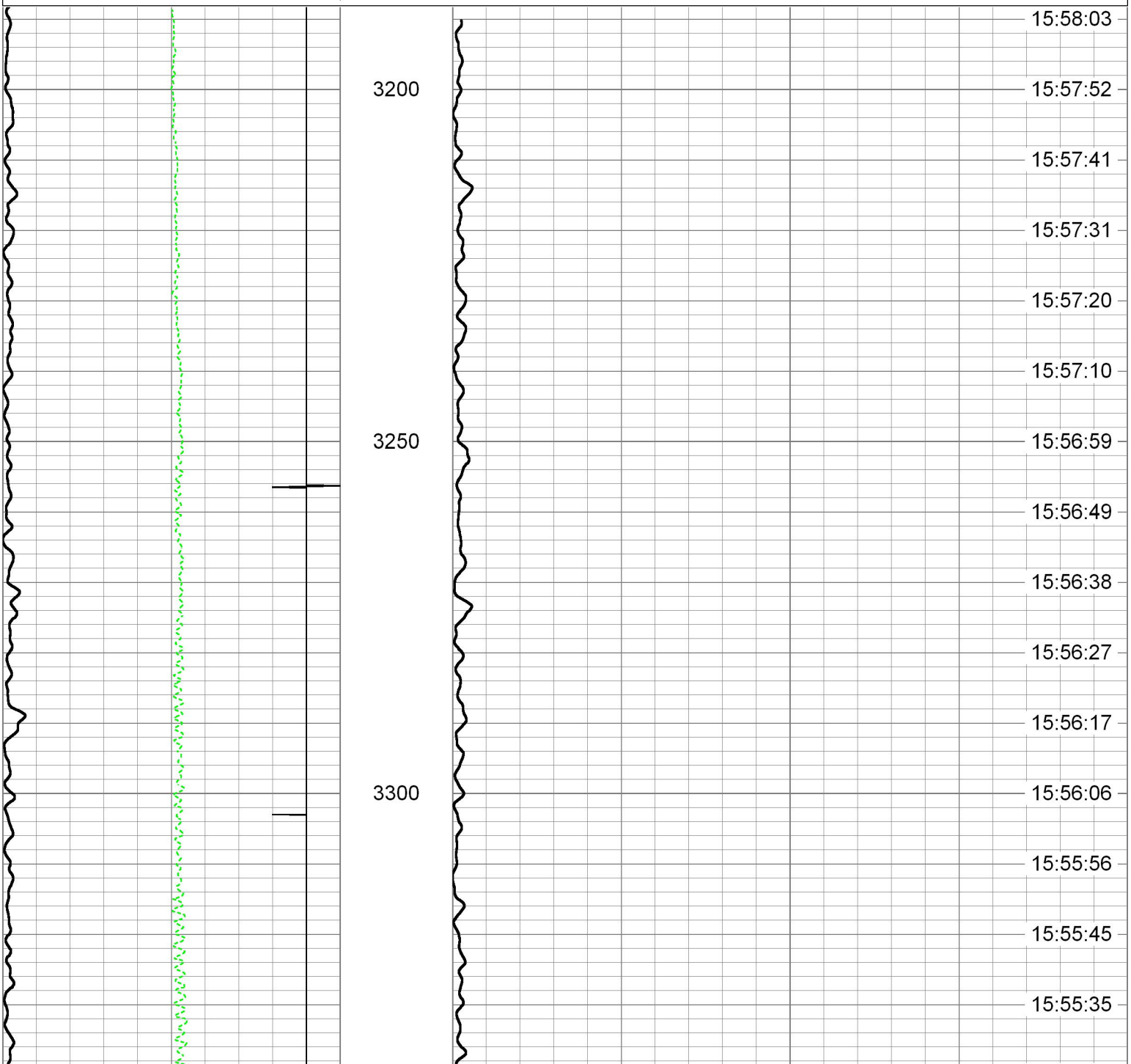
CHASE 2

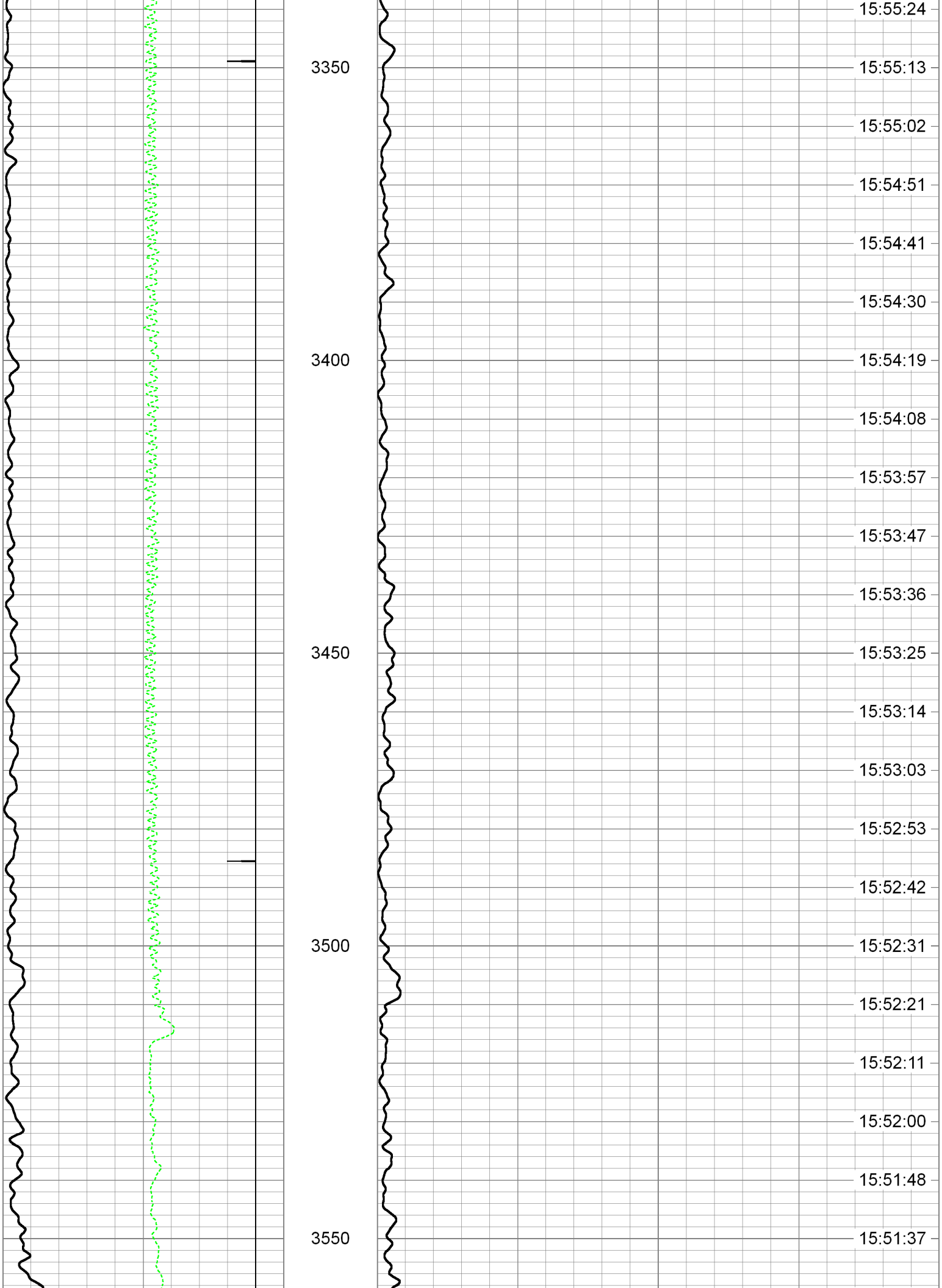
Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	CHASE2
Presentation Format	tracermwl
Dataset Creation	Tue Aug 06 15:50:38 2024
Charted by	Depth in Feet scaled 1:240

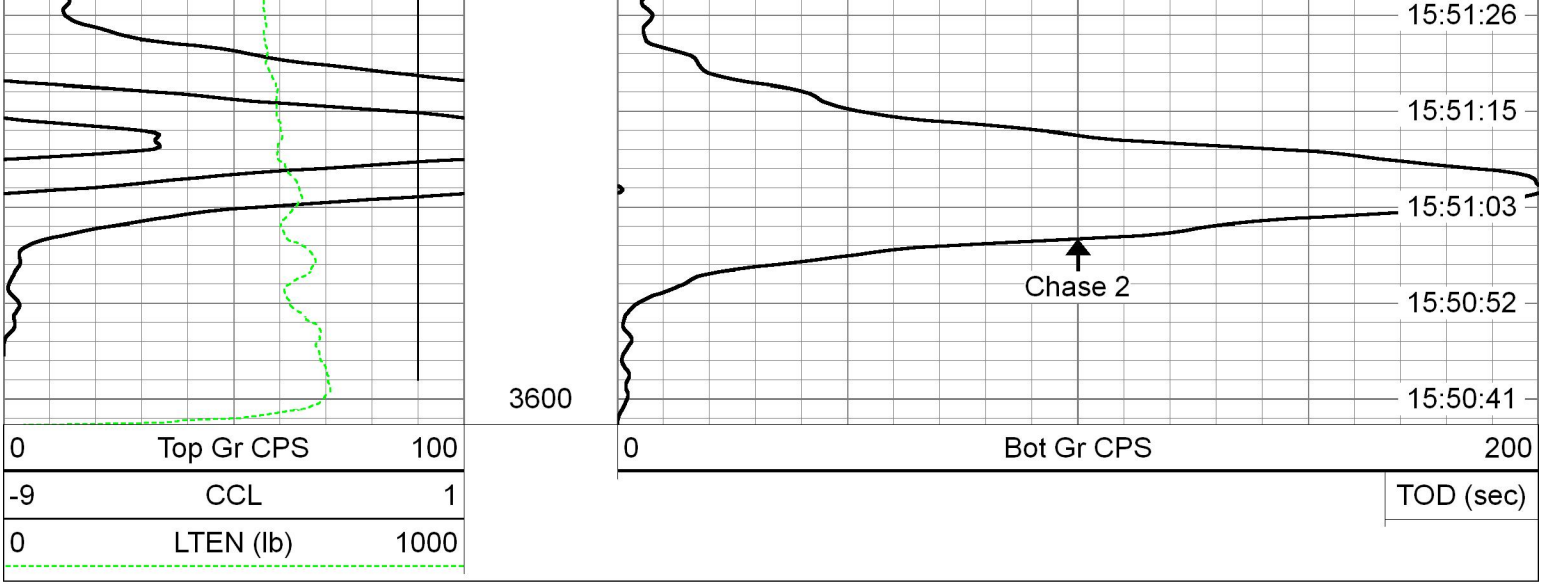
0	Top Gr CPS	100
-9	CCL	1
0	LTEN (lb)	1000

0	Bot Gr CPS	200

TOD (sec)




3350
3400
3450
3500
3550
15:55:24
15:55:13
15:55:02
15:54:51
15:54:41
15:54:30
15:54:19
15:54:08
15:53:57
15:53:47
15:53:36
15:53:25
15:53:14
15:53:03
15:52:53
15:52:42
15:52:31
15:52:21
15:52:11
15:52:00
15:51:48
15:51:37



