

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-095-02598 County Tyler District Meade
Quad Middlebourne 7.5' Pad Name Sine Field/Pool Name ----
Farm name James Sine ET AL Well Number Garmin Unit 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4362854m Easting 503696m
Landing Point of Curve Northing 4363191m Easting 504426m
Bottom Hole Northing 4367576m Easting 502593m

Elevation (ft) 799' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Air - Foam & 4% KCL
Mud - Polymer

Date permit issued 3/27/2019 Date drilling commenced 1/22/2020 Date drilling ceased 5/27/2020
Date completion activities began 9/7/2020 Date completion activities ceased 10/13/2020
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 42' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1269, 1274' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 154, 278' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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APPROVED

Reviewed by:
[Signature]
05/19/2023
3/27/23

API 47- 095 - 02598 Farm name James Sine ET AL Well number Garmin Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	28"	20"	110'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	391'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2696'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	22462'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6349'		4.7#, P-110		
Packer type and depth set		N/A					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	284 sx	15.6	1.20	341	0'	8 Hrs.
Surface	Class A	405 sx	15.8	1.17	474	0'	8 Hrs.
Coal							
Intermediate 1	Class A	920 sx	15.8	1.17	1076	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	4012 sx (Tail)	13.5 (Lead), 15.2(Tail)	1.16 (Tail)	4654	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 22462' MD, 6035' TVD (BHL), 6096' (Deepest Point Drilled) Loggers TD (ft) 22462' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

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Kick off depth (ft) 5649'

Check all wireline logs run caliper density deviated/directional induction temperature
 neutron resistivity gamma ray temperature

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

Conductor - 0
 Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface
 Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface
 Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED N/A

05/19/2023
3/17/23

LATITUDE 39°25'00"

11,463'

LATITUDE 39°27'30"

LONGITUDE 80°57'30"

564' LONGITUDE 80°55'00"

1H TOP HOLE

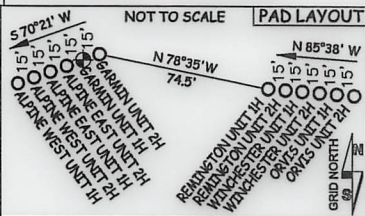
3,305' TO BOTTOM HOLE

1H BOTTOM HOLE

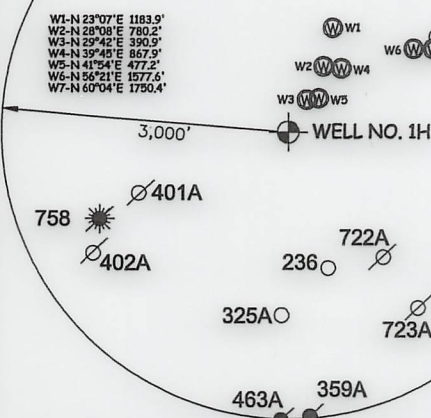
NOTE: NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

AS DRILLED DATA: WELL 1H TOP HOLE INFORMATION: N: 336,644ft E: 1,588,302ft LAT: 39°24'54.43" LON: 80°57'26.06" BOTTOM HOLE INFORMATION: N: 352,200ft E: 1,584,941ft LAT: 39°27'27.63" LON: 80°58'12.13" WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS: WELL 1H TOP HOLE INFORMATION: N: 4,362,854m E: 503,696m BOTTOM HOLE INFORMATION: N: 4,367,576m E: 502,593m



NOTE: 7 WATER WELLS WERE LOCATED WITHIN 2000' OF CENTER OF PAD

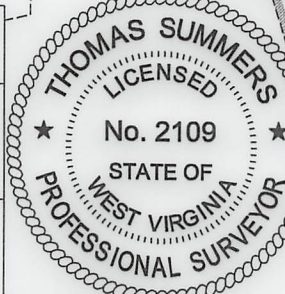


I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415



JOB # 17-004WA DRAWING # GARMIN1H830AD SCALE 1" = 2000' MINIMUM DEGREE OF ACCURACY SUBMETER PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND: Surface Owner Boundary Lines +/- Interior Surface Tracts +/- Proposed Well Path As Drilled Well Path

THOMAS SUMMERS P.S. 2109

DATE 01/19/21

OPERATOR'S WELL# GARMIN UNIT #1H

WELL 1H POINT OF ENTRY INFORMATION: N: 337,430ft E: 1,589,956ft LAT: 39°25'02.46" LON: 80°57'05.16" (NAD) 83 (UTM) ZONE 17 COORDS: N: 4,363,102m E: 504,195m

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL 47 095 02598 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X LOCATION: ELEVATION 799' - AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK QUADRANGLE MIDDLEBOURNE 7.5 DISTRICT MEADE COUNTY TYPED SURFACE OWNER JAMES SINE ET AL ACREAGE 32.395 ACRES +/- LEASE ACREAGE 54.74 AC±; 140 AC±; 9.40 AC±; OIL & GAS ROYALTY OWNER JAMES SINE ET UX; ROBERT S. CARSE ET UX; JASON L. GREATHOUSE; DAVID E. BOWYER; DAVID W. JUDGE; DAVID L. STEVENS ET UX; MAXINE GUMM; JAMES M. UTT; ROGER L. STEVENS ET UX; ALLIANCE PETROLEUM CORP.; 1.236 AC±; 13.15 AC±; 32 AC±; 66 AC±; 204.88 AC±; 60 AC±; 40 AC±; AMY B. PARIS; ERIC T. ANDERSON; CHARLOTTE M. ADAMS; GEORGE ALLAN EDDY; JEFFEREY D. GORRELL; ALFRED EDWARD TUTTLE ET AL; 98 AC±; 53.33 AC±; 165.25 AC±; 5.66 AC±; 5.67 AC±; 138.56 AC±; EDWIN EARNEST WEBER JR. ET UX; HAROLD E. ANDREWS ET UX; JOSHUA BOTKINS 100.5 AC±; 25.413 AC±; 96 AC±; PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,035' TVD 22,462' MD WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

05/19/2023

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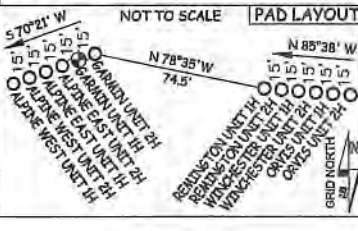
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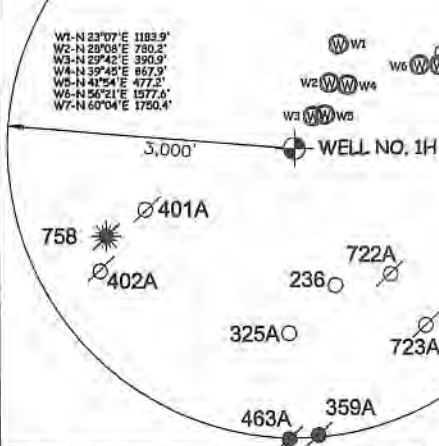
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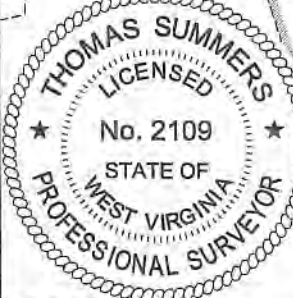


NOTE: 7 WATER WELLS WERE LOCATED WITHIN 2000' OF CENTER OF PAD



Antero Resources Corporation Well No. Garmin Unit 1H

A - SURFACE - RAYMOND L. MOORE D.B. 285 PG. 310 T.M. 08 PAR. 29.1 1.10 AC. ± A - LEASE - RAYMOND L. MOORE ET UX B - SURFACE - DESTRY B. NELSON ET AL D.B. 347 PG. 643 T.M. 08 PAR. 28.1 1,236 AC. ± B - LEASE - DAVID E. BOWYER C1, C2, C3 - SURFACE - DONALD R. ROBINSON ET AL D.B. 294 PG. 713 T.M. 08 PAR. 28 8,914 AC. ± C1 - LEASE - LILLIAN LEE EDDY C2 - LEASE - DONALD E. ROBINSON ET UX C3 - LEASE - EARL G. GLENDENNING



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SM 3/12/23

API 47-095-02598 Farm Name James Sine ET AL Well Number Garmin Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/7/2020	22343		60	Marcellus
2	9/7/2020	22256.7765	22077.659	60	Marcellus
3	9/8/2020	22003.21198	21824.0945	60	Marcellus
4	9/9/2020	21749.64747	21570.53	60	Marcellus
5	9/9/2020	21496.08295	21316.9654	60	Marcellus
6	9/10/2020	21242.51843	21063.4009	60	Marcellus
7	9/10/2020	20988.95392	20809.8364	60	Marcellus
8	9/11/2020	20735.3894	20556.2719	60	Marcellus
9	9/11/2020	20481.82488	20302.7074	60	Marcellus
10	9/12/2020	20228.26037	20049.1429	60	Marcellus
11	9/13/2020	19974.69585	19795.5783	60	Marcellus
12	9/13/2020	19721.13134	19542.0138	60	Marcellus
13	9/14/2020	19467.56682	19288.4493	60	Marcellus
14	9/14/2020	19214.0023	19034.8848	60	Marcellus
15	9/15/2020	18960.43779	18781.3203	60	Marcellus
16	9/15/2020	18706.87327	18527.7558	60	Marcellus
17	9/16/2020	18453.30876	18274.1912	60	Marcellus
18	9/16/2020	18199.74424	18020.6267	60	Marcellus
19	9/16/2020	17946.17972	17767.0622	60	Marcellus
20	9/17/2020	17692.61521	17513.4977	60	Marcellus
21	9/17/2020	17439.05069	17259.9332	60	Marcellus
22	9/17/2020	17185.48618	17006.3687	60	Marcellus
23	9/18/2020	16931.92166	16752.8041	60	Marcellus
24	9/18/2020	16678.35714	16499.2396	60	Marcellus
25	9/18/2020	16424.79263	16245.6751	60	Marcellus
26	9/19/2020	16171.22811	15992.1106	60	Marcellus
27	9/19/2020	15917.66359	15738.5461	60	Marcellus
28	9/19/2020	15664.09908	15484.9816	60	Marcellus
29	9/20/2020	15410.53456	15231.4171	60	Marcellus
30	9/20/2020	15156.97005	14977.8525	60	Marcellus
31	9/21/2020	14903.40553	14724.288	60	Marcellus
32	9/21/2020	14649.84101	14470.7235	60	Marcellus
33	9/21/2020	14396.2765	14217.159	60	Marcellus
34	9/22/2020	14142.71198	13963.5945	60	Marcellus
35	9/22/2020	13889.14747	13710.03	60	Marcellus
36	9/22/2020	13635.58295	13456.4654	60	Marcellus
37	9/23/2020	13382.01843	13202.9009	60	Marcellus
38	9/23/2020	13128.45392	12949.3364	60	Marcellus
39	9/23/2020	12874.8894	12695.7719	60	Marcellus
40	9/24/2020	12621.32488	12442.2074	60	Marcellus
41	9/24/2020	12367.76037	12188.6429	60	Marcellus
42	9/24/2020	12114.19585	11935.0783	60	Marcellus
43	9/25/2020	11860.63134	11681.5138	60	Marcellus
44	9/25/2020	11607.06682	11427.9493	60	Marcellus
45	9/25/2020	11353.5023	11174.3848	60	Marcellus
46	9/26/2020	11099.93779	10920.8203	60	Marcellus
47	9/26/2020	10846.37327	10667.2558	60	Marcellus
48	9/26/2020	10592.80876	10413.6912	60	Marcellus
49	9/26/2020	10339.24424	10160.1267	60	Marcellus
50	9/27/2020	10085.67972	9906.56221	60	Marcellus
51	9/27/2020	9832.115207	9652.9977	60	Marcellus
52	9/27/2020	9578.550691	9399.43318	60	Marcellus
53	9/28/2020	9324.986175	9145.86866	60	Marcellus
54	9/28/2020	9071.421659	8892.30415	60	Marcellus
55	9/28/2020	8817.857143	8638.73963	60	Marcellus
56	9/28/2020	8564.292627	8385.17512	60	Marcellus
57	9/29/2020	8310.728111	8131.6106	60	Marcellus
58	9/29/2020	8057.163594	7878.04608	60	Marcellus
59	9/29/2020	7803.599078	7624.48157	60	Marcellus
60	9/30/2020	7550.034562	7370.91705	60	Marcellus
61	9/30/2020	7296.470046	7117.35253	60	Marcellus
62	9/30/2020	7042.90553	6863.78802	60	Marcellus
63	9/30/2020	6789.341014	6610.2235	60	Marcellus