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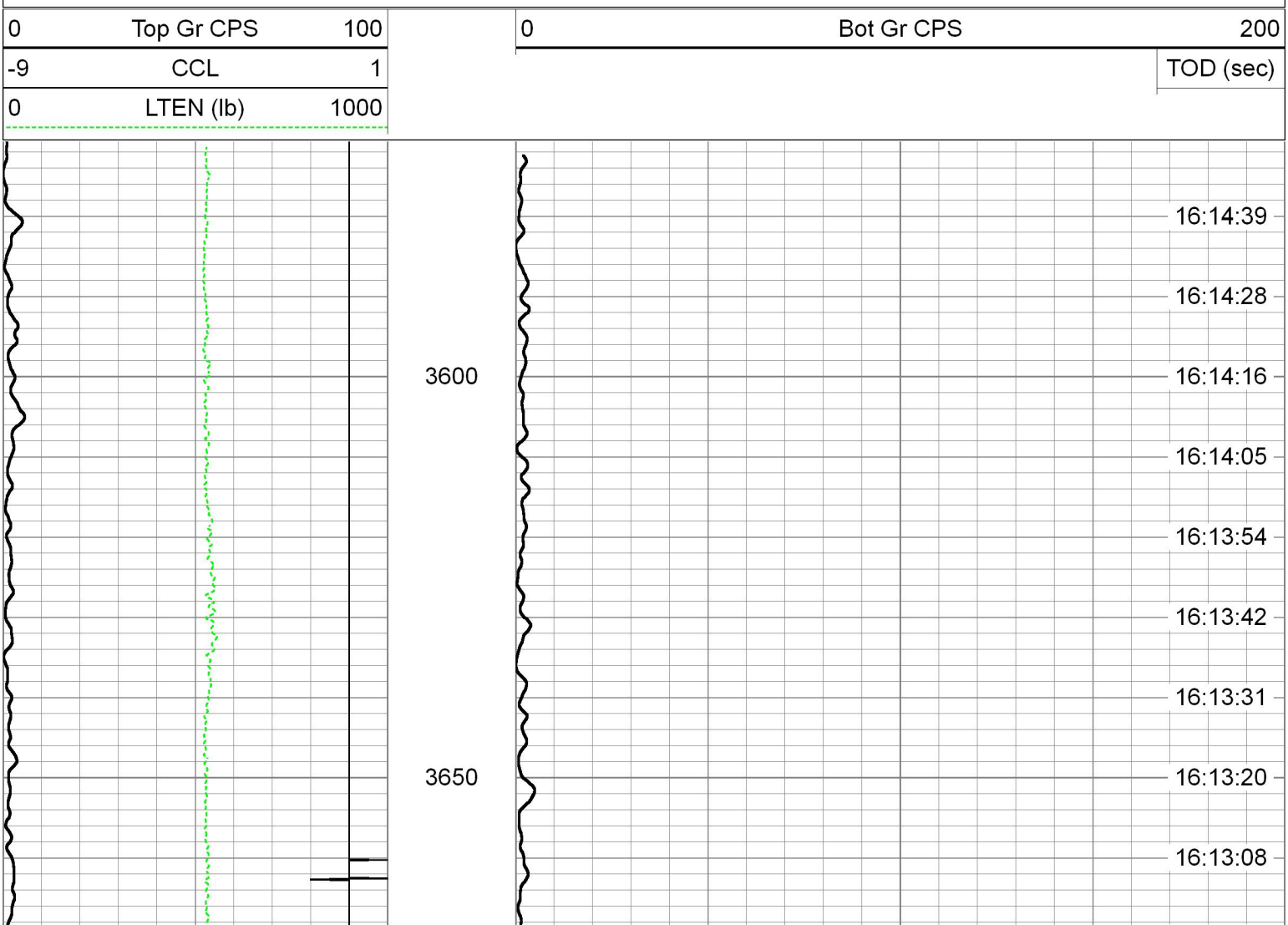
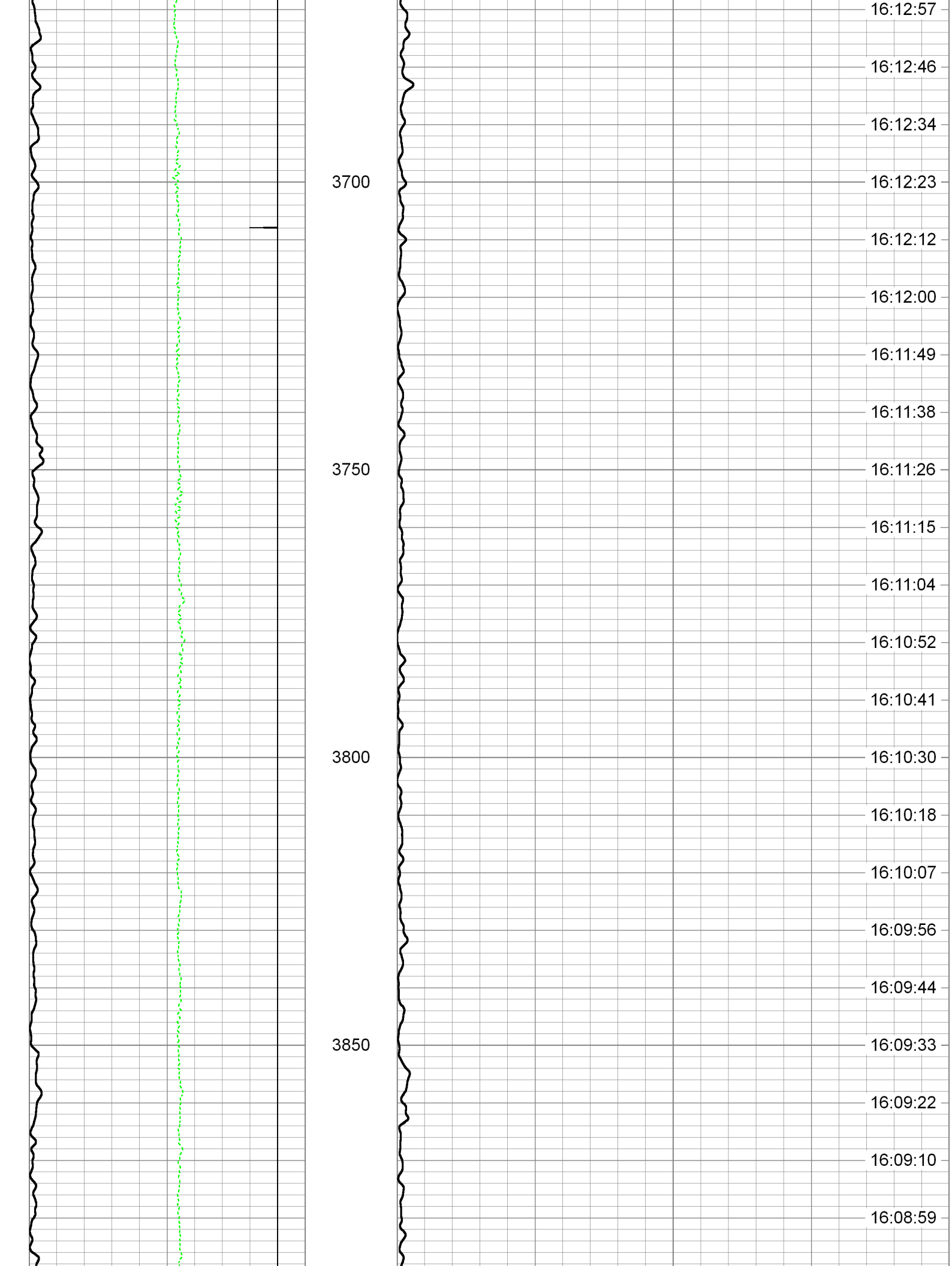
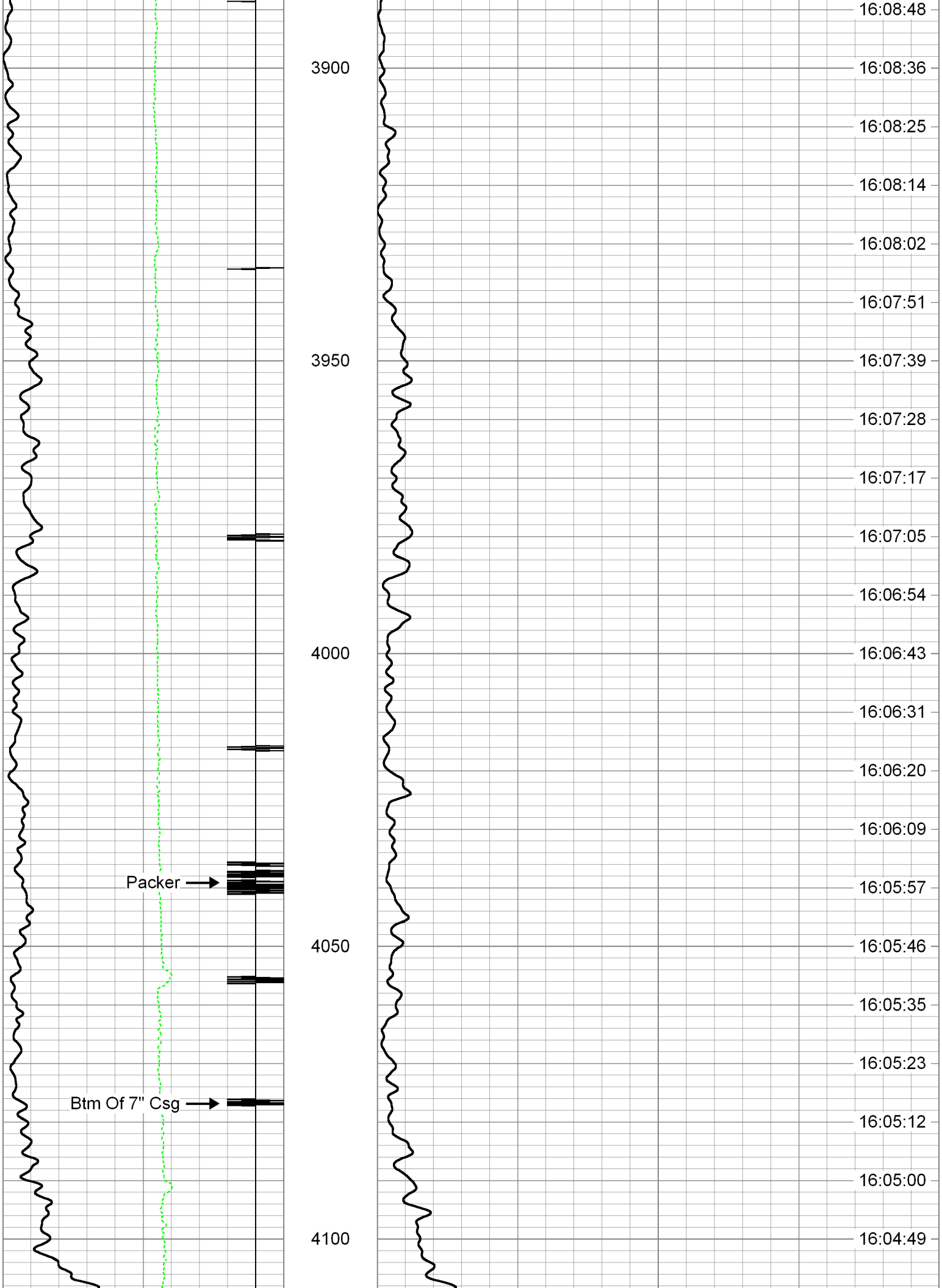
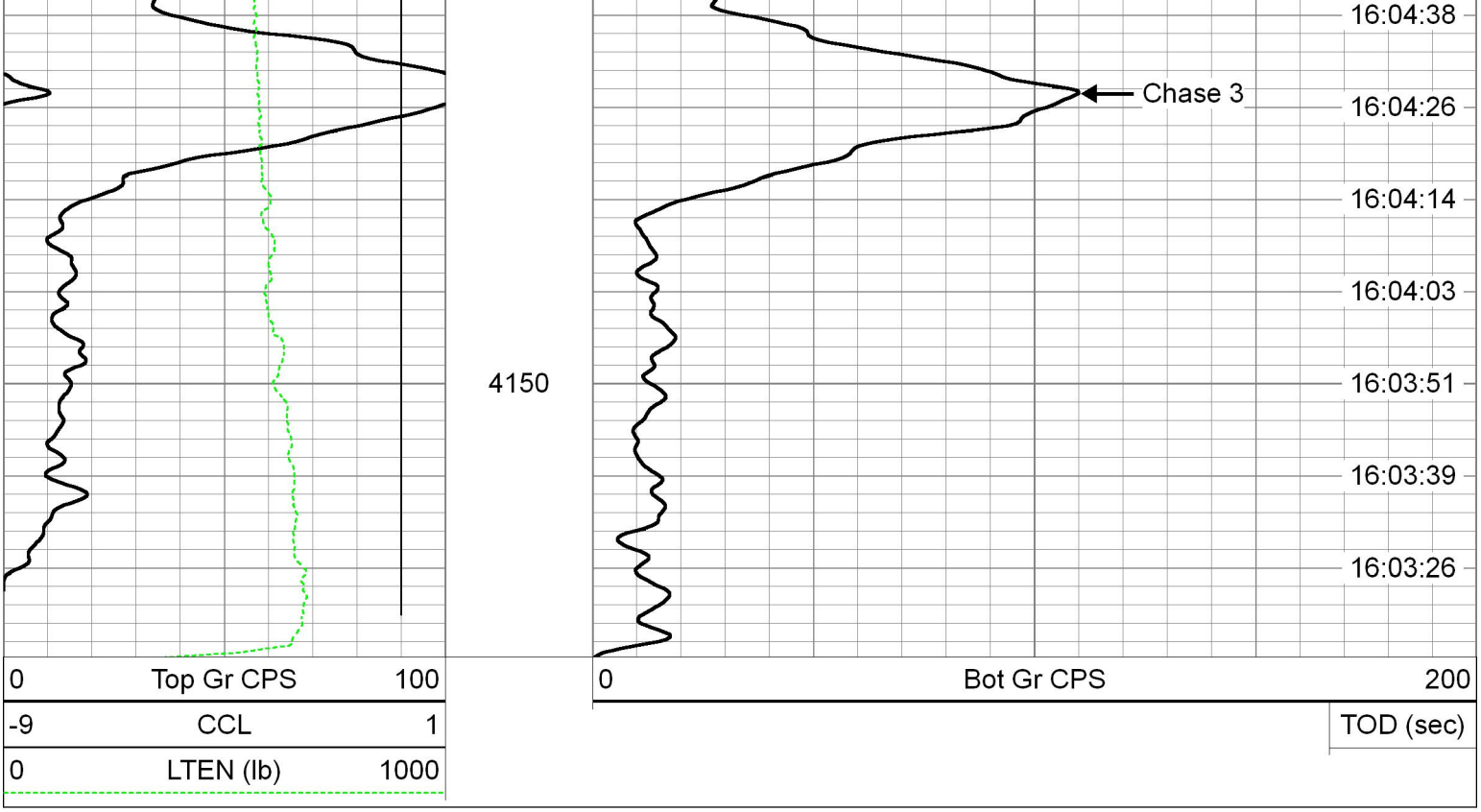
CHASE 3

Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	CHASE3
Presentation Format	tracermwl
Dataset Creation	Tue Aug 06 16:03:14 2024
Charted by	Depth in Feet scaled 1:240




3700
3750
3800
3850
16:12:57
16:12:46
16:12:34
16:12:23
16:12:12
16:12:00
16:11:49
16:11:38
16:11:26
16:11:15
16:11:04
16:10:52
16:10:41
16:10:30
16:10:18
16:10:07
16:09:56
16:09:44
16:09:33
16:09:22
16:09:10
16:08:59


3900
3950
4000
4050
4100
Packer
Btm Of 7" Csg
16:08:48
16:08:36
16:08:25
16:08:14
16:08:02
16:07:51
16:07:39
16:07:28
16:07:17
16:07:05
16:06:54
16:06:43
16:06:31
16:06:20
16:06:09
16:05:57
16:05:46
16:05:35
16:05:23
16:05:12
16:05:00
16:04:49



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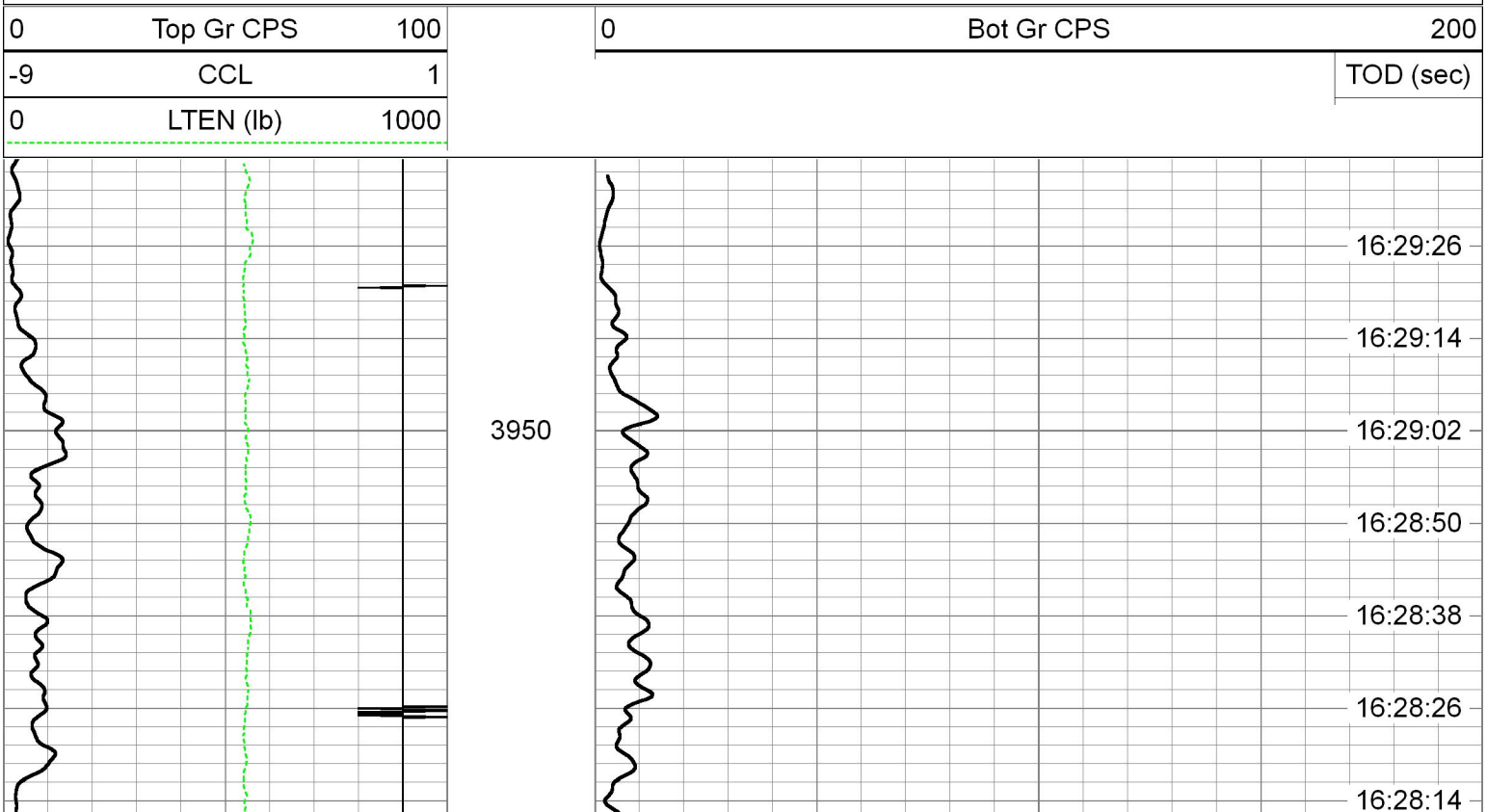
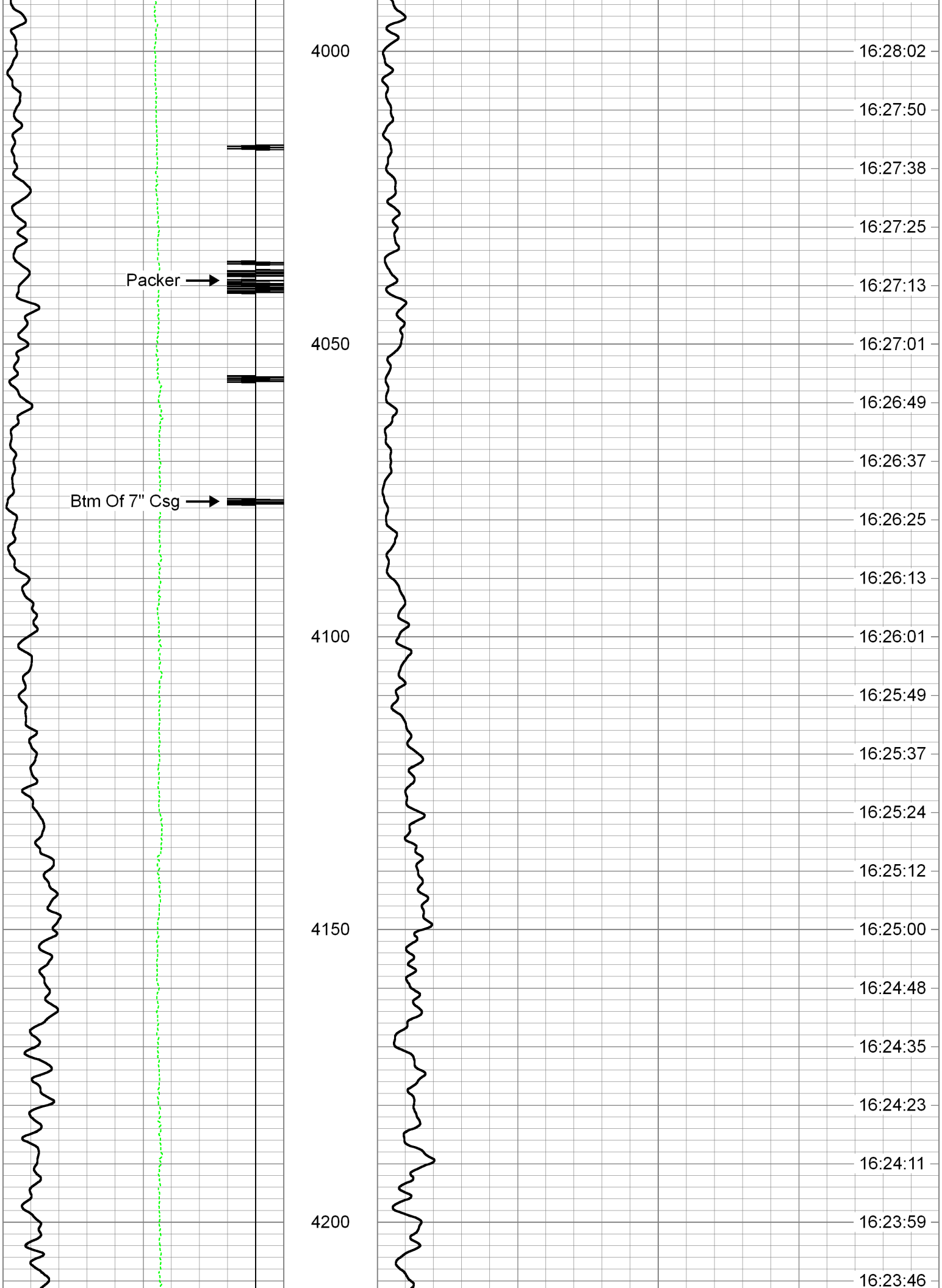
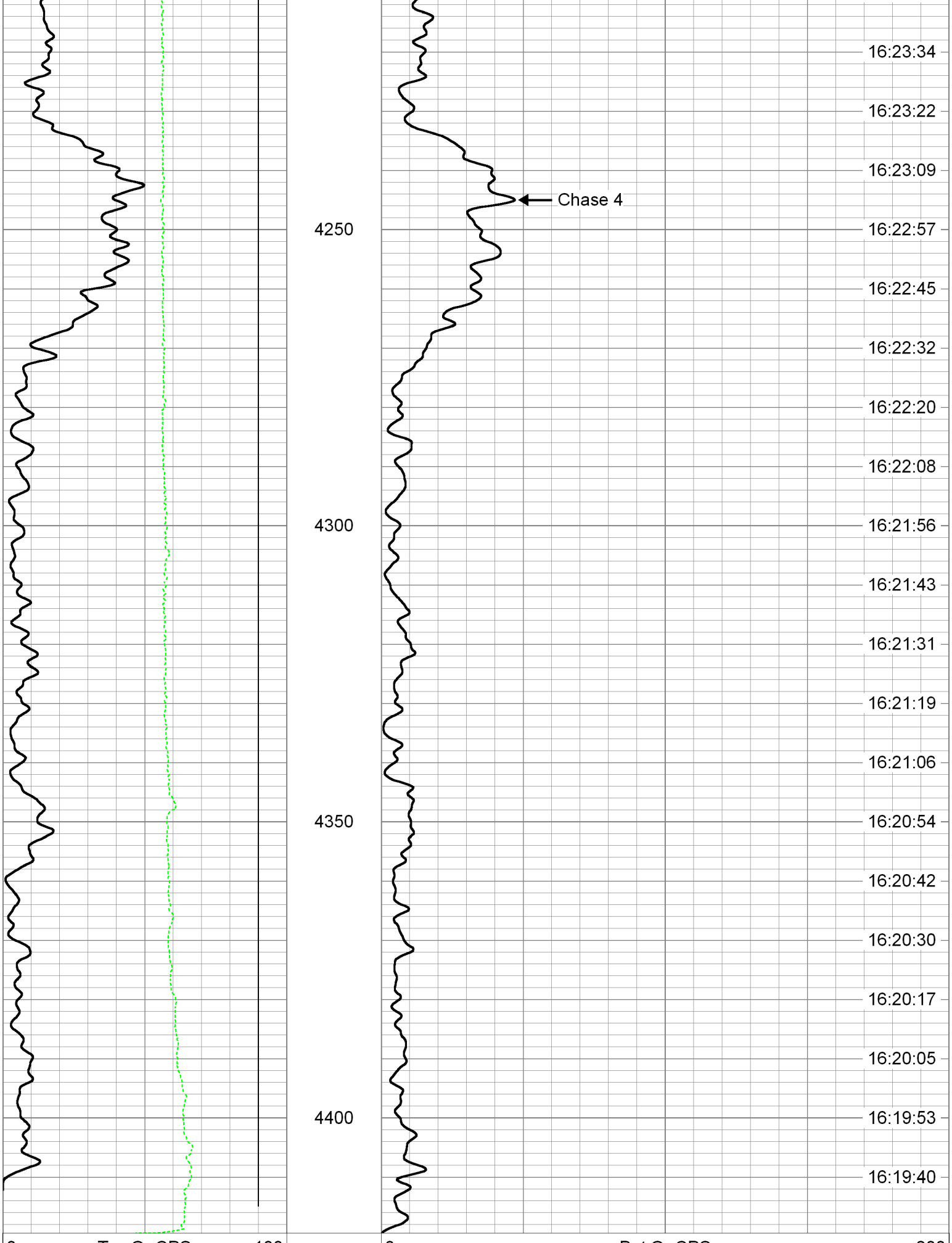
CHASE 4

Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	CHASE4
Presentation Format	tracermwl
Dataset Creation	Tue Aug 06 16:19:27 2024
Charted by	Depth in Feet scaled 1:240




Packer
Btm Of 7" Csg
4000
4050
4100
4150
4200
16:28:02
16:27:50
16:27:38
16:27:25
16:27:13
16:27:01
16:26:49
16:26:37
16:26:25
16:26:13
16:26:01
16:25:49
16:25:37
16:25:24
16:25:12
16:25:00
16:24:48
16:24:35
16:24:23
16:24:11
16:23:59
16:23:46


Chase 4
4250
4300
4350
4400
16:23:34
16:23:22
16:23:09
16:22:57
16:22:45
16:22:32
16:22:20
16:22:08
16:21:56
16:21:43
16:21:31
16:21:19
16:21:06
16:20:54
16:20:42
16:20:30
16:20:17
16:20:05
16:19:53
16:19:40
0
Top Gr CPS
100
0
Bot Gr CPS
200
-9
CCL
1
TOD (sec)

0	LTEN (lb)	1000

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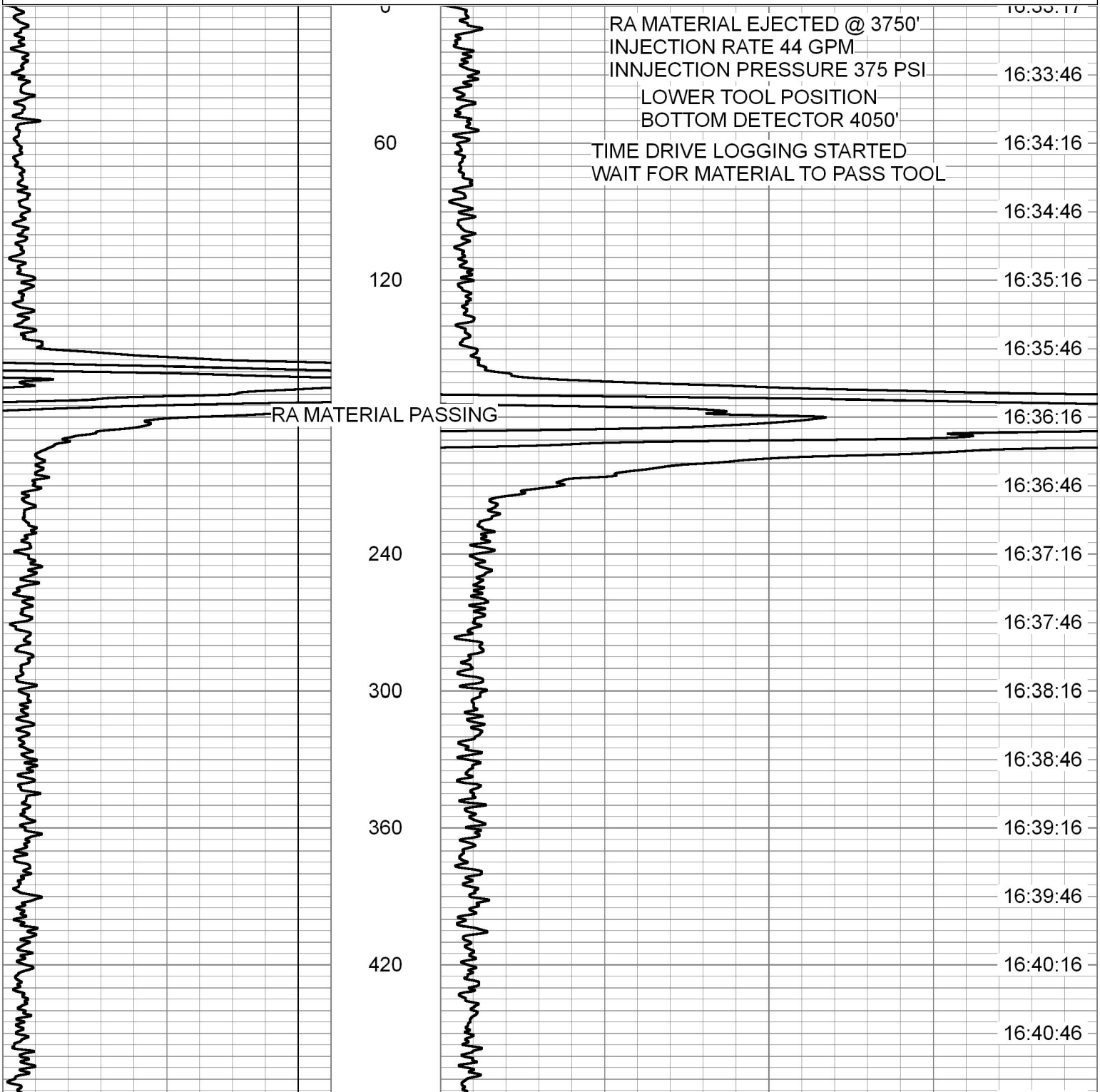
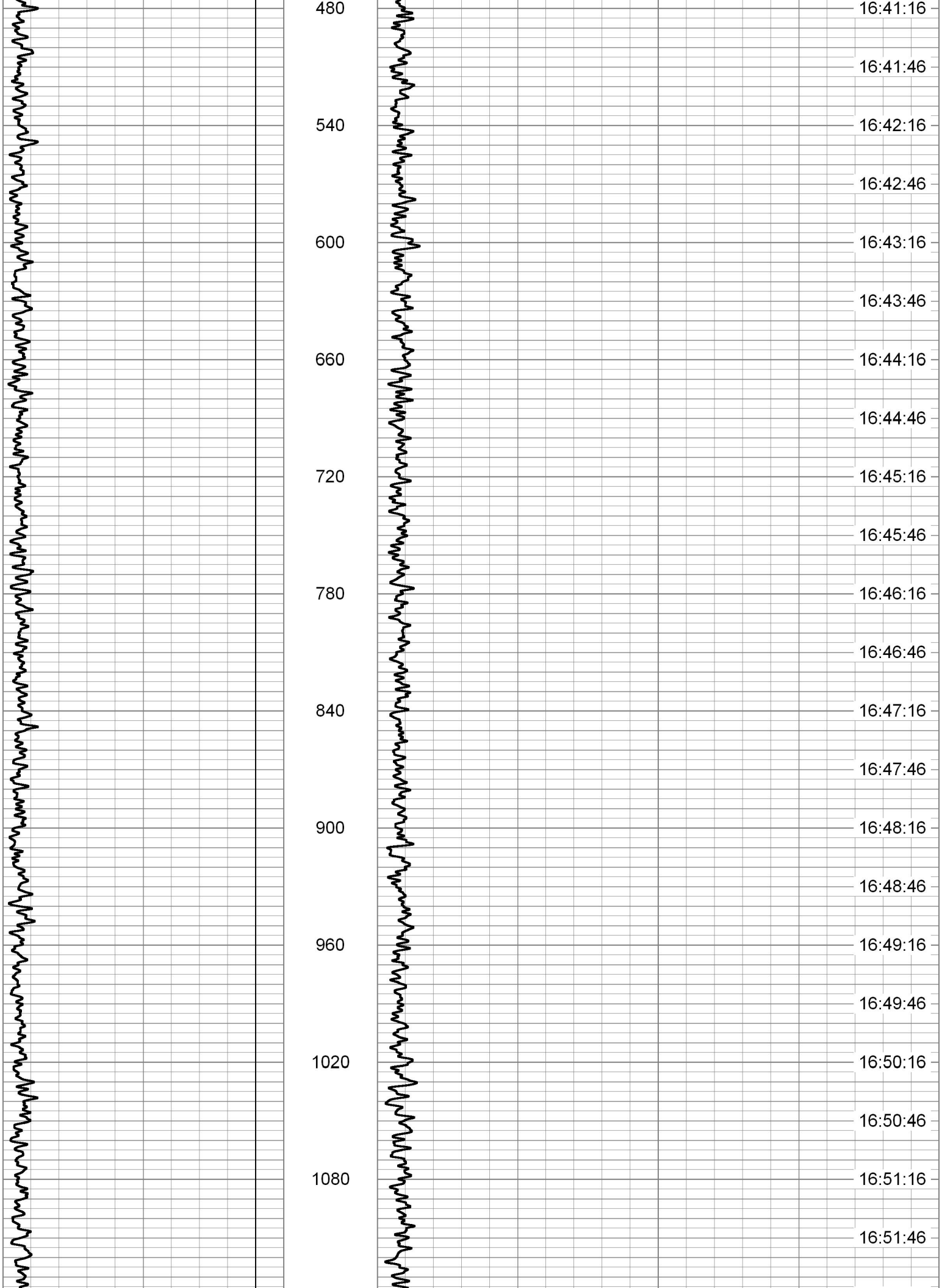
TIME DRIVE SURVEY