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EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	9/7/2020	88	10075	6485	2693.01	189310	5905.524	N/A
2	9/7/2020	89.07	10659	5282	2738.69	501460	11585.57	N/A
3	9/8/2020	88.45	9727	5940	2995.13	527310	10096.74	N/A
4	9/9/2020	95.57	10038	5402	3073.19	522850	9714.976	N/A
5	9/9/2020	85.91	9003	5830	3502.49	525580	10002.95	N/A
6	9/10/2020	97.06	10152	5898	3440.4	526237	9960.833	N/A
7	9/10/2020	95.04	9895	5321	3241.14	525550	9796	N/A
8	9/11/2020	90.98	9479	5233	3549.94	524489	12348.45	N/A
9	9/11/2020	98.67	10200	4613	3320.95	524850	9798.786	N/A
10	9/12/2020	94.52	9863	5425	3506.88	525100	9691.405	N/A
11	9/13/2020	94.18	9797	6002	3498.21	526580	9733.524	N/A
12	9/13/2020	93.21	9626	5509	3539.65	527125	9782.833	N/A
13	9/14/2020	96.31	9766	4615	3506.38	528095	9678.071	N/A
14	9/14/2020	89.79	8948	5472	3490.65	526460	10414.4	N/A
15	9/15/2020	92.08	9231	5473	3430.65	526420	9584.643	N/A
16	9/15/2020	99.08	9592	9335	3595.55	525670	9547.857	N/A
17	9/16/2020	97.76	9797	5729	3351.82	524870	9483.786	N/A
18	9/16/2020	97.5	9894	6111	3436.41	524700	9568.81	N/A
19	9/16/2020	96.21	9562	6182	3654	525600	9400.381	N/A
20	9/17/2020	94.49	9079	5678	3685	525400	9396.786	N/A
21	9/17/2020	95.06	9081	5576	3722.66	503020	9022.905	N/A
22	9/17/2020	94.2	9026	5637	3559.84	525770	9264.81	N/A
23	9/18/2020	95.15	9017	5599	3777.83	526860	9324.786	N/A
24	9/18/2020	96.08	9118	5877	3666.38	526327	9417.405	N/A
25	9/18/2020	93.44	9031	5932	3300.41	526810	9346.357	N/A
26	9/19/2020	96.56	9005	4665	3747.24	526220	9406.952	N/A
27	9/19/2020	93.56	8990	6721	3743.33	526037	9242.857	N/A
28	9/19/2020	98.67	8976	3706	3648.42	526270	9509.31	N/A
29	9/20/2020	97.19	8917	6158	3694.74	525290	9256.071	N/A
30	9/20/2020	94.32	8916	3484	4056.91	505820	9305.976	N/A
31	9/21/2020	93.27	8758	5836	3780.73	526620	9250.976	N/A
32	9/21/2020	95.2	8954	5839	3806.49	526410	9148.048	N/A
33	9/21/2020	98.91	9014	5298	4353.05	504640	8972.405	N/A
34	9/22/2020	96.73	8893	4315	4361.92	505980	8776.429	N/A
35	9/22/2020	96.62	9039	5632	3714.18	505820	8936.214	N/A
36	9/22/2020	95.5	9003	5555	3555.42	505920	8892.643	N/A
37	9/23/2020	94.64	8924	5361	3620.31	525430	9222.381	N/A
38	9/23/2020	97.39	9045	5463	3876	505100	8926.619	N/A
39	9/23/2020	98.69	8911	5127	3833.3	507820	9050.6429	N/A
40	9/24/2020	98.11	8909	6436	3875	504860	8854.6905	N/A
41	9/24/2020	97.81	9043	5845	3883	504620	8784.1905	N/A
42	9/24/2020	97.48	9058	4876	4411.01	505240	8901.0952	N/A
43	9/25/2020	97.83	9076	5072	4732.69	523040	9049.4048	N/A
44	9/25/2020	98.58	9020	5469	4000	503360	8723.2857	N/A
45	9/25/2020	98.85	8970	5644	3779.65	504560	8611.5238	N/A
46	9/26/2020	99.28	8735	5112	3640.69	504900	8789.2857	N/A
47	9/26/2020	98.42	8968	5949	3829	505600	8707.0238	N/A
48	9/26/2020	99.12	8891	4573	3711	504780	8618.619	N/A
49	9/26/2020	99.3	8885	5785	3786.18	506260	8641.1429	N/A
50	9/27/2020	97.08	8510	5928	3573.8	523250	9835.9762	N/A
51	9/27/2020	98.48	8502	5208	3724	505440	8717.0714	N/A
52	9/27/2020	98.96	8514	6303	3805.24	505800	8693.7619	N/A
53	9/28/2020	99.23	8305	6238	3816.66	504980	8591.9286	N/A
54	9/28/2020	93.59	8733	5437	3951	505300	9153.119	N/A
55	9/28/2020	98.49	8691	5853	4028.01	505360	8562.1429	N/A
56	9/28/2020	100	8819	4093	4002.95	523430	8686.8333	N/A
57	9/29/2020	98.56	8196	5768	4089	505840	8644.9524	N/A
58	9/29/2020	98.58	8052	4655	3745	505100	8542.7857	N/A
59	9/29/2020	98.56	8013	4970	3742.82	505080	8465	N/A
60	9/30/2020	98.34	8145	4082	3903.52	502840	8407.5238	N/A
61	9/30/2020	99.83	8119	4721	3888	500860	8442.9762	N/A
62	9/30/2020	100.1	8383	5800	3926.83	506780	8437.3095	N/A
63	9/30/2020	100.2	8014	5960	3867.95	505420	8385.7143	N/A
	AVG=	96.2	9,072	5,509	3,695	32,158,520	579,013	TOTAL

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API 47-095-02598 Farm Name James Sine ET AL Well Number Garmin Unit 1H

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Silty Sandstone	70	190	70	190
Silty Shale	190	240	190	240
shaly sand	240	410	240	410
Shale	410	470	410	470
Dolomitic Shale	470	750	470	750
Shaly Siltstone	750	870	750	870
Silty Sandstone	870	910	870	910
Shaly Sand	910	980	910	980
Sandstone	980	1,120	980	1,120
Silty, Shaly, Sandstone	1,120	1,180	1,120	1,180
Sandstone, Tr Shale, Tr Coal	1,180	1,230	1,180	1,230
Silty Sandstone	1,230	1,510	1,230	1,510
Shaly Siltstone	1,510	1,623	1,510	1,640
Big Lime	1,653	2,477	1,640	2,536
Fifty Foot Sandstone	2,477	2,568	2,506	2,632
Gordon	2,568	2,940	2,602	3,024
Fifth Sandstone	2,940	3,226	2,994	3,333
Bayard	3,226	3,794	3,303	3,946
Speechley	3,794	4,120	3,916	4,295
Balltown	4,120	4,309	4,265	4,497
Bradford	4,309	4,573	4,467	4,782
Benson	4,573	4,735	4,752	4,955
Alexander	4,735	5,939	4,925	6,301
Sycamore	5,810	5,909	6,130	6,271
Middlesex	5,909	5,997	6,271	6,438
Burkett	5,997	6,019	6,438	6,498
Tully	6,019	6,028	6,498	6,522
Marcellus	6,028	NA	6,522	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique depth.

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/7/2020
Job End Date:	9/30/2020
State:	West Virginia
County:	Tyler
API Number:	47-095-02598-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Garmin 1H
Latitude:	39.41512000
Longitude:	-80.95724000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,095
Total Base Water Volume (gal):	24,281,709
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Produced Water Blend	Halliburton	Base Fluid	Water	7732-18-5	100.00000	86.38983	Density = 8.50
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.13199	

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OPTIFLO-II DELAYED RELEASE BREAKER	Halliburton	Breaker					
				Listed Below			
Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant					
				Listed Below			
Sand-Premium White-40/70	Halliburton	Proppant					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
Excelerate LX-15	Halliburton	Friction Reducer					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			
HAI-501	Halliburton	Acid Corrosion Inhibitor					
				Listed Below			
HYDROCHLORI C ACID, 22 BAUME	Halliburton	Solvent					
				Listed Below			

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Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

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			Crystalline silica, quartz	14808-60-7	100.00000	13.46049	
			Hydrochloric acid	7647-01-0	30.00000	0.03075	
			Complex Amine Compound	Proprietary	60.00000	0.02127	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01064	
			Guar gum	9000-30-0	100.00000	0.00322	
			Glutaraldehyde	111-30-8	30.00000	0.00247	
			Sobitan, mono-9-octadecenoate, (Z)	1338-43-8	5.00000	0.00177	
			Surfactant	Proprietary	5.00000	0.00177	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00041	
			Ethoxylated alcohols	Proprietary	5.00000	0.00036	
			Organic chloride compound	Proprietary	1.00000	0.00035	
			Alkoxyated polyhydric alcohol	Proprietary	1.00000	0.00035	
			Methanol	67-56-1	100.00000	0.00027	
			Ammonium persulfate	7727-54-0	100.00000	0.00011	
			Ethanol	64-17-5	1.00000	0.00008	
			Mixture of dimer and trimer fatty acids of indefinite composition derived from tall oil	61790-12-3	30.00000	0.00006	
			Modified thiourea polymer	Proprietary	30.00000	0.00006	
			Oxylated phenolic resin	Proprietary	30.00000	0.00003	
			Hexadecene	629-73-2	5.00000	0.00001	
			Propargyl alcohol	107-19-7	5.00000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Organic salt #1	Proprietary	0.01000	0.00000	
			Formaldehyde	50-00-0	0.01000	0.00000	
			Organic salt #2	Proprietary	0.01000	0.00000	

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			Acrylamide	79-06-1	0.01000	0.00000	
			Sodium glycolate	2836-32-0	0.01000	0.00000	
			Nitrated acetate salt	Proprietary	0.01000	0.00000	
			Sodium hydroxide	1310-73-2	0.01000	0.00000	
			C.I. pigment Orange 5	3468-63-1	1.00000	0.00000	

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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**RADIAL CEMENT BOND LOG
GAMMA RAY / CCL / VDL
TEMP / CEMENT MAP**

Company ANTERO RESOURCES CORPORATION Well GARMIN UNIT 1H Field MARCELLUS County TYLER State WV	Country US	Company	ANTERO RESOURCES CORPORATION		
		Well	GARMIN UNIT 1H		
		Field	MARCELLUS		
		County	TYLER		
		State	WV		
		Location:	API #: 47095025980000		Other Services
			AFE # A10520		
		SEC	TWP	RGE	Elevation
		Permanent Datum	GL	Elevation	N/A
		Log Measured From	KB		K.B.
		Drilling Measured From	KB 30 FT		D.F.
					G.L.