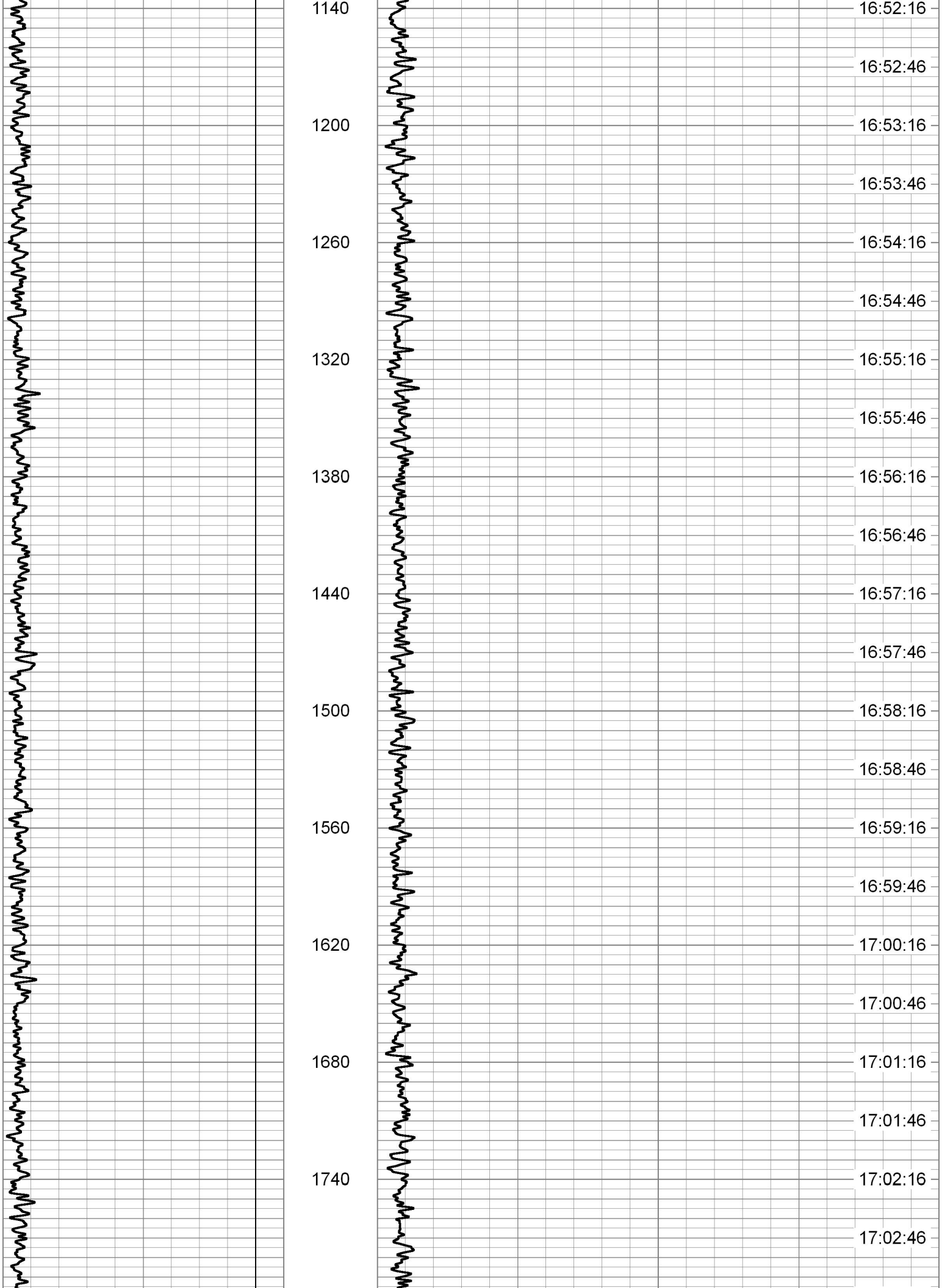
RA MATERIAL EJECTED @ 3750'
INJECTION 44 GPM 375 PSI

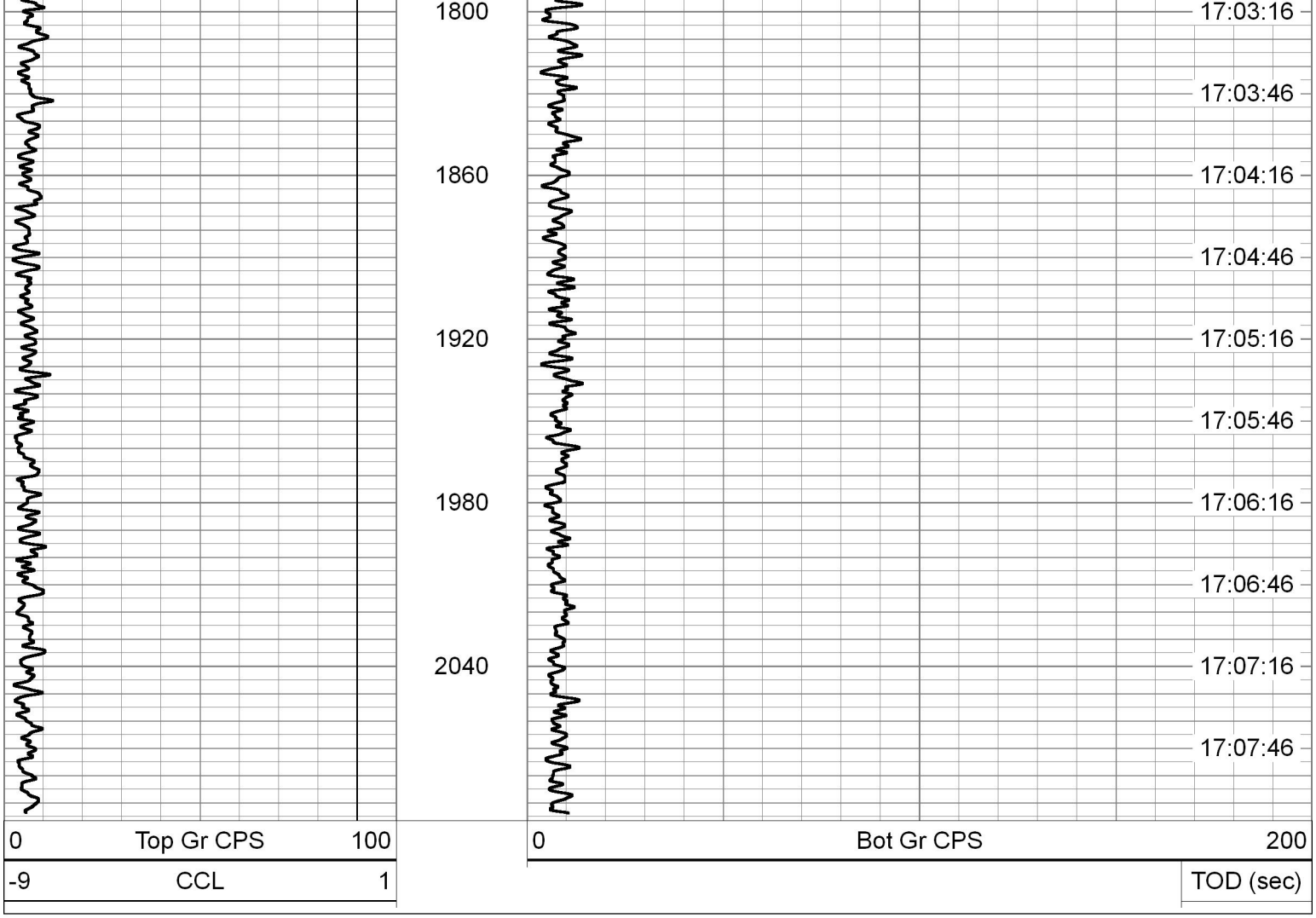
Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	30MIN
Presentation Format	tracer_time_60
Dataset Creation	Tue Aug 06 16:33:17 2024
Charted by	Time scaled 60/hour

0	Top Gr CPS	100	0	Bot Gr CPS	200
-9	CCL	1			TOD (sec)




480
16:41:16
16:41:46
540
16:42:16
16:42:46
600
16:43:16
16:43:46
660
16:44:16
16:44:46
720
16:45:16
16:45:46
780
16:46:16
16:46:46
840
16:47:16
16:47:46
900
16:48:16
16:48:46
960
16:49:16
16:49:46
1020
16:50:16
16:50:46
1080
16:51:16
16:51:46


1140
1200
1260
1320
1380
1440
1500
1560
1620
1680
1740
16:52:16
16:52:46
16:53:16
16:53:46
16:54:16
16:54:46
16:55:16
16:55:46
16:56:16
16:56:46
16:57:16
16:57:46
16:58:16
16:58:46
16:59:16
16:59:46
17:00:16
17:00:46
17:01:16
17:01:46
17:02:16
17:02:46