Date	7 AUG 2020
Run Number	1
Depth Driller	22442
Depth Logger	6577
Bottom Logged Interval	6587
Top Log Interval	SURFACE
Open Hole Size	N/A
Type Fluid	WATER
Density / Viscosity	N/A
Max. Recorded Temp.	134
Estimated Cement Top	2760
Time Well Ready	ON ARRIVAL
Time Logger on Bottom	7:57
Equipment Number	214182
Location	BRIDGEPORT WW
Recorded By	K.LINGER
Witnessed By	BRIAN CARTER

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
Casing Record		Size	Wgt/Ft	Top	Bottom		
Surface String		13.375	N/A	SURFACE	371		
Prot. String		9.625	N/A	SURFACE	2675		
Production String		5.5	23	SURFACE	22,442		
Liner							

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

Comments

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**LOG RAN UNDER 1500 PSI
CORRELATED TO PIPE TALLY
SHIFTED DOWN HOLE 15 FT TO MATCH
MARKER JOINT @ 5490 - 5500
CEMENT TOP @ 2760**

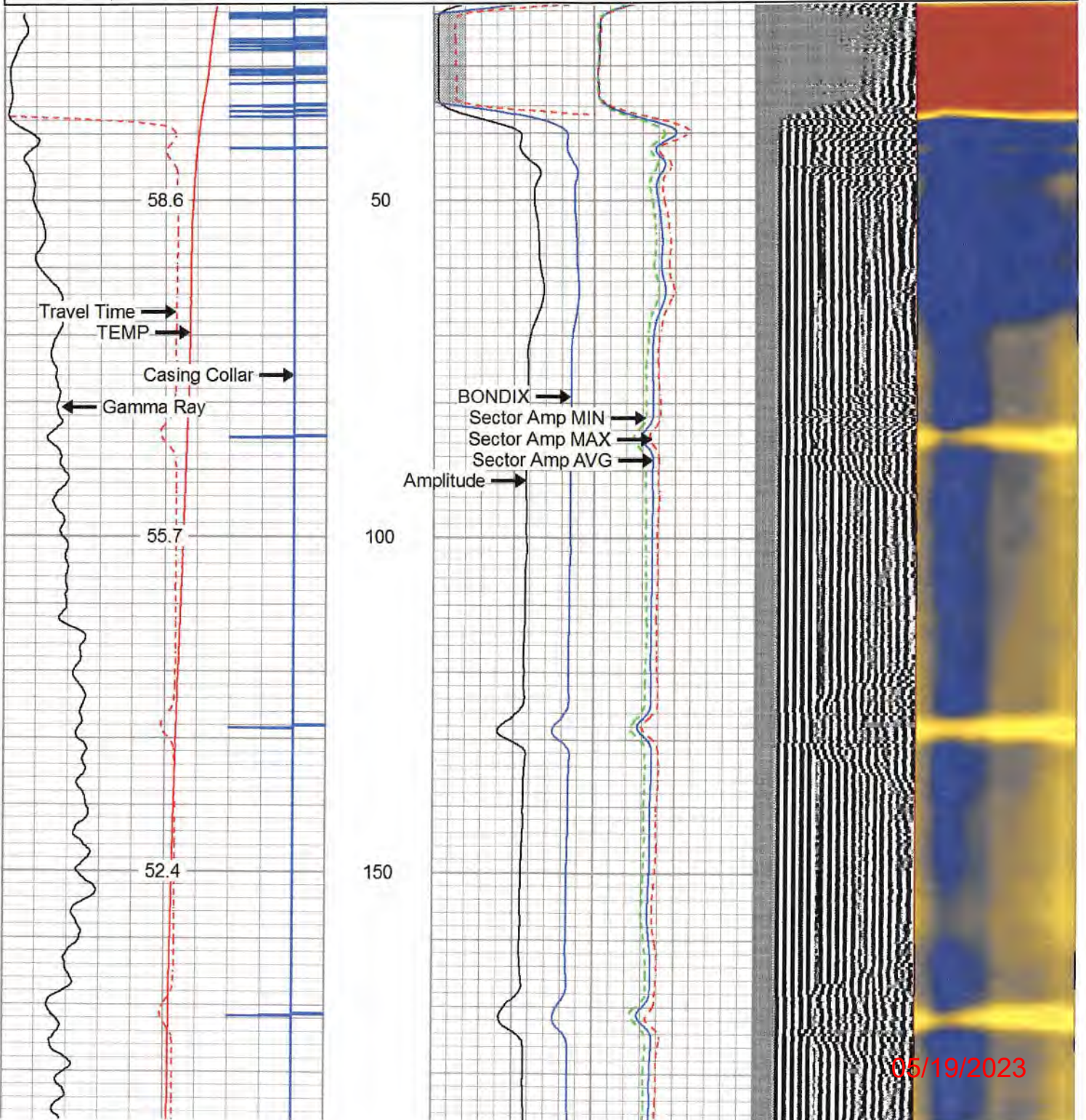


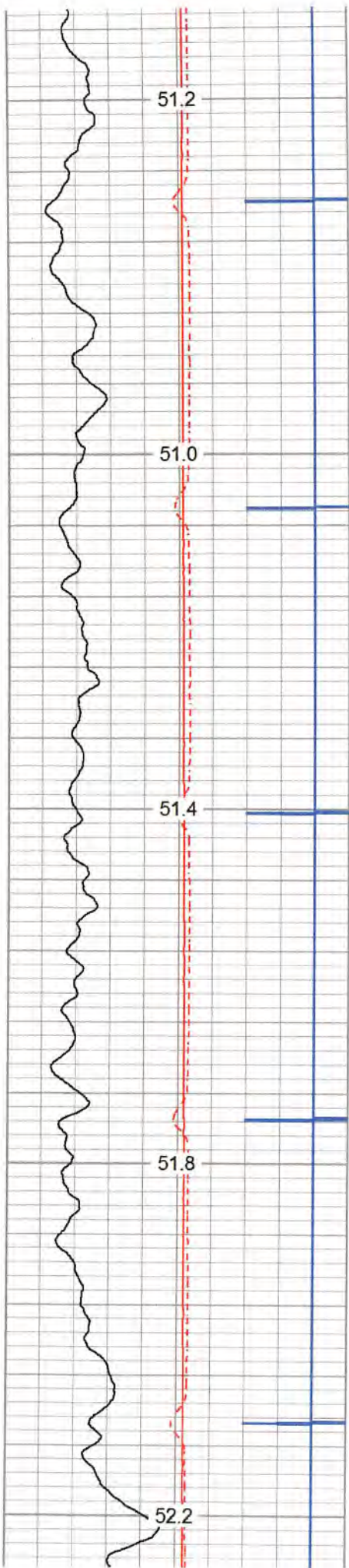
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 Presentation Format antero
 Dataset Creation Fri Aug 07 18:27:20 2020
 Charted by Depth in Feet scaled 1:240

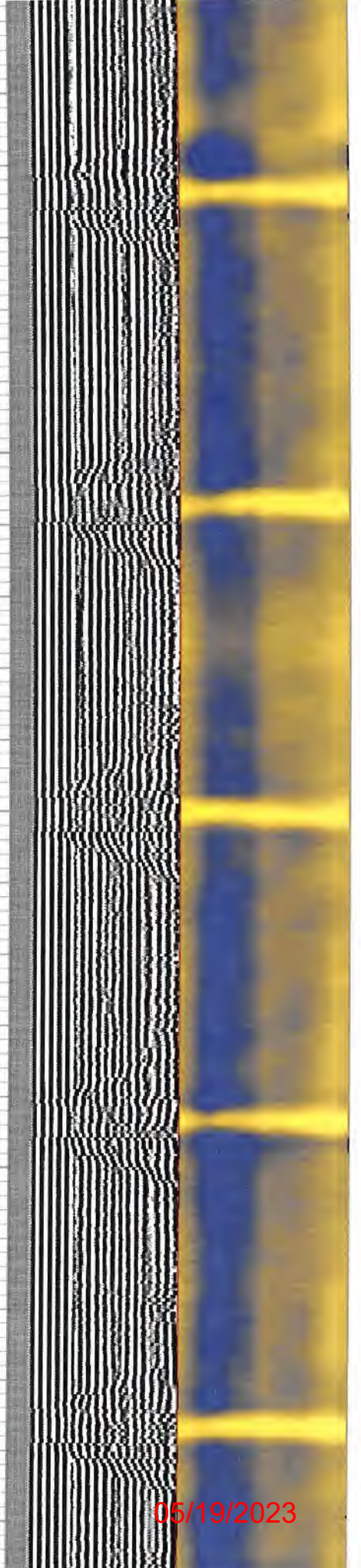
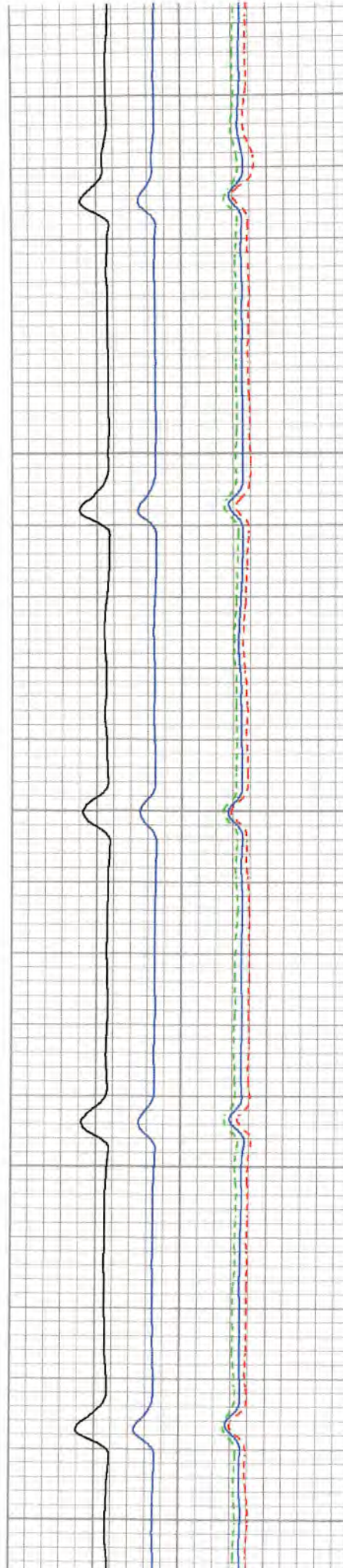
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9	Casing Collar	-1	0 (mV) 100	Sector Amp MAX	200 (usec) 1200			
0	Gamma Ray	180	Amp X5	Sector Amp MIN				
0	TEMP (degF)	100	0 (mV) 20					
180	GR	360	1 BONDIX 0					

TEMP (degF)