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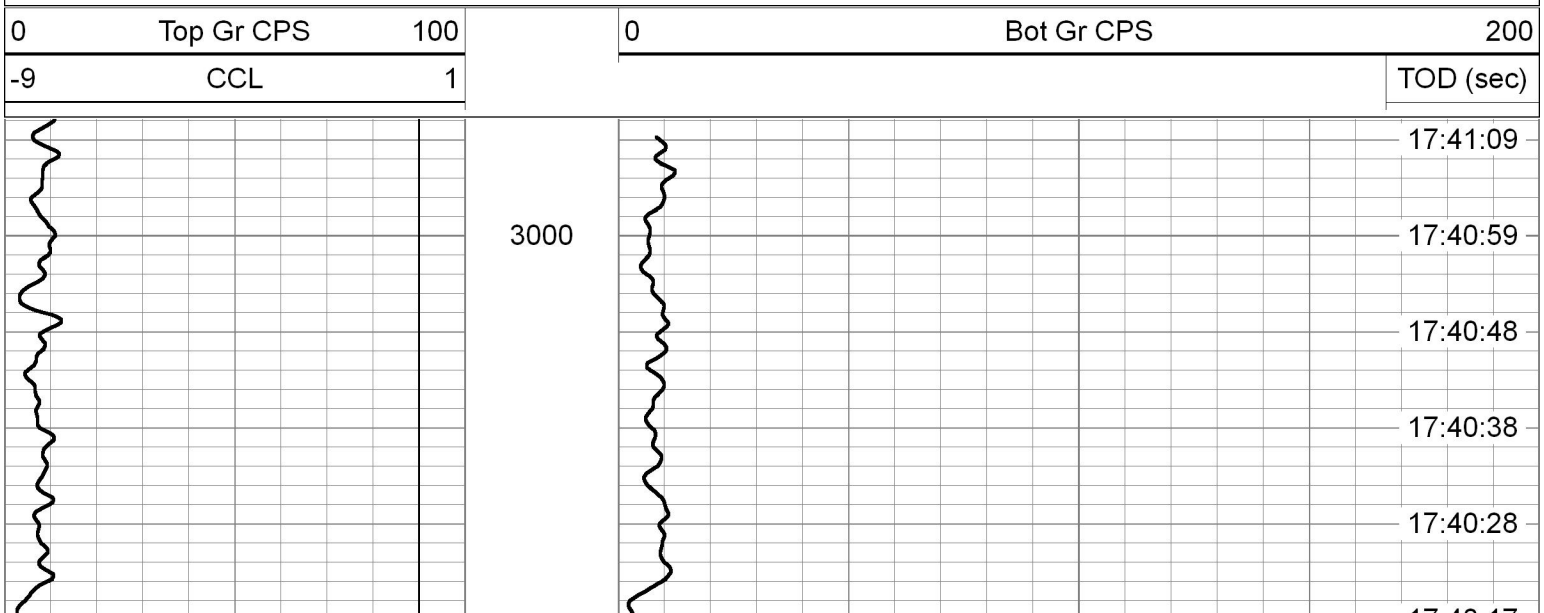
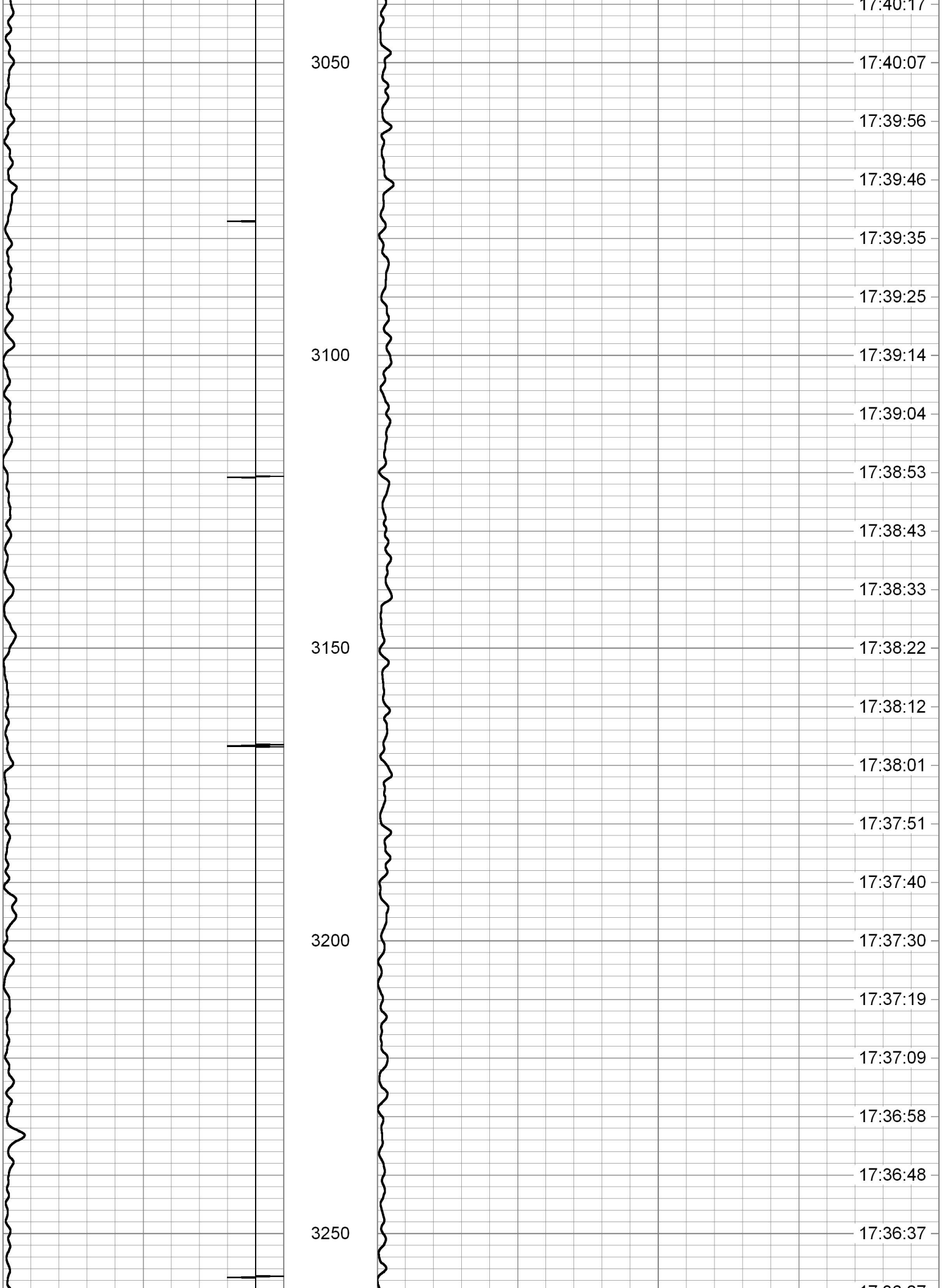
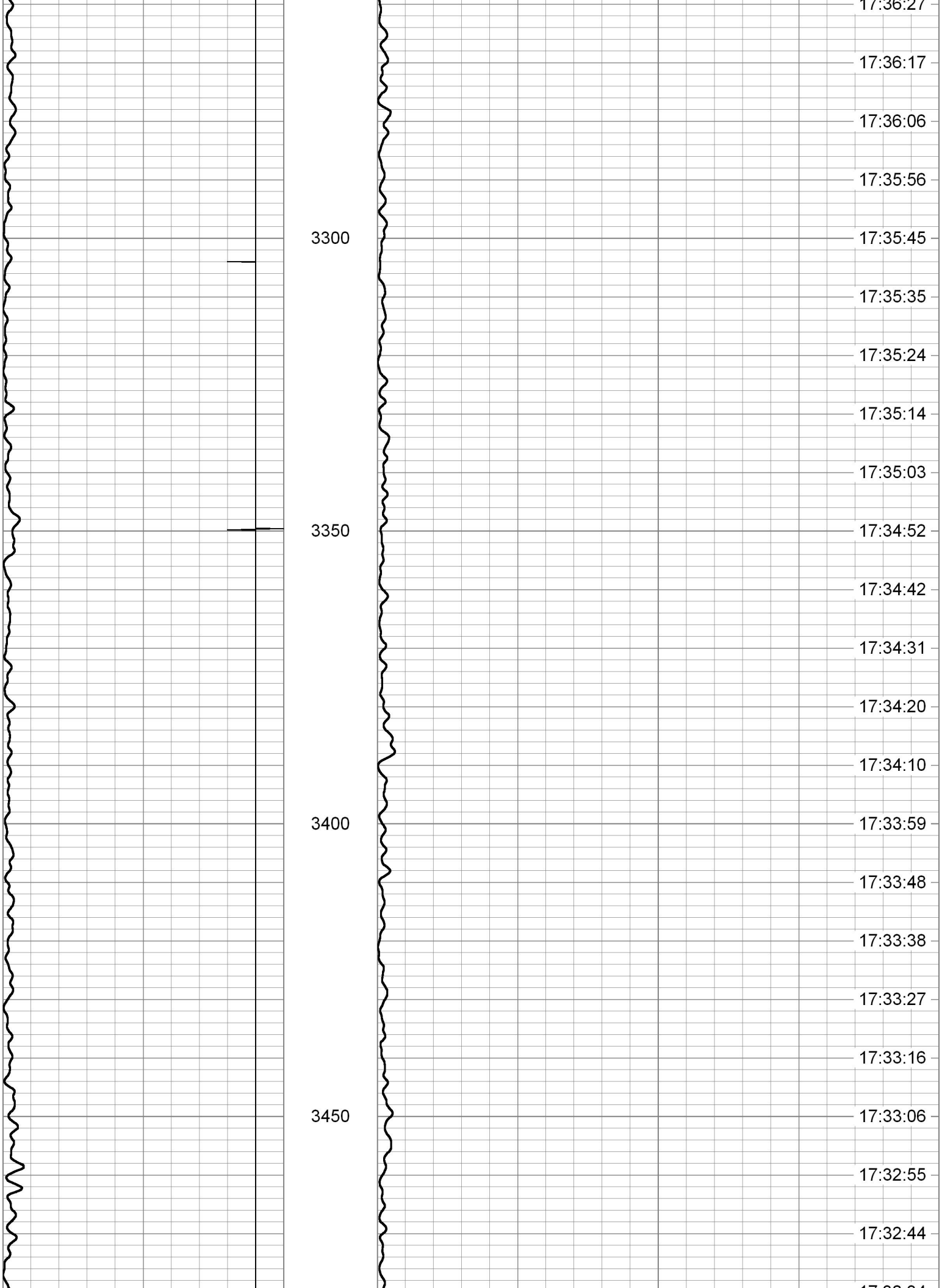
FINAL PASS

Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
Dataset Pathname	FINAL
Presentation Format	tracermwl
Dataset Creation	Tue Aug 06 17:14:43 2024
Charted by	Depth in Feet scaled 1:240




3050
3100
3150
3200
3250
17:40:17
17:40:07
17:39:56
17:39:46
17:39:35
17:39:25
17:39:14
17:39:04
17:38:53
17:38:43
17:38:33
17:38:22
17:38:12
17:38:01
17:37:51
17:37:40
17:37:30
17:37:19
17:37:09
17:36:58
17:36:48
17:36:37


3300
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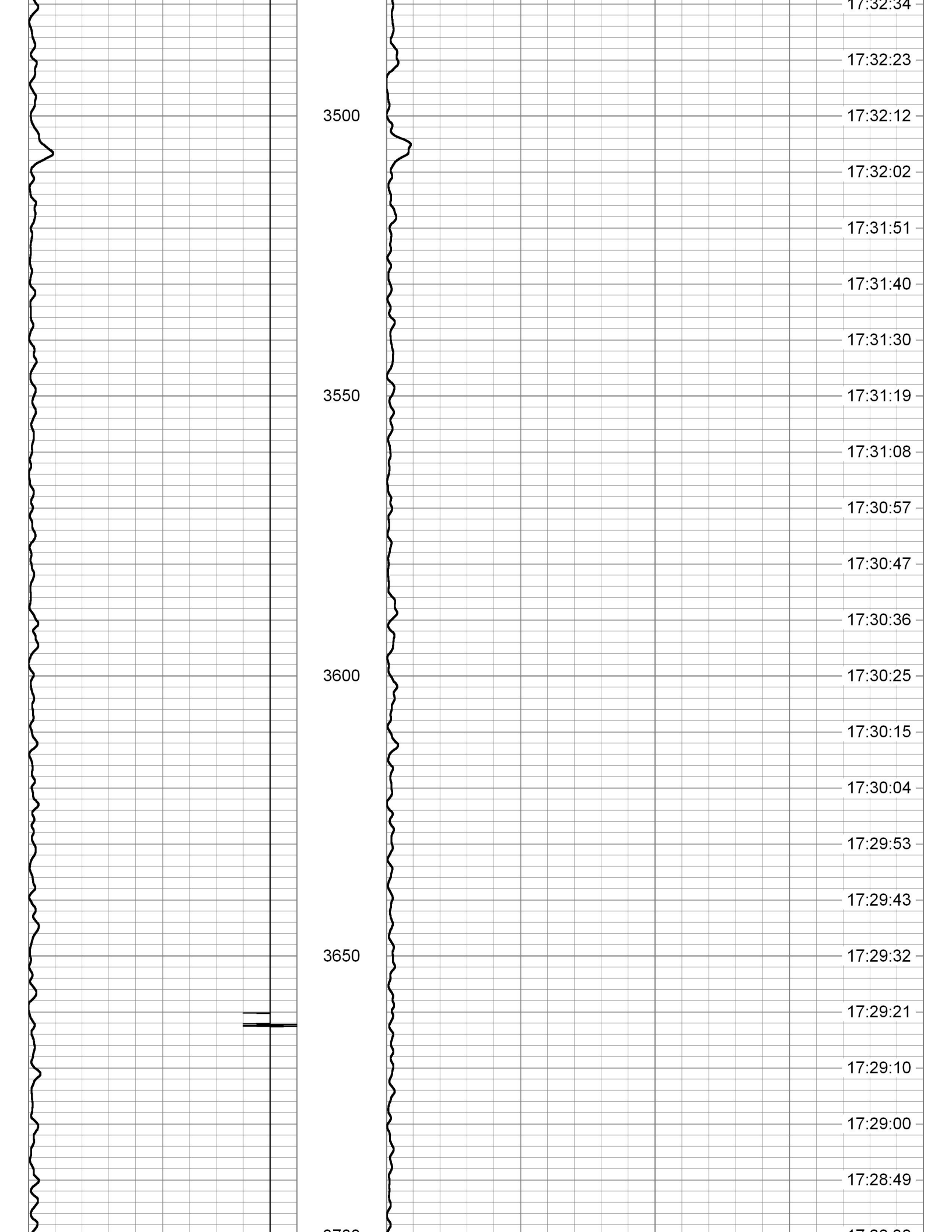
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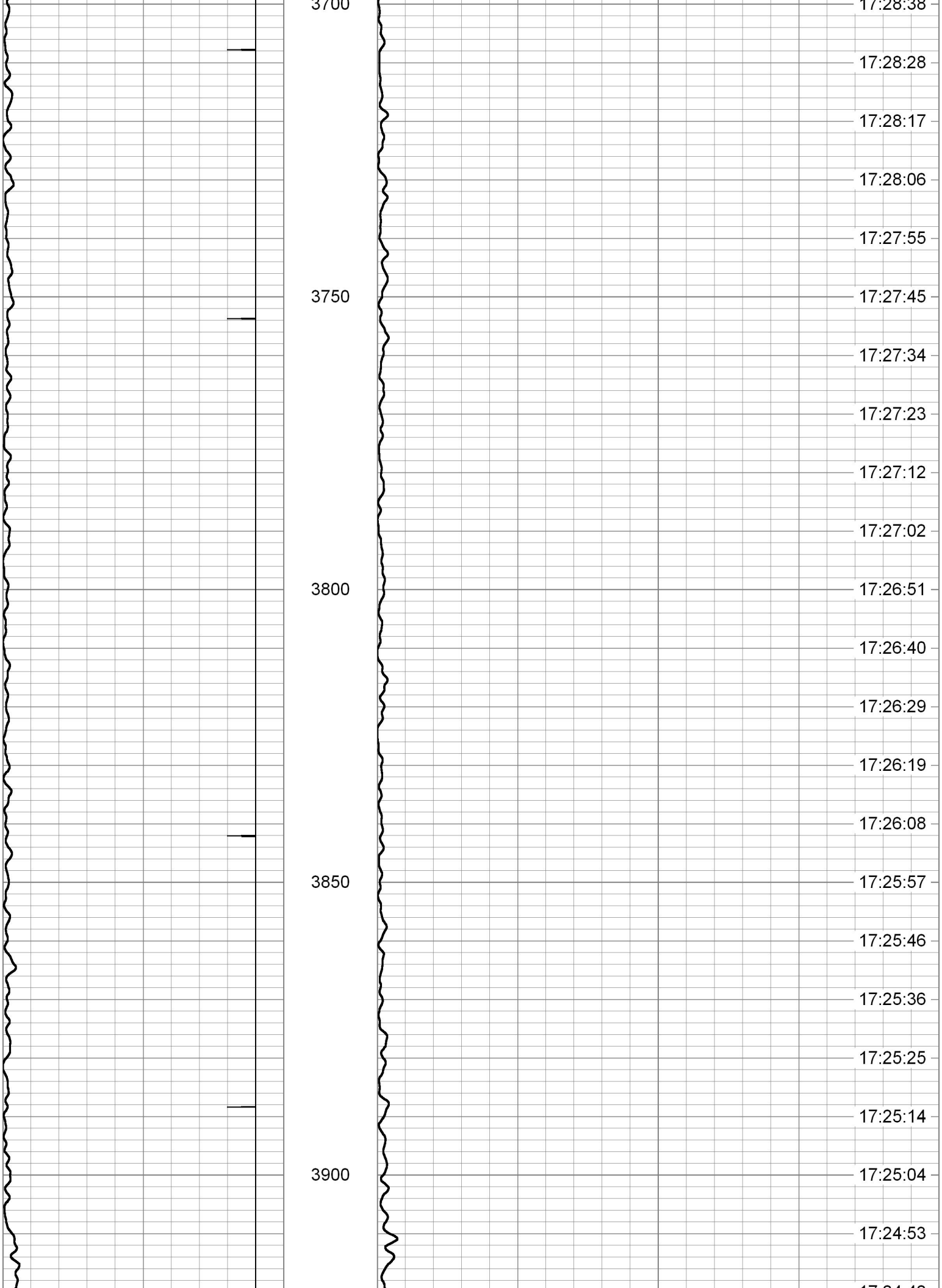
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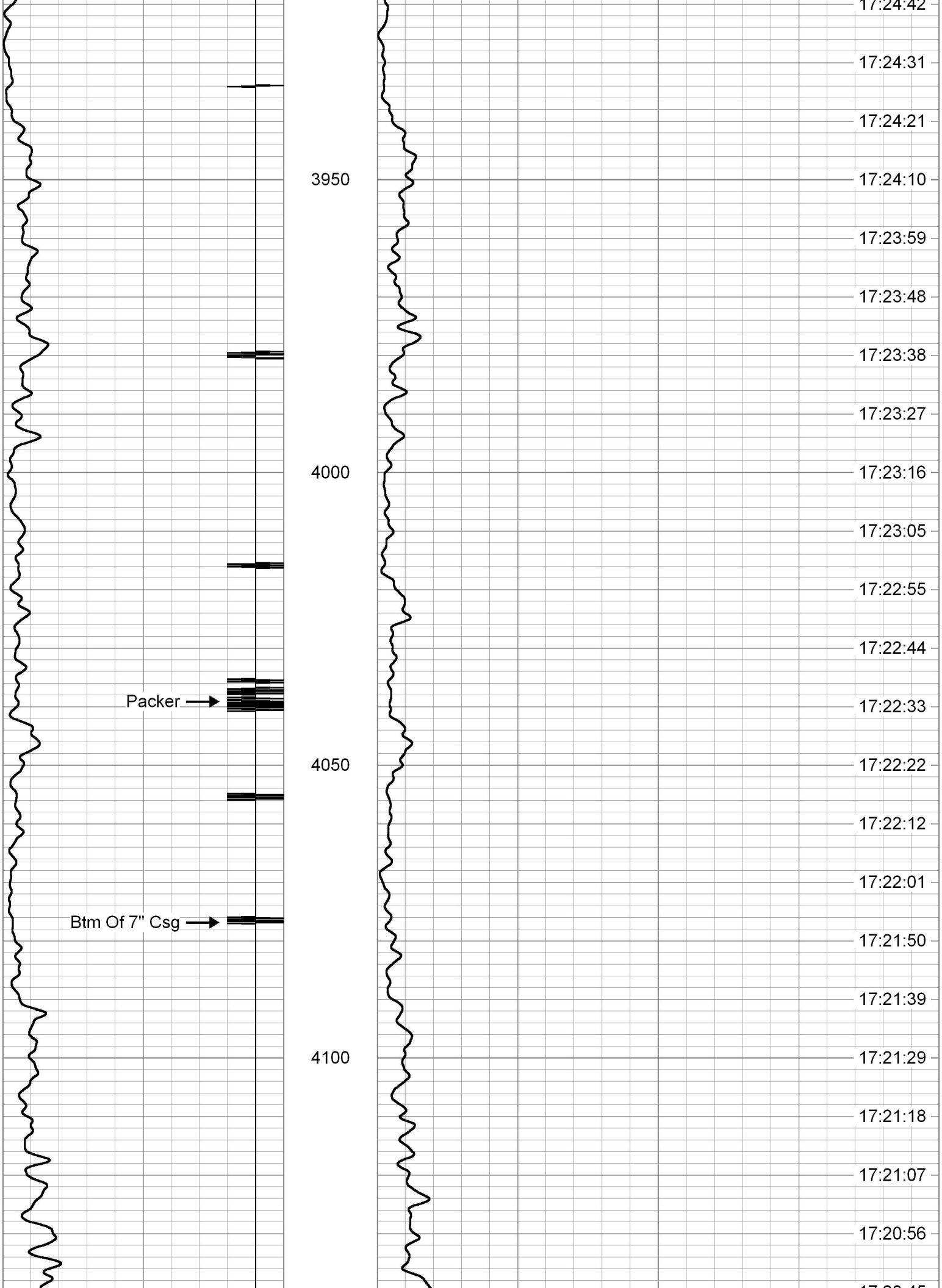
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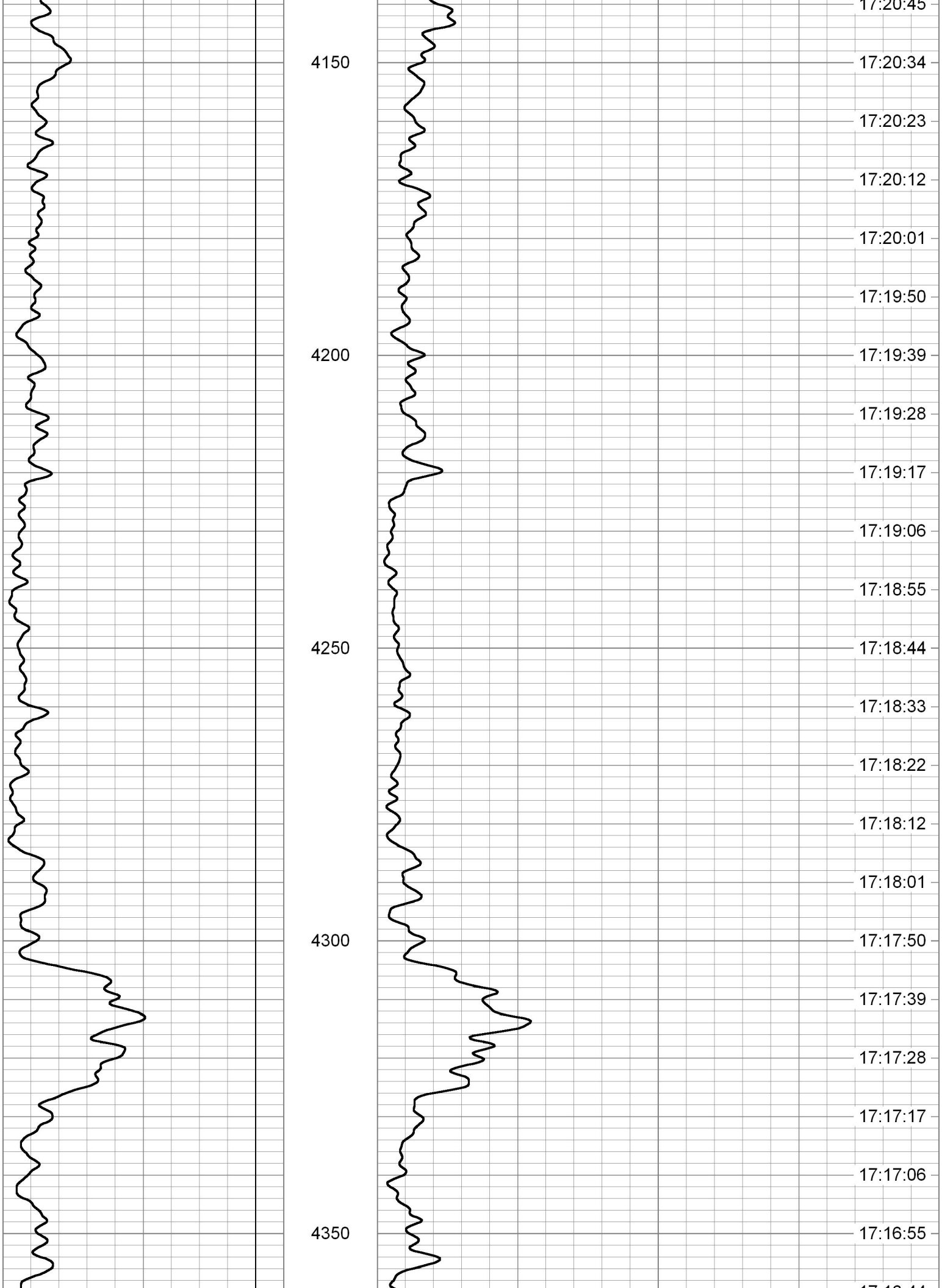
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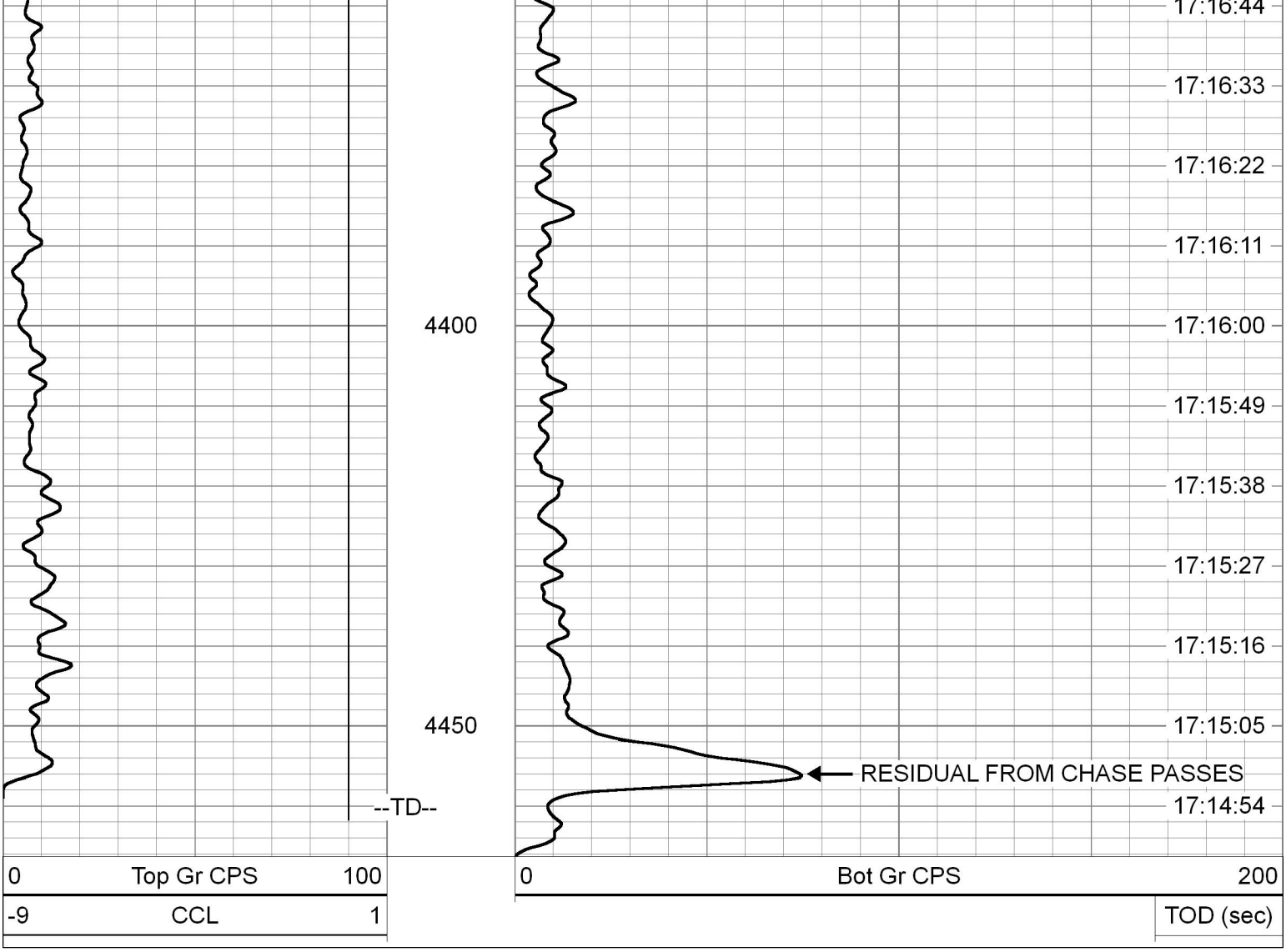