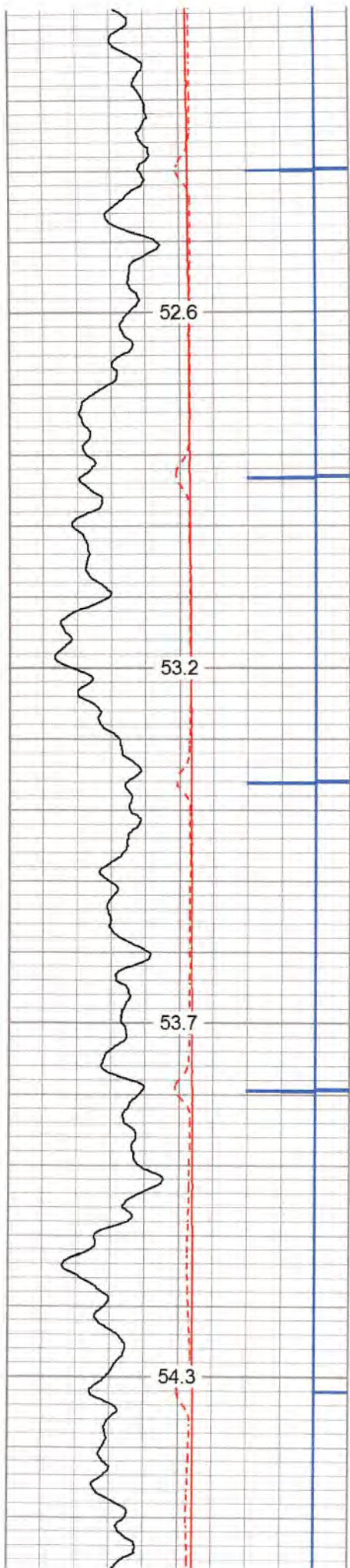




200
250
300
350
400



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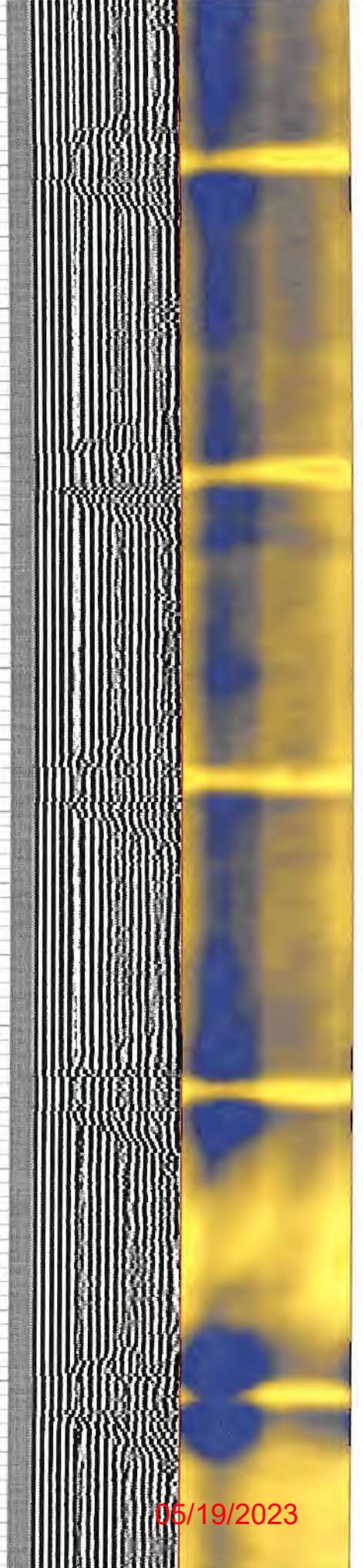
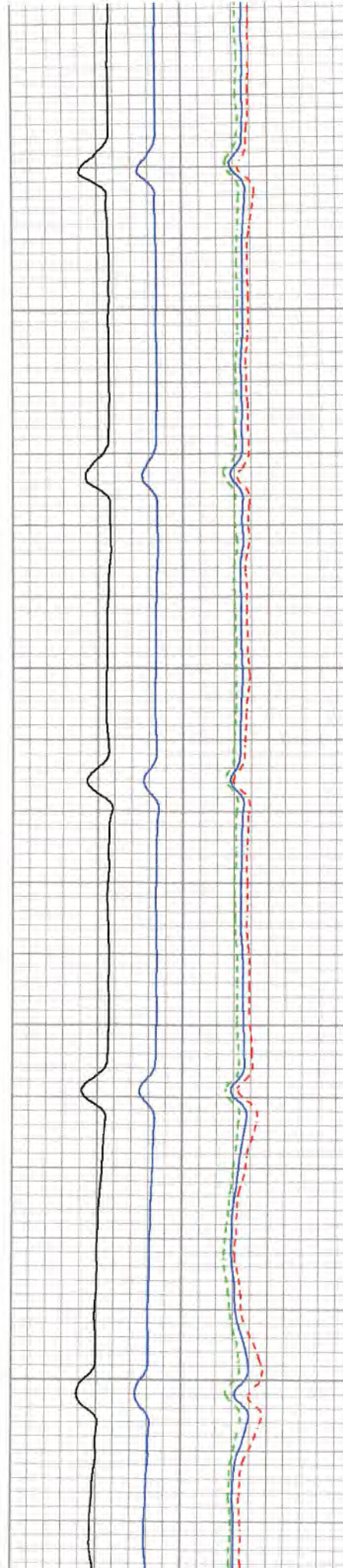


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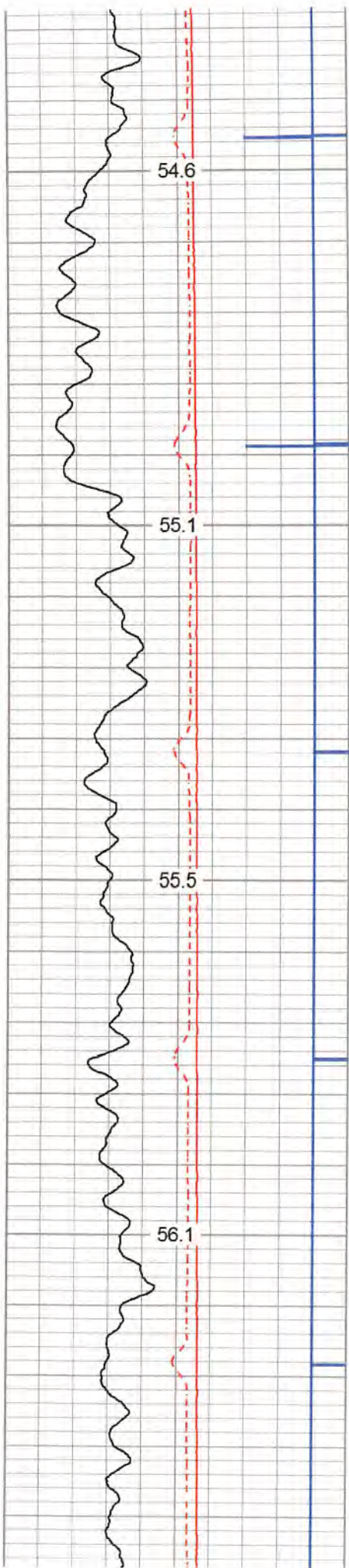
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600



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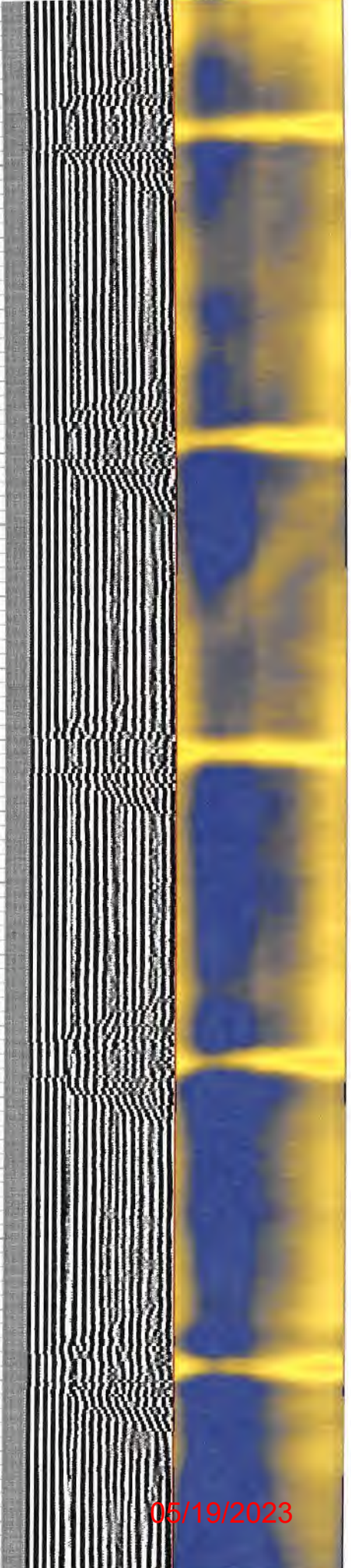
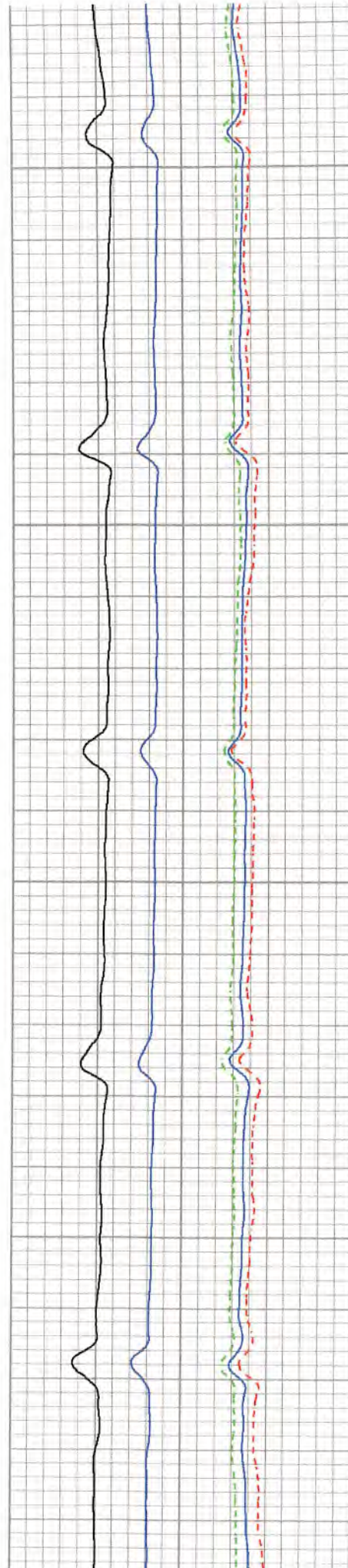