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BASE VS FINAL

Database File	z:\enviromental geotech technologies\romulus storage\egt #1-12\2024\republic1_12_2024.db
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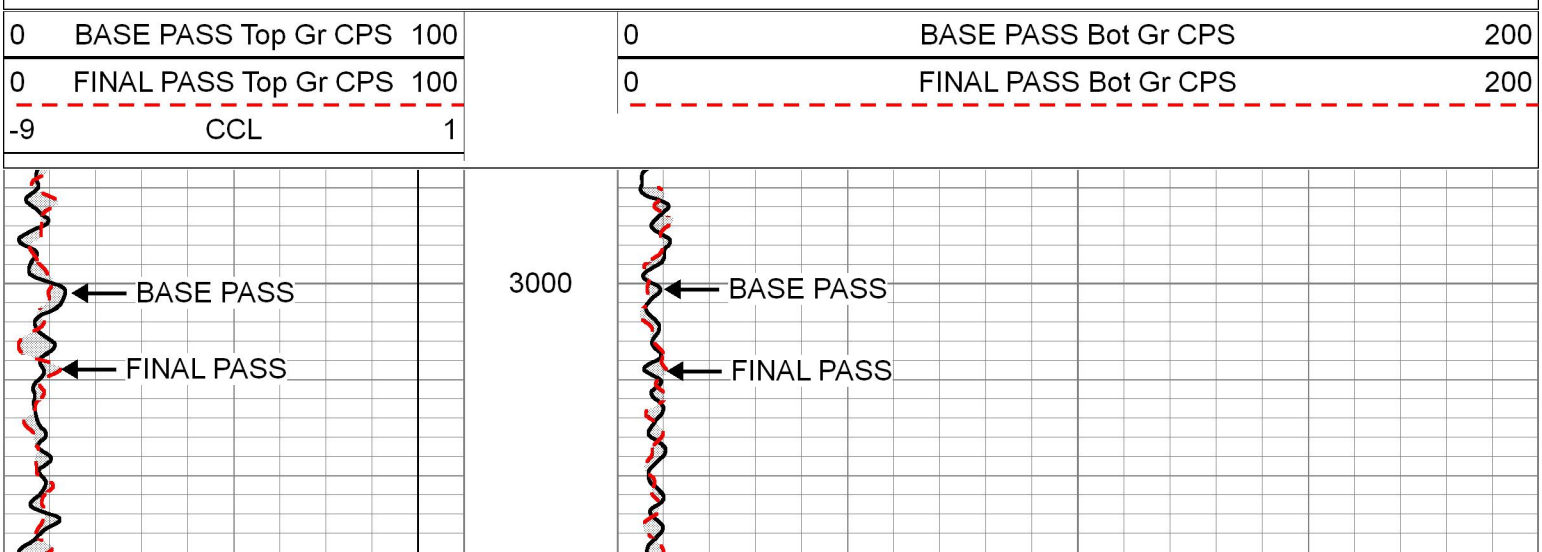
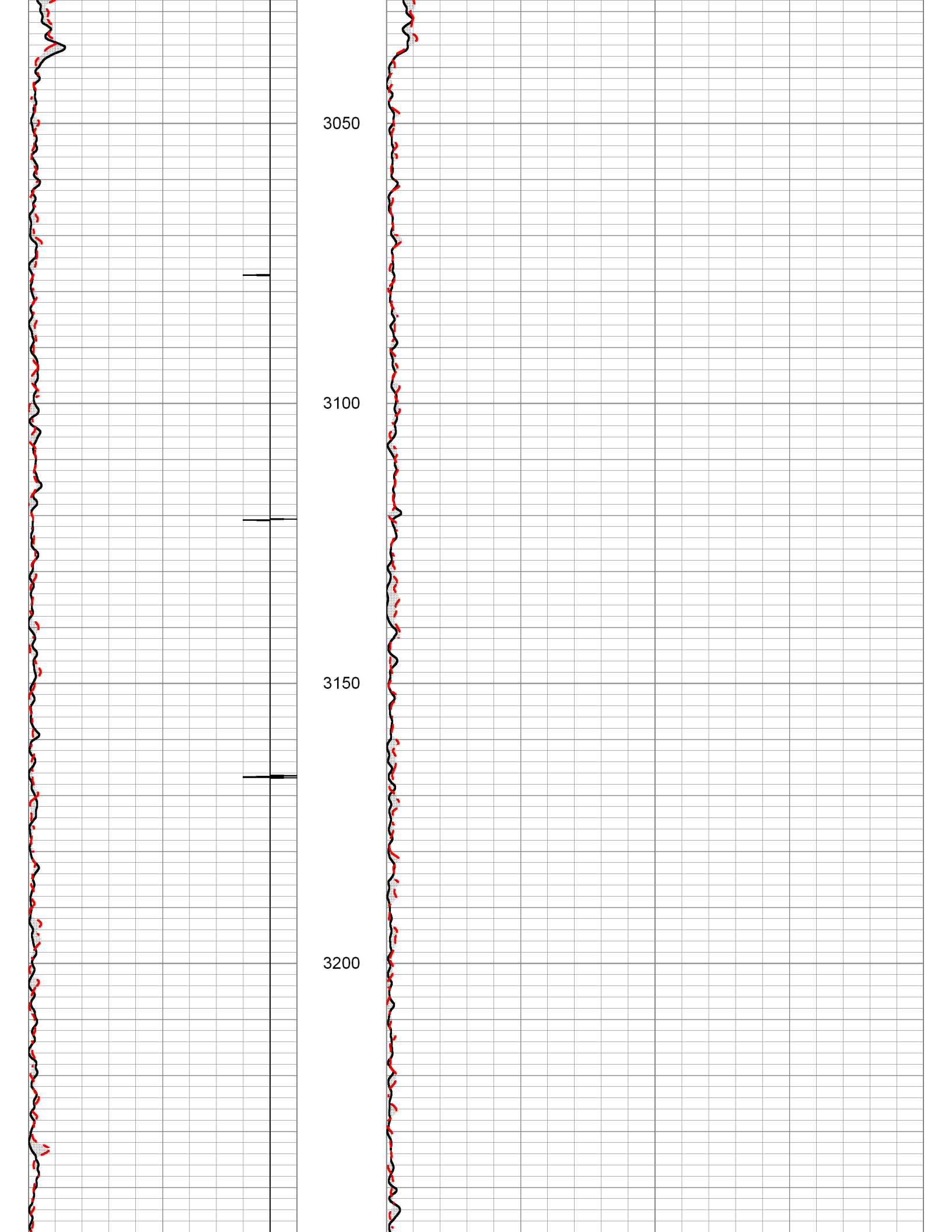
Presentation Format	tracer_final_vs_base
Dataset Creation	Tue Aug 06 17:41:38 2024
Charted by	Depth in Feet scaled 1:240

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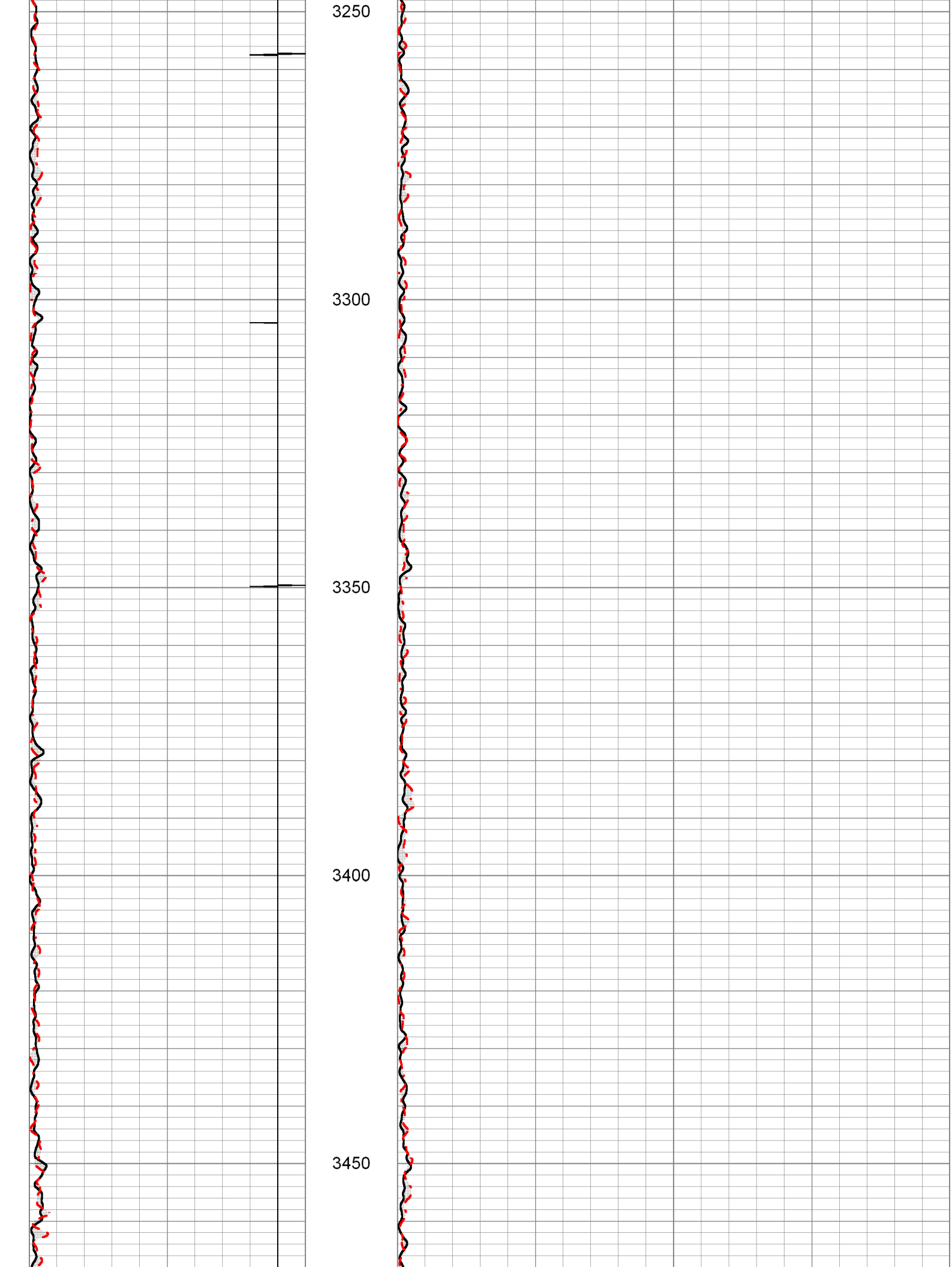
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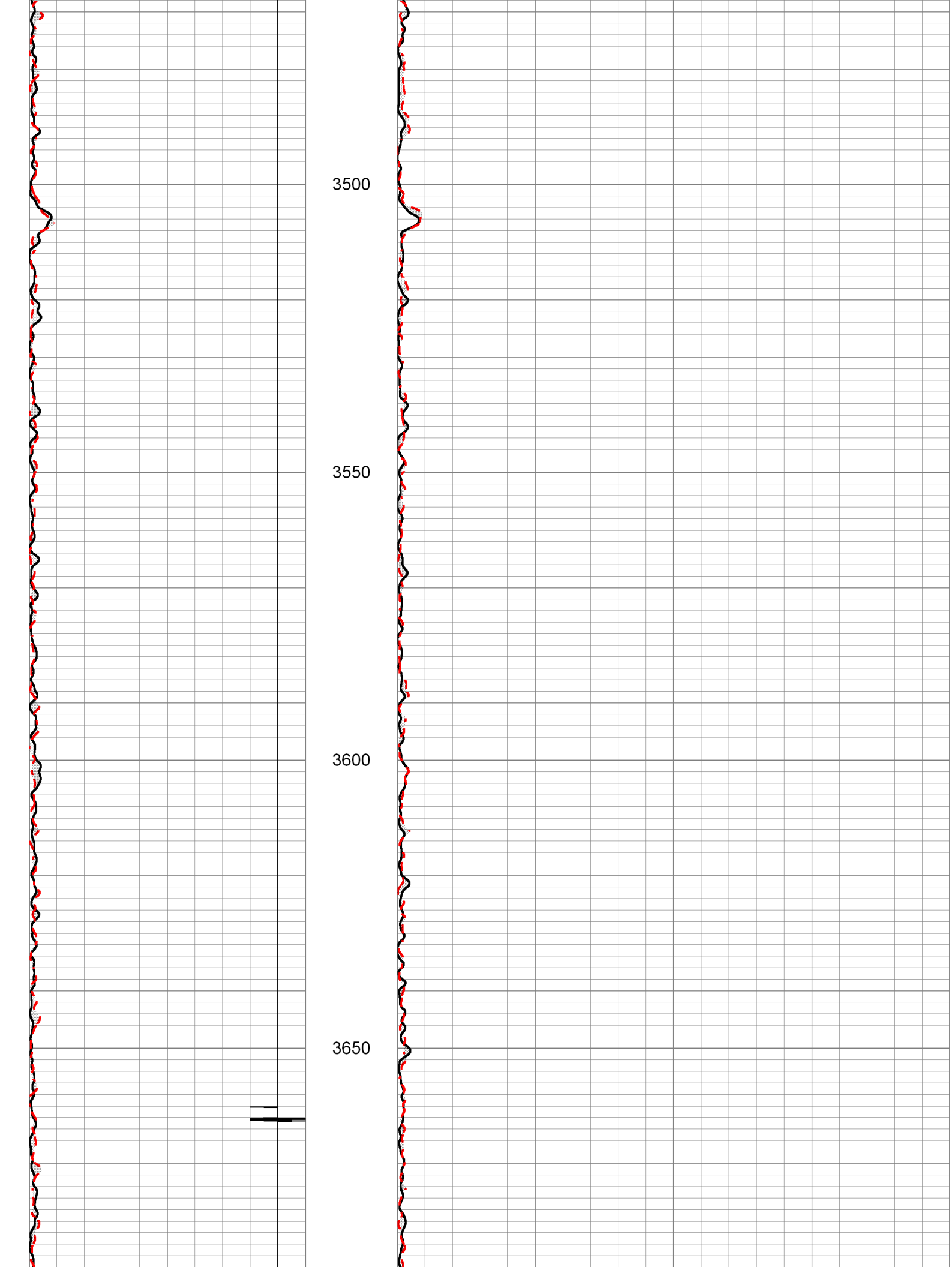
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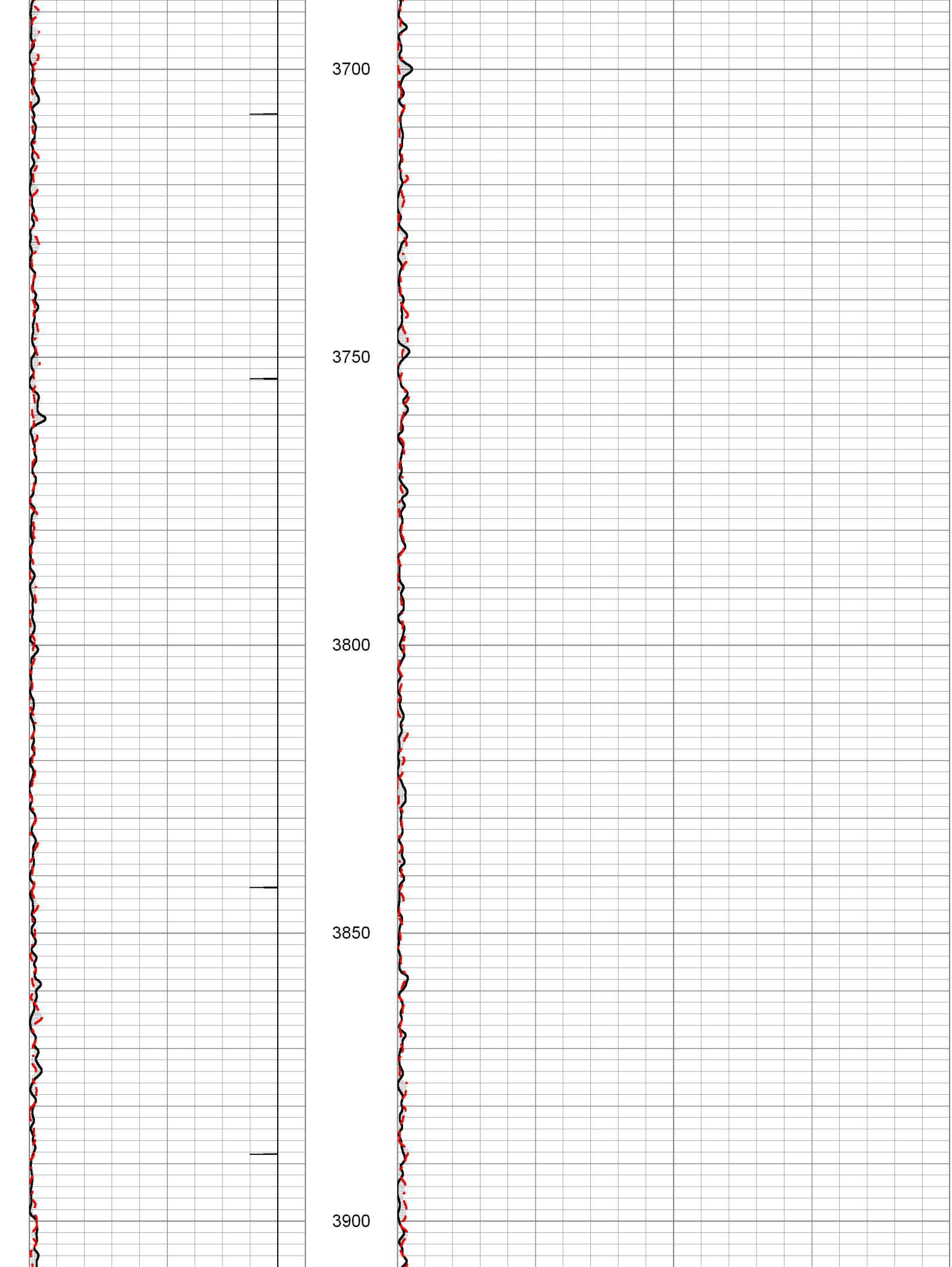
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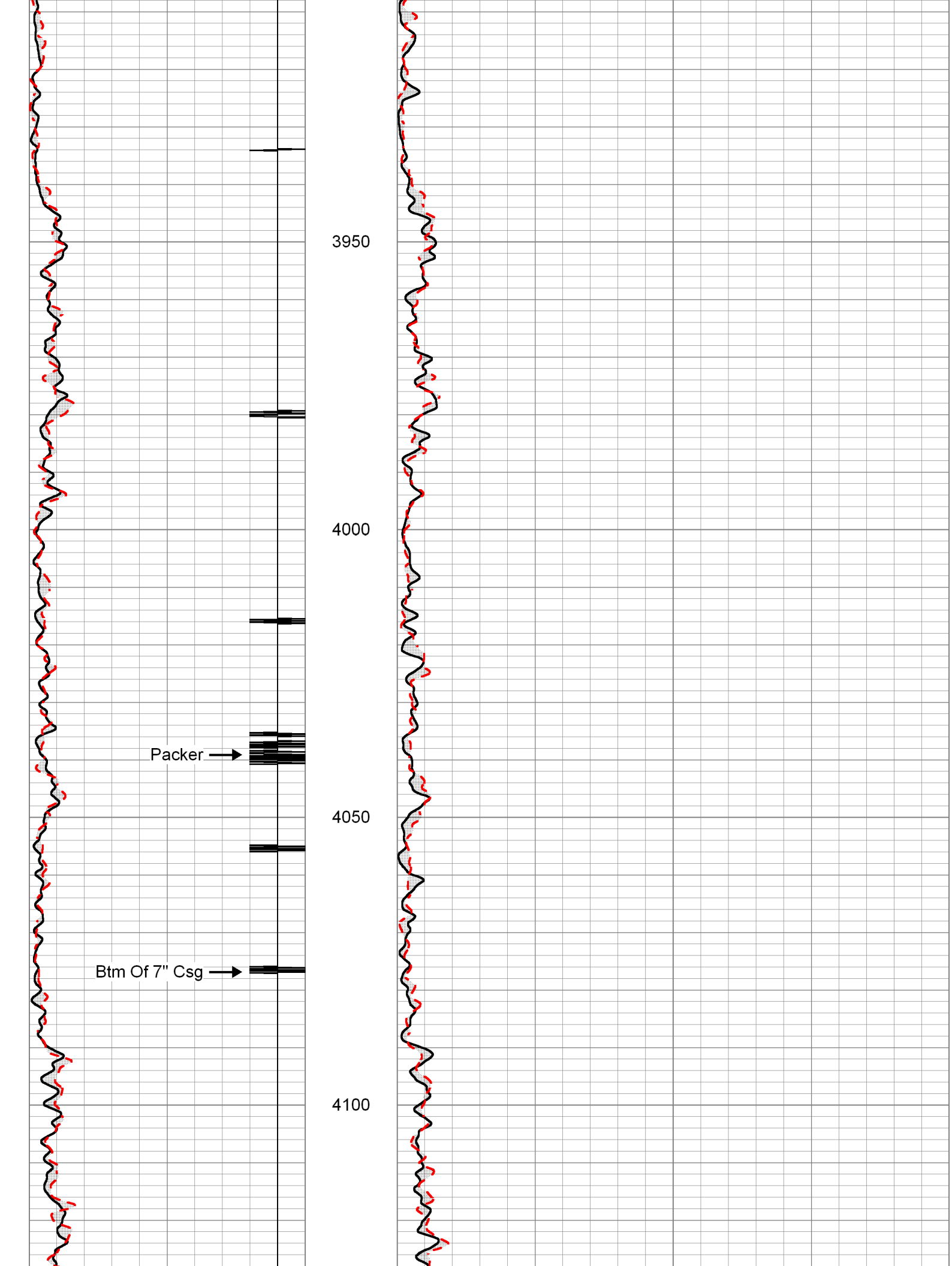
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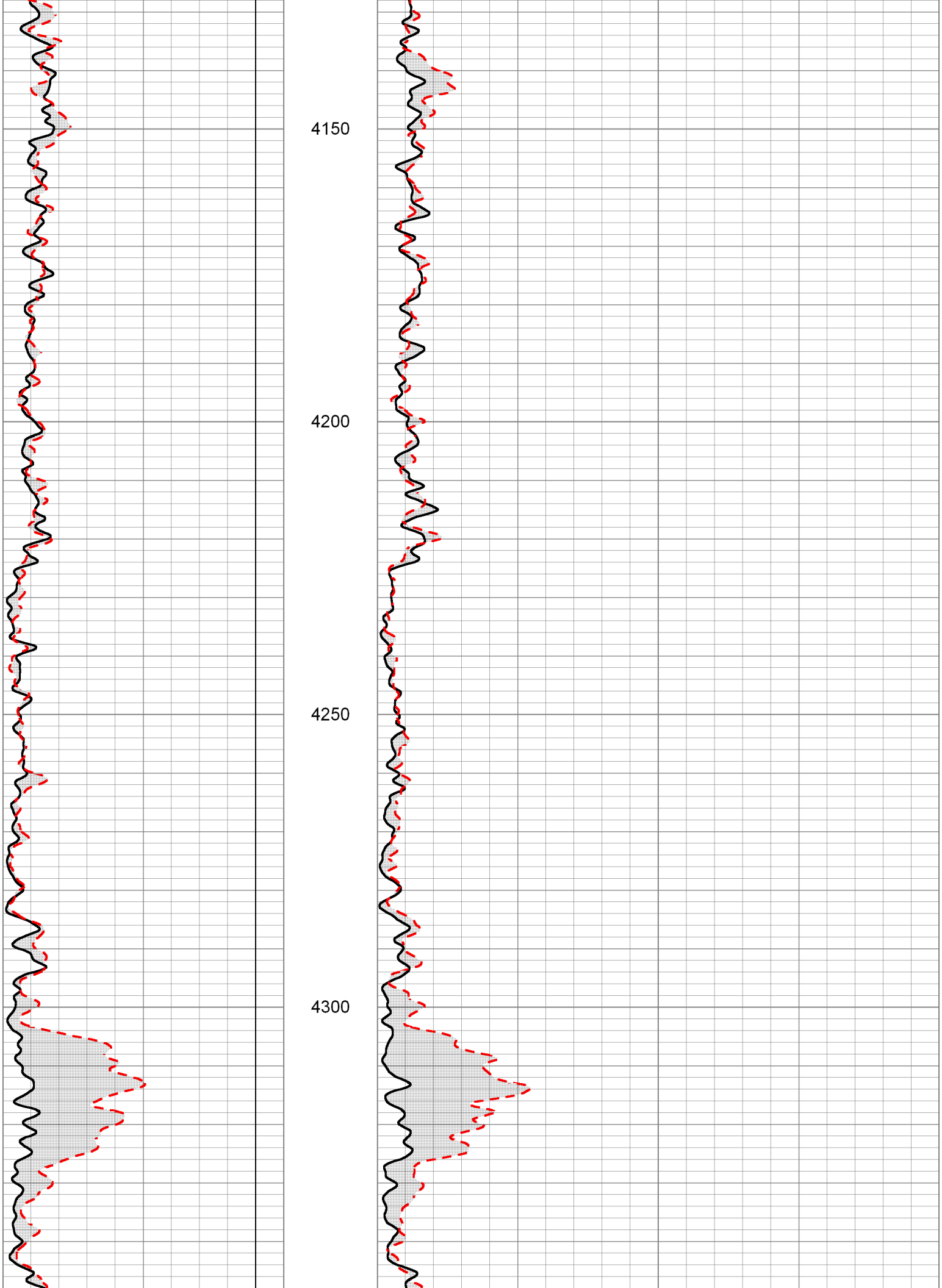
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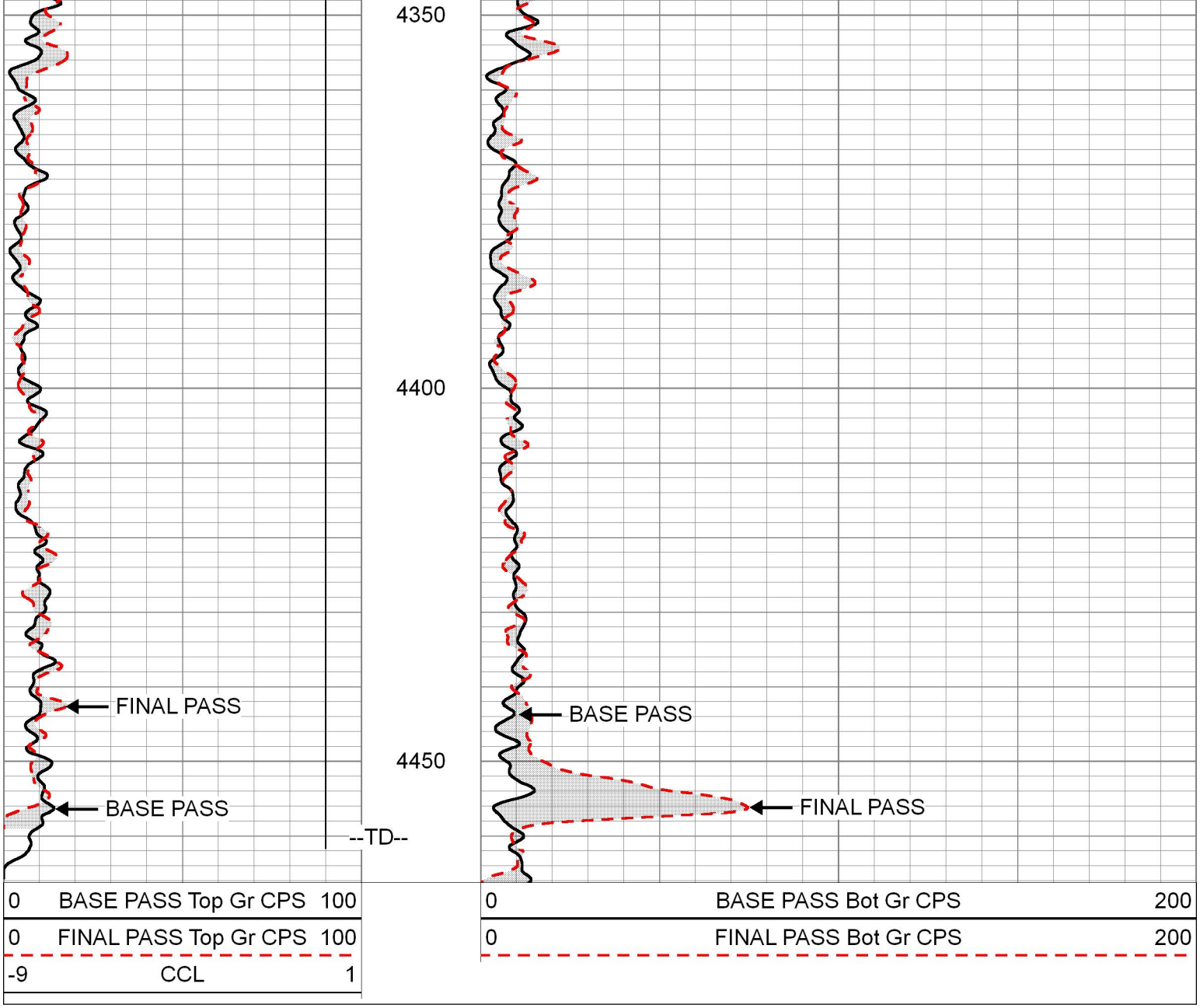
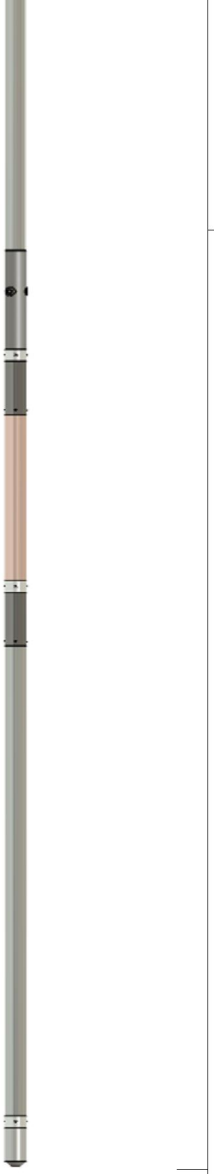


Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			TREJCT-COMPROBE_MID (0004) Comprobe Ejector DO NOT EXCEED 100ma	0.08	1.38	25.00
DET$2	9.73					

			TRDET-COMPROBE_MID_NO_BAR_SHORT (0006) Comprobe Middle Ejector no spacer bar Ejector 73.6125 from bottom	13.15	1.38	10.00
CCL	4.50					
DET$1	1.00					
LOCTIM	0.00					

Dataset:	republic1_12_2024.db: field/well/run1/BASE
Total length:	13.23 ft
Total weight:	35.00 lb
O.D.:	1.38 in

ATTACHMENTS

ATTACHMENT 1

RAW PRESSURE AND TEMPERATURE DATA FROM FALLOFF AND STATIC PRESSURE GRADIENT (08-08-24 - 08-09-24)

ATTACHMENT 2

WELL 1-12 RAT SURVEY – 4 CHASE PASSES (08-06-24).LAS

ATTACHMENT 3

WELL 1-12 RAT SURVEY - TIME-DRIVE (08-06-24).LAS

ATTACHMENT 4

WELL 1-12 RAT SURVEY - BASE_FINAL PASSES (08-06-24).LAS