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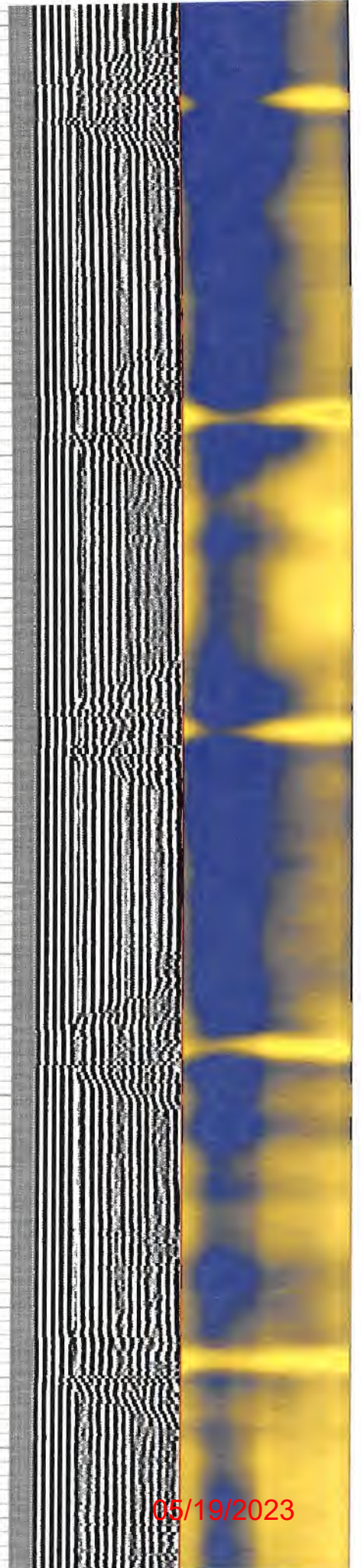
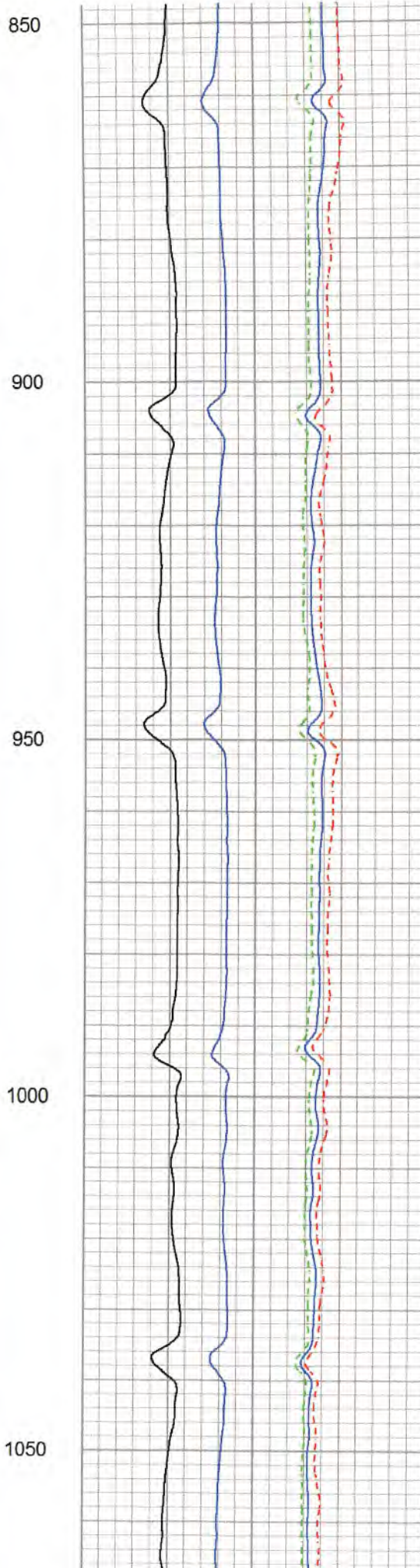
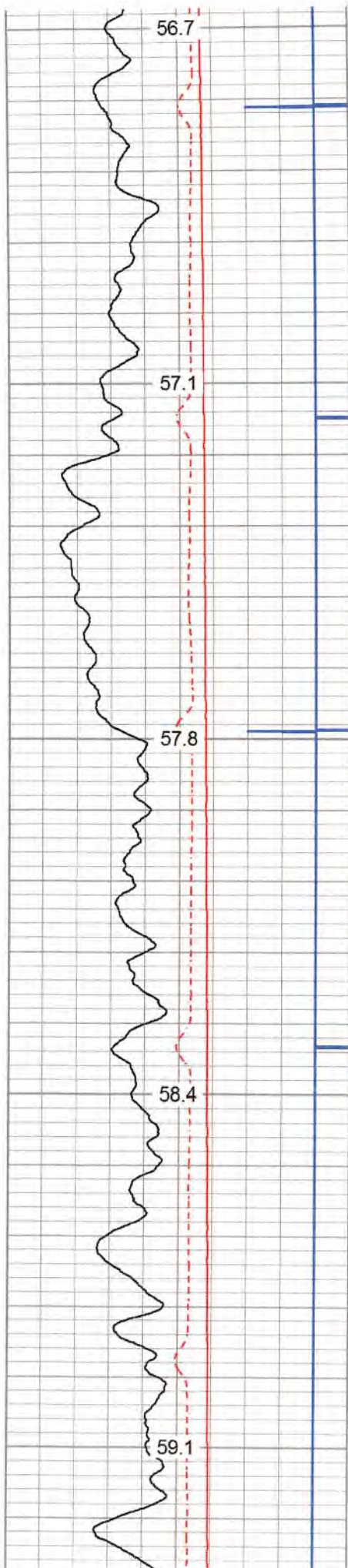
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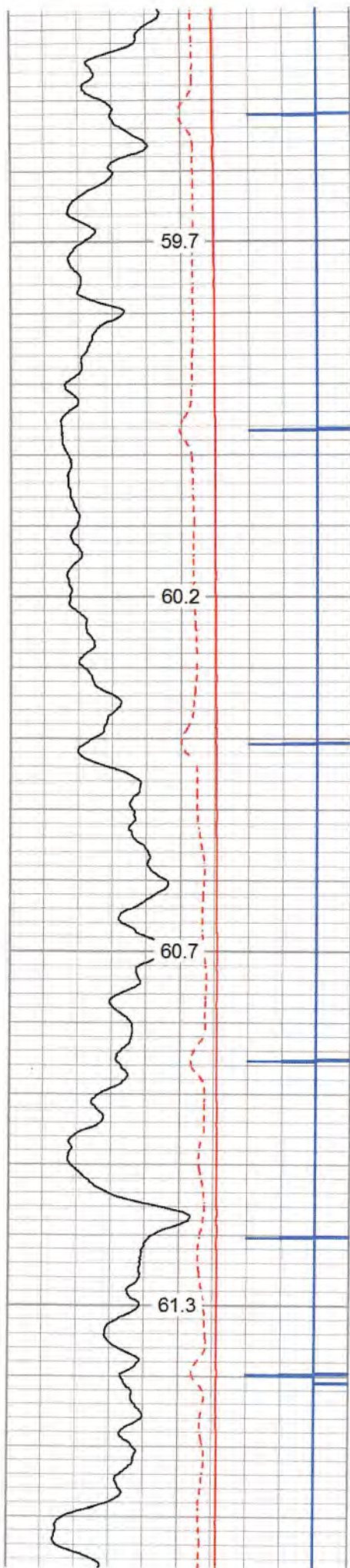
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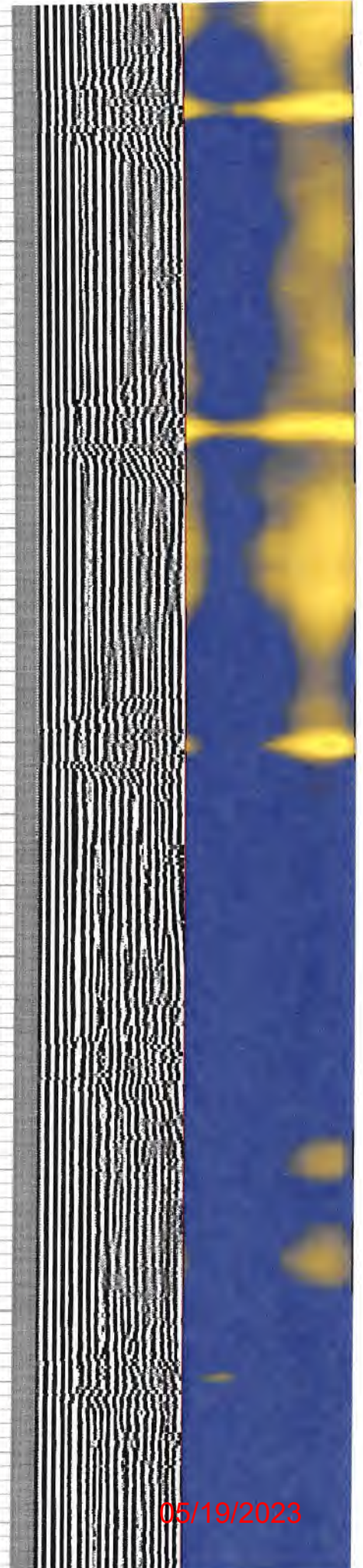
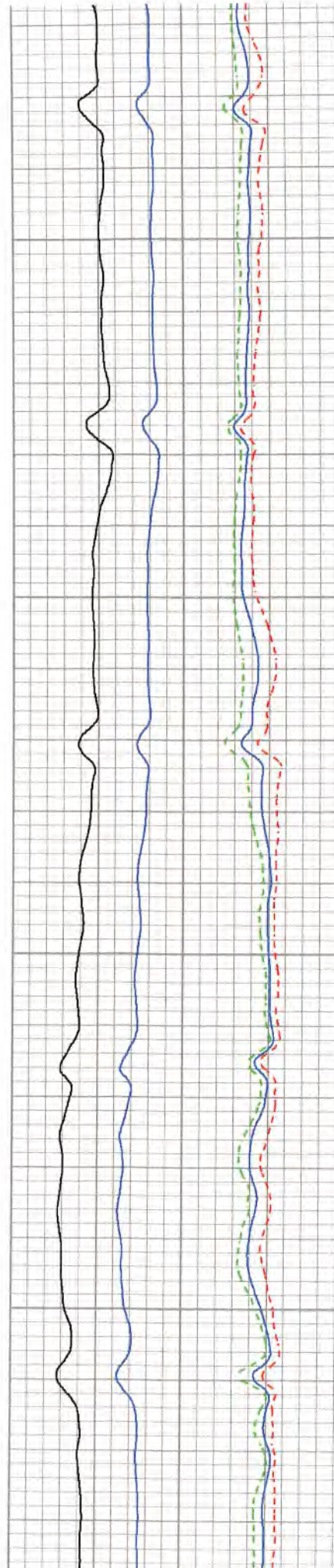


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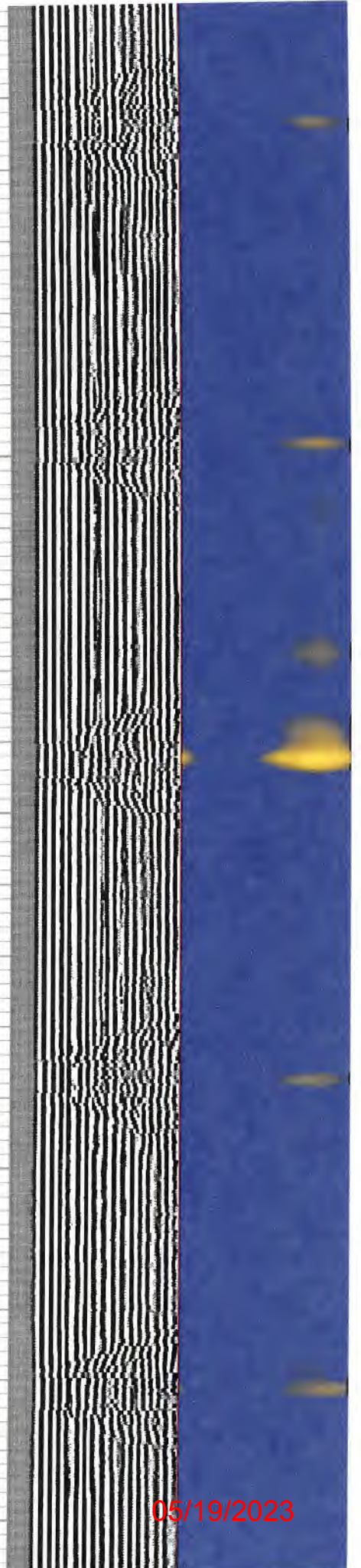
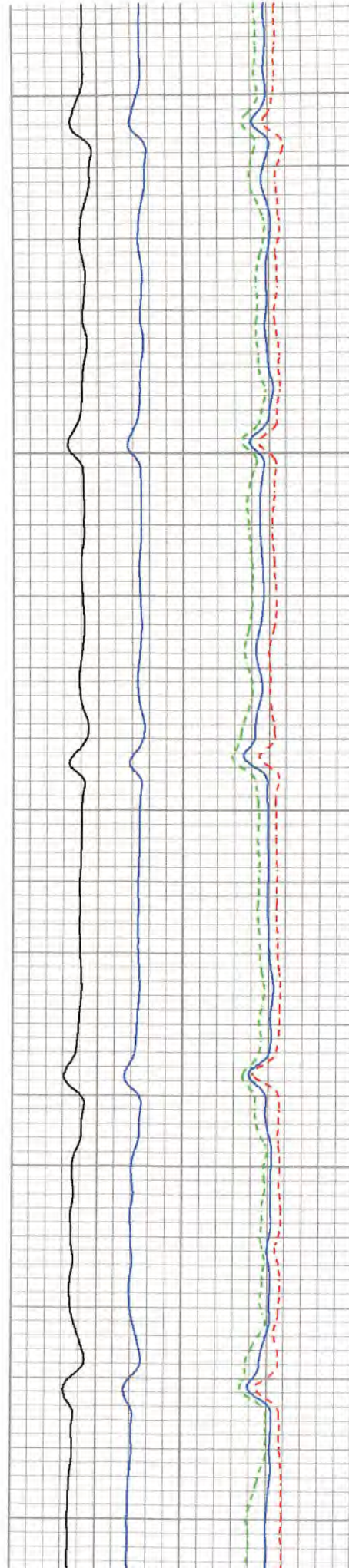
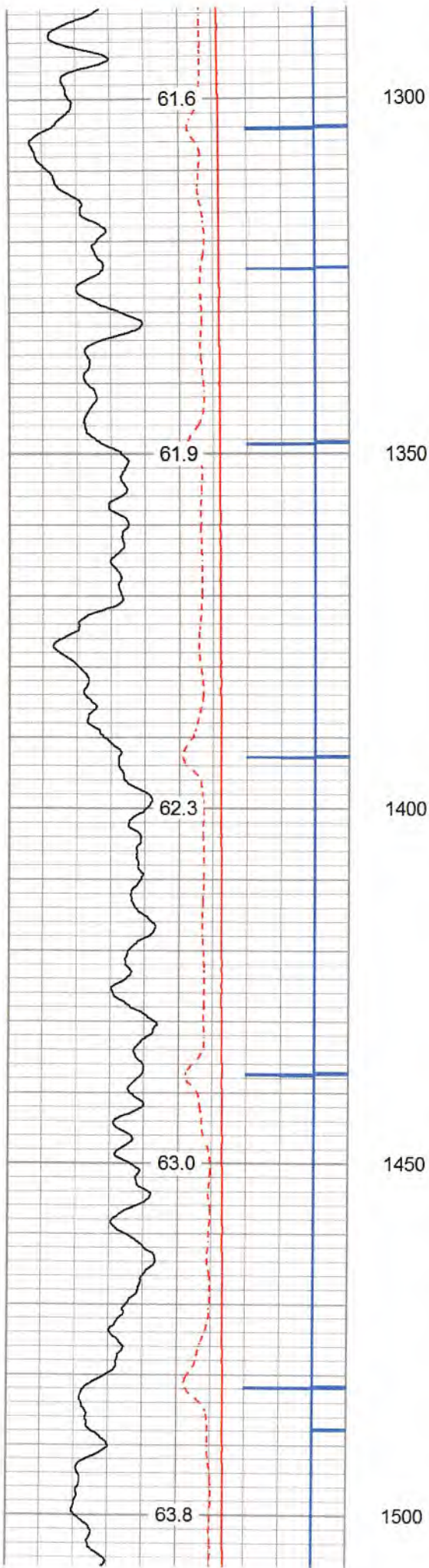
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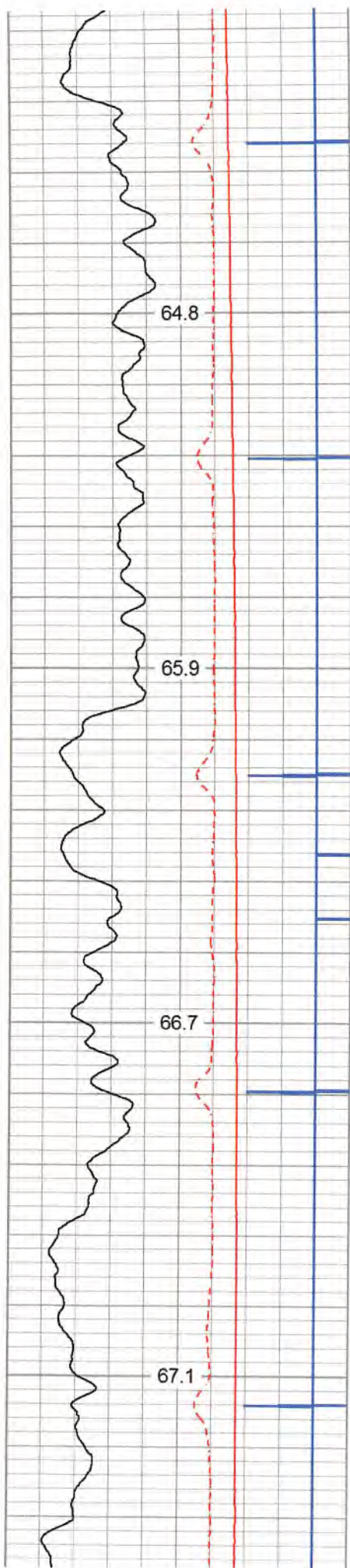
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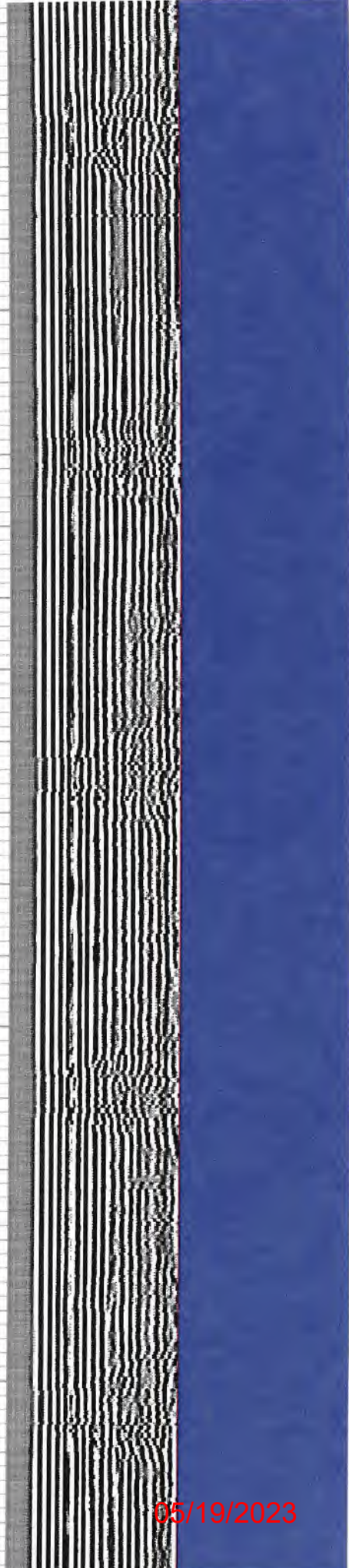
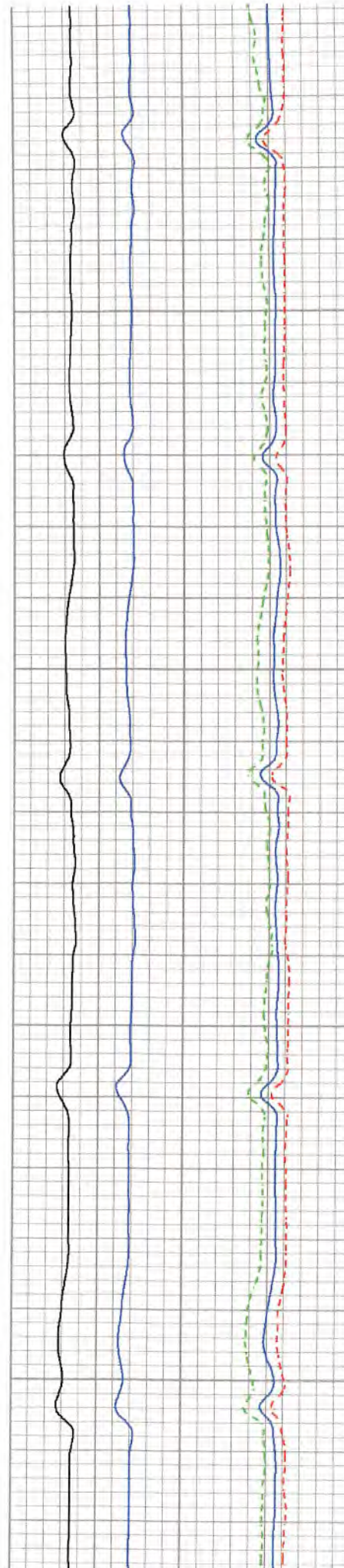


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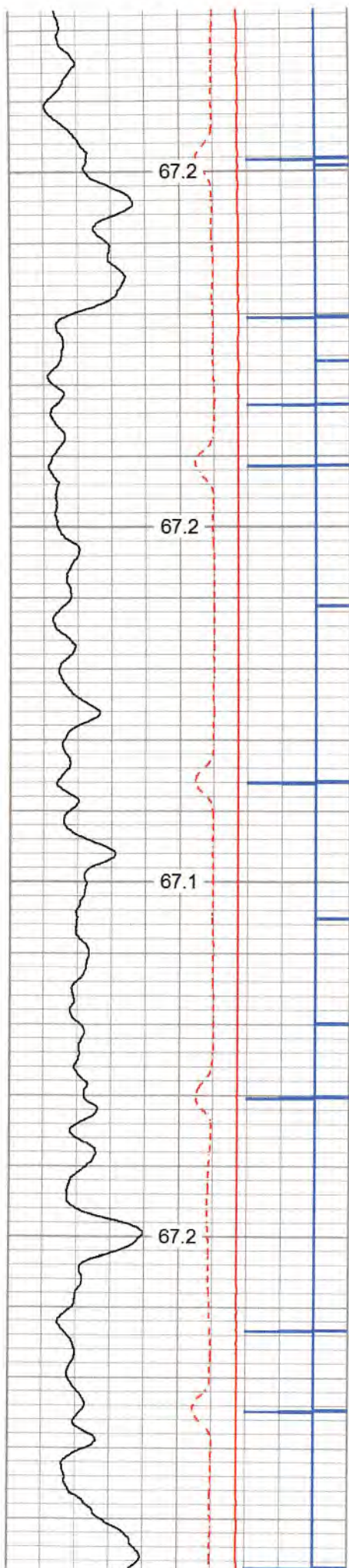
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1700



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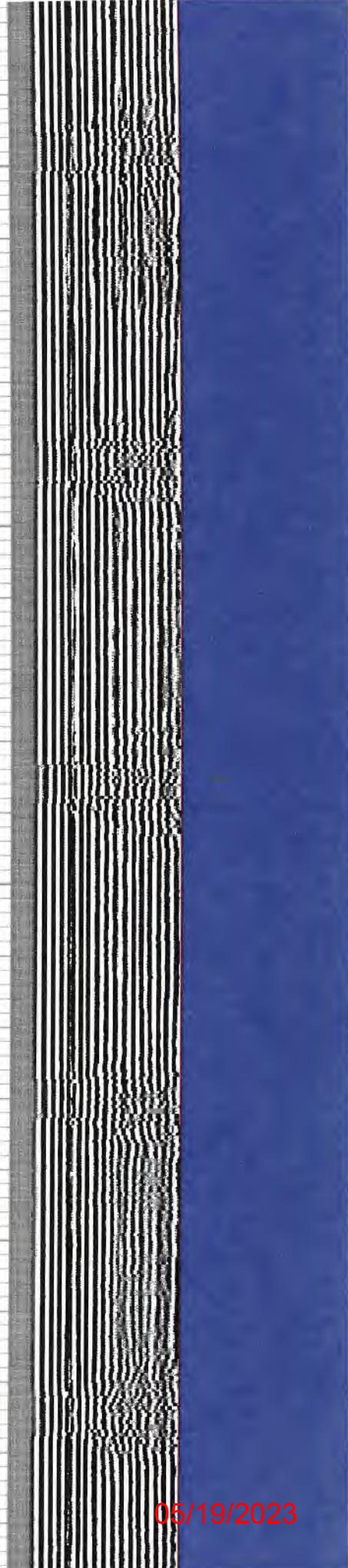
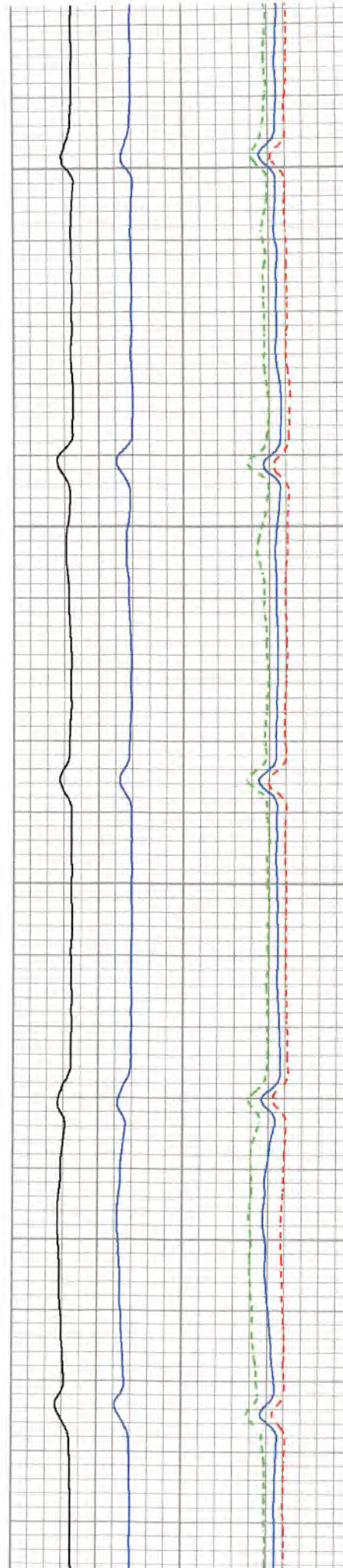


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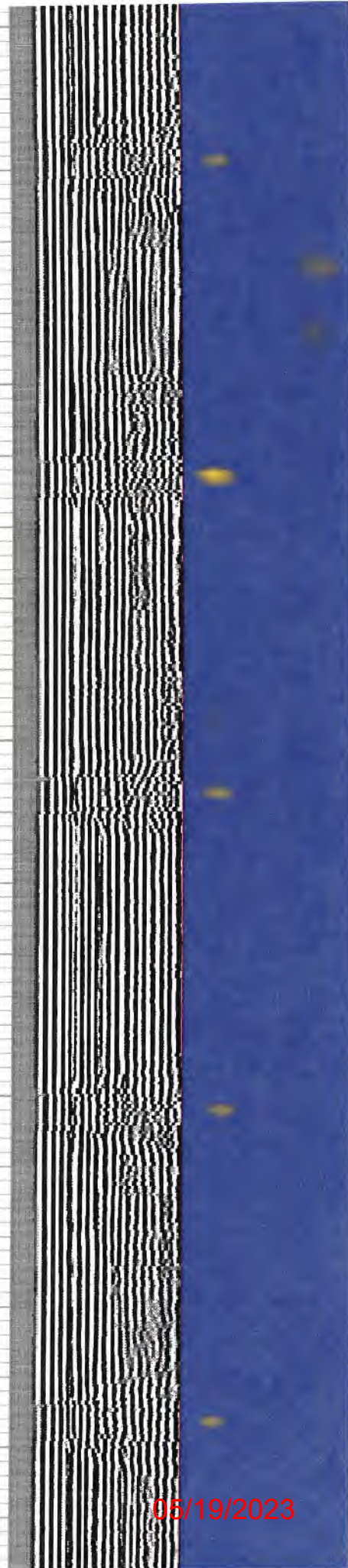
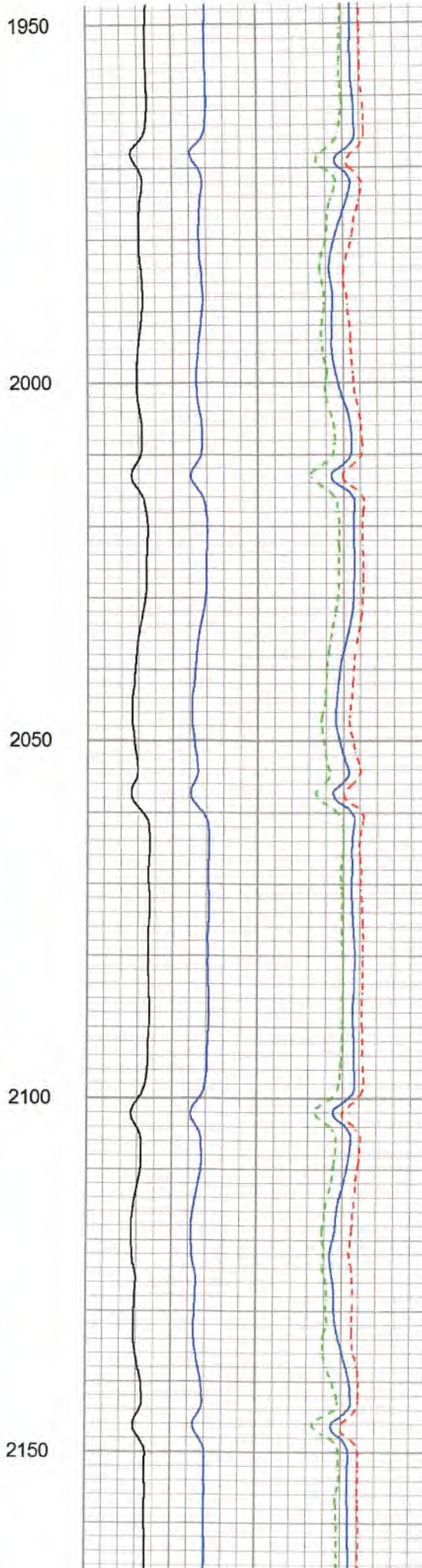
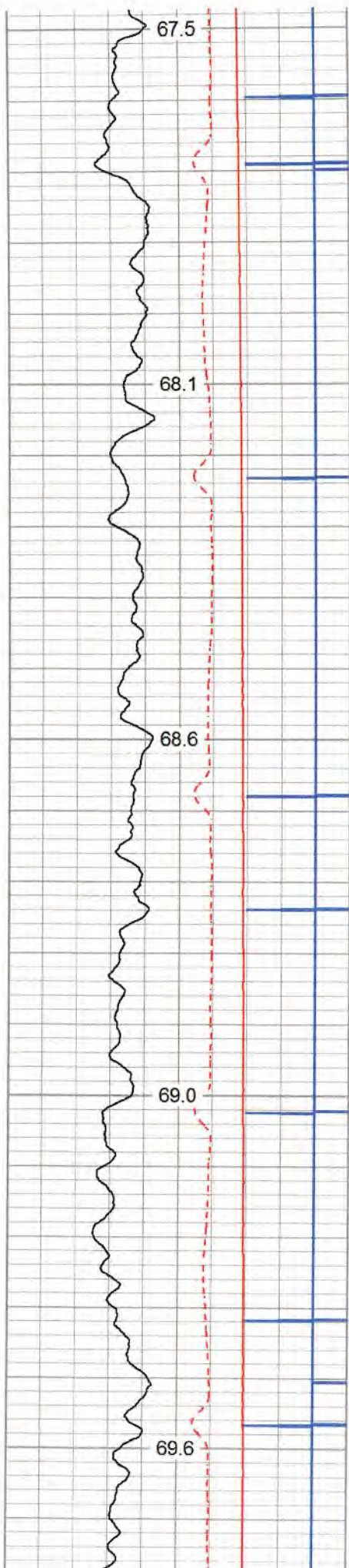
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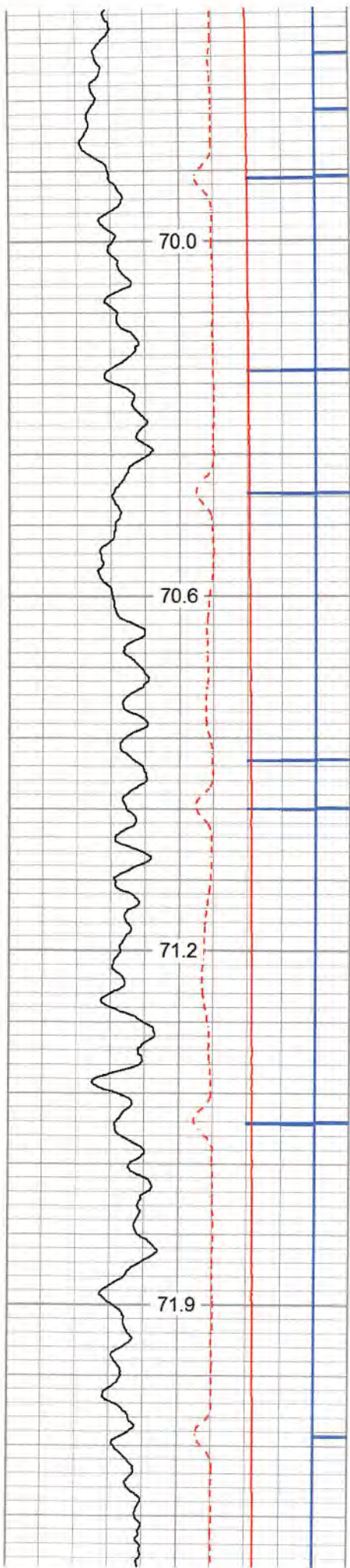
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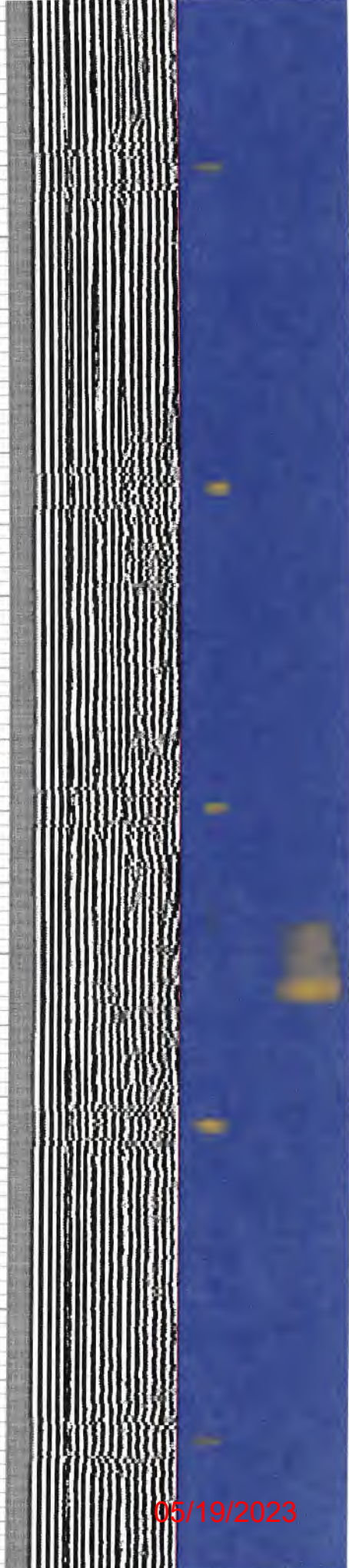
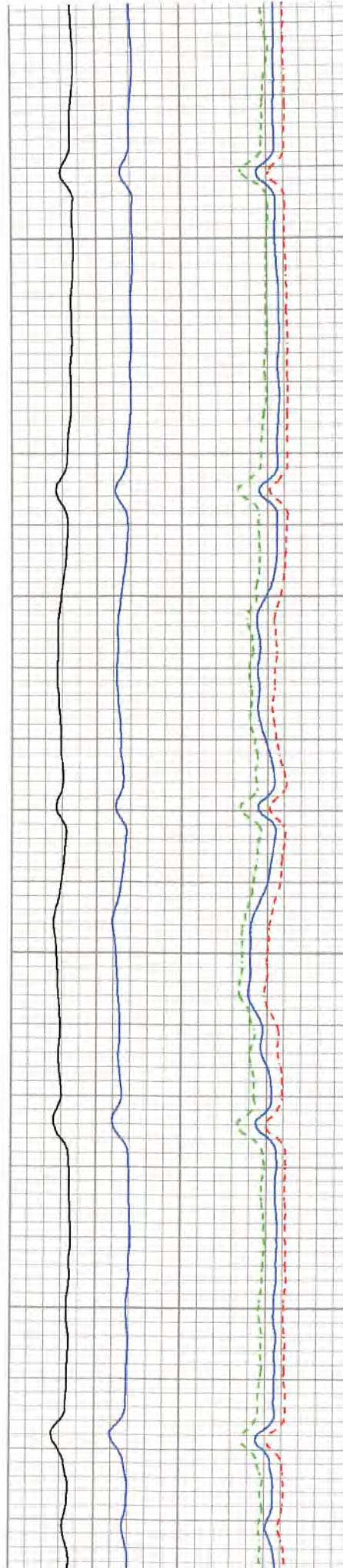
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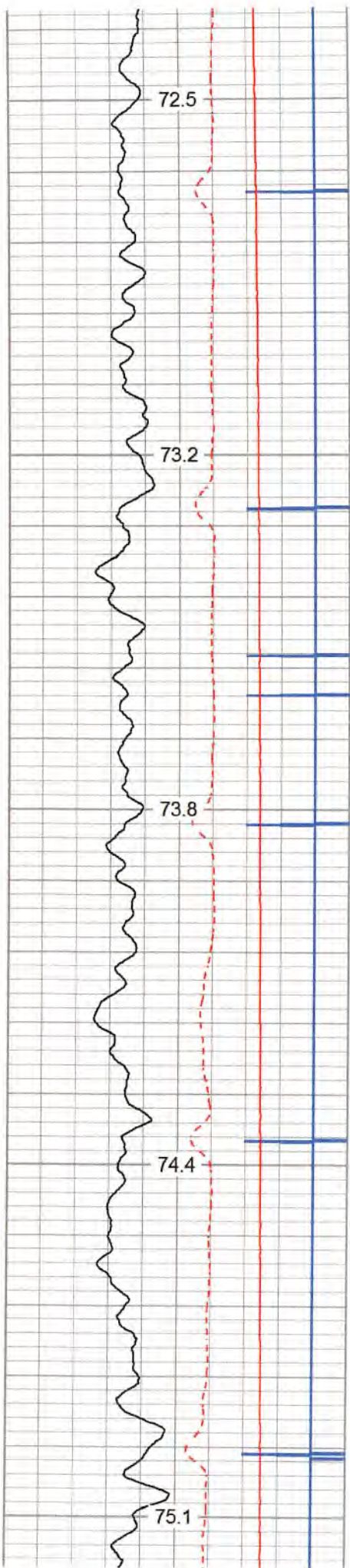
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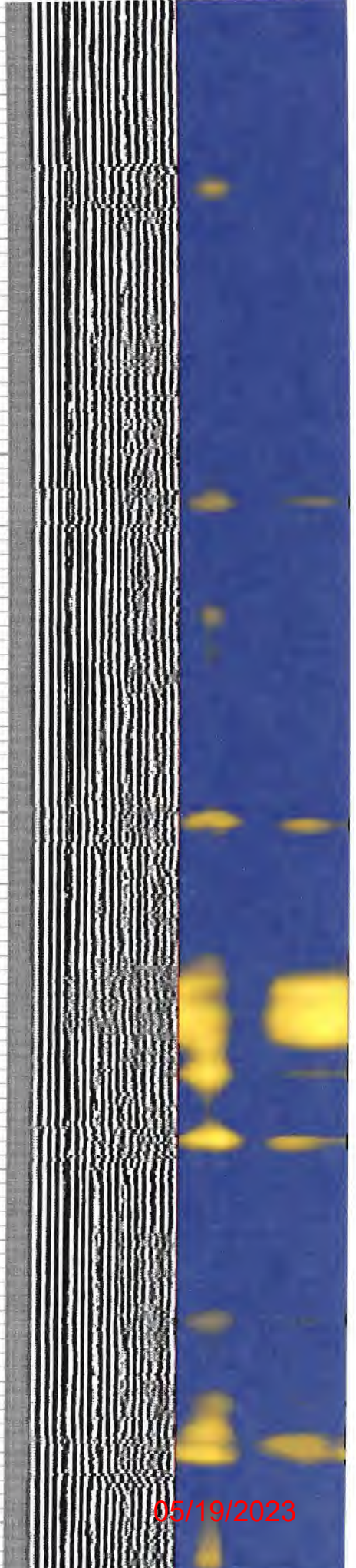
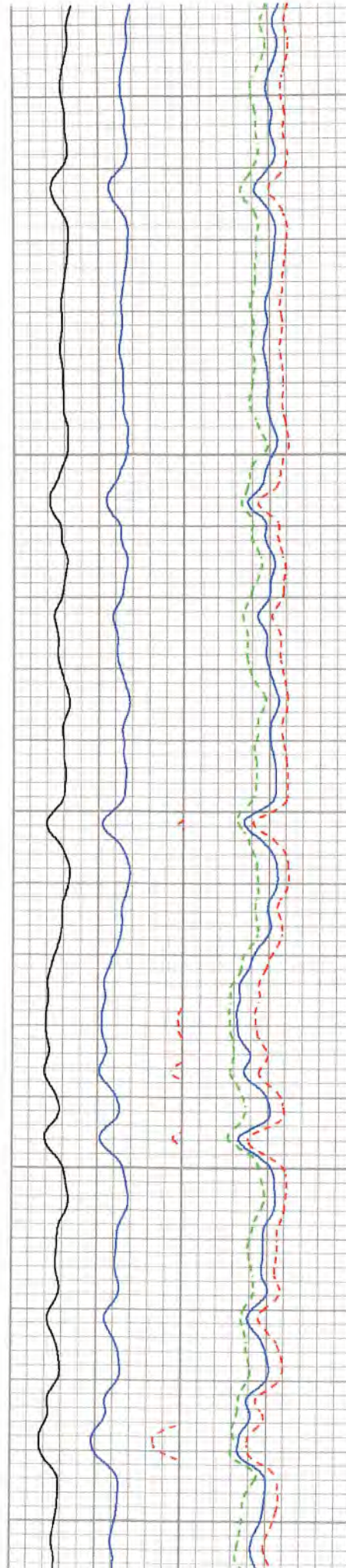
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2300
2350



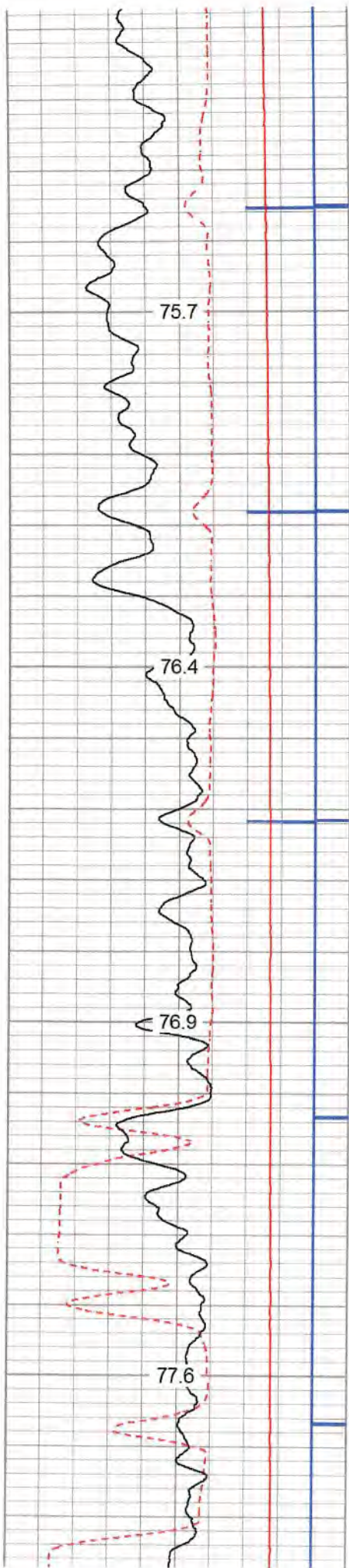
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2450
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2550
2600



05/19/2023

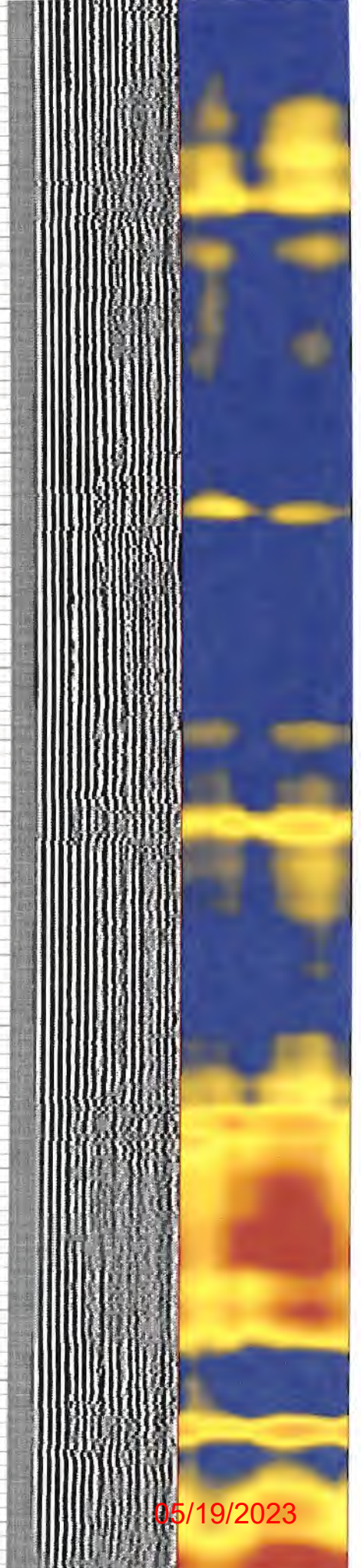
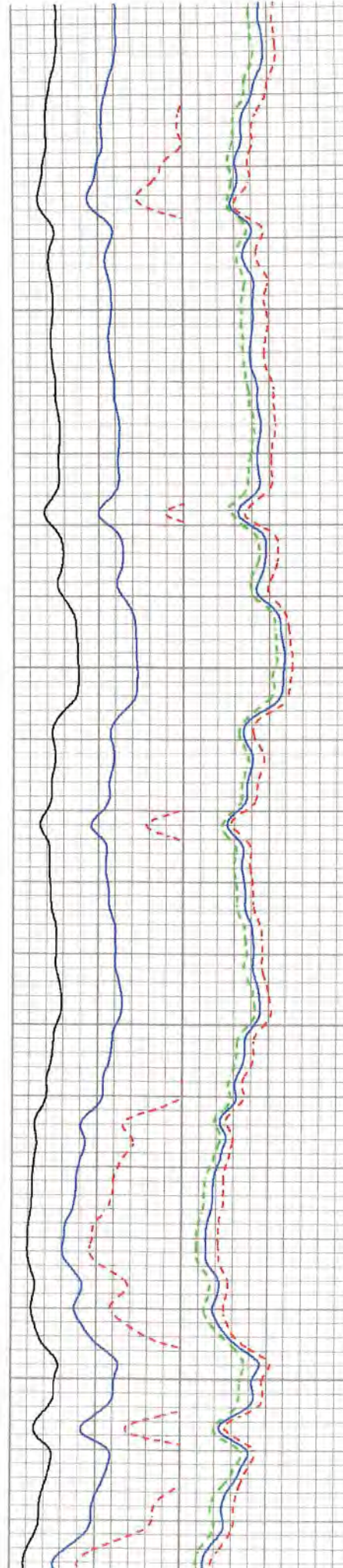


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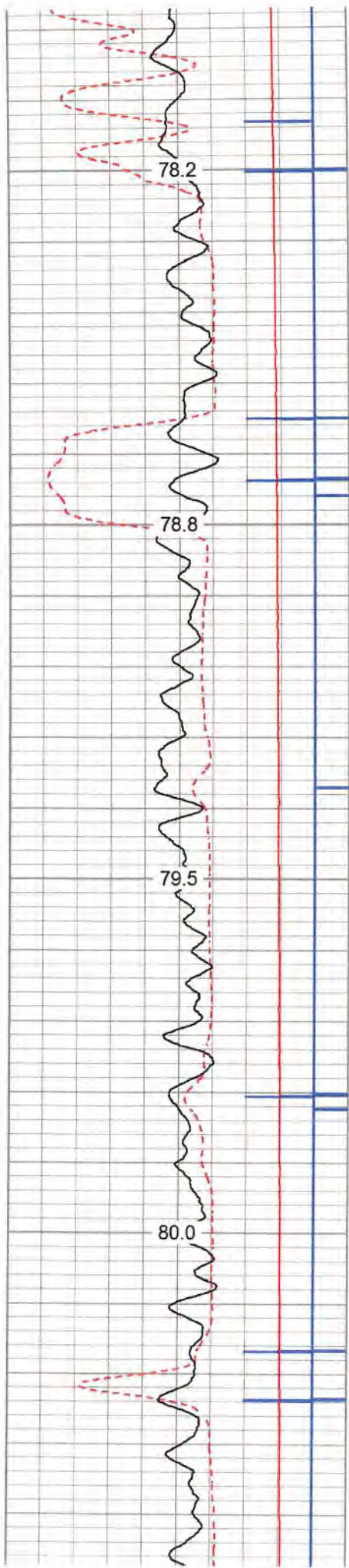
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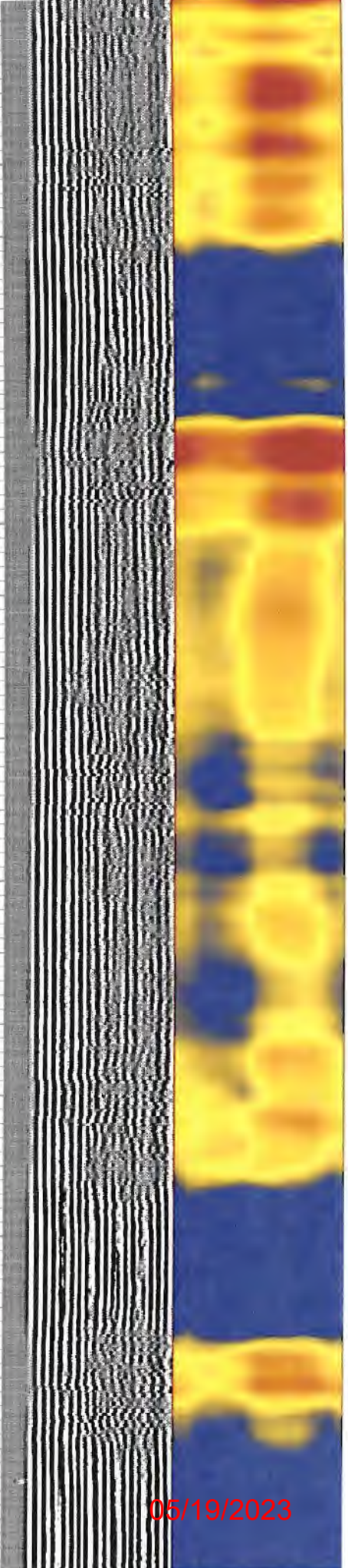
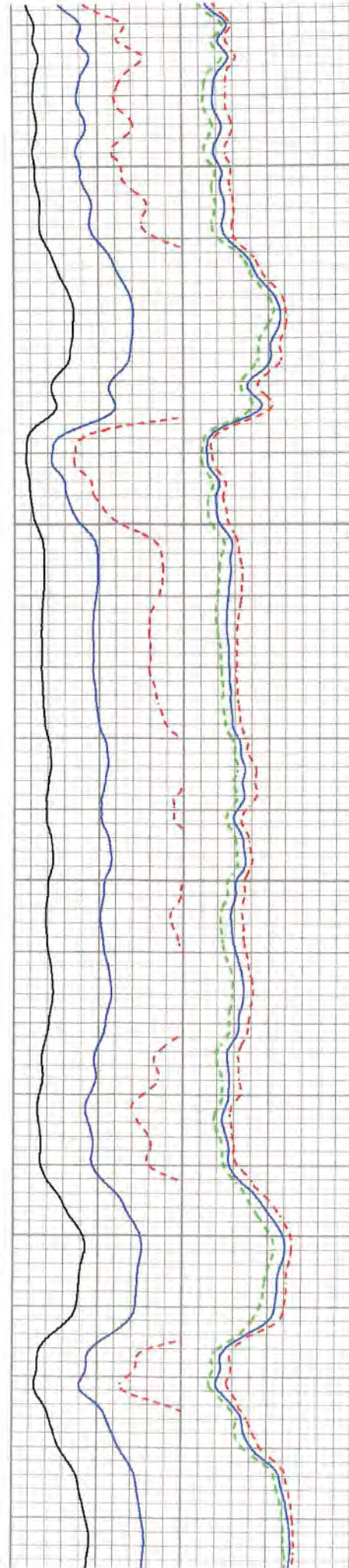


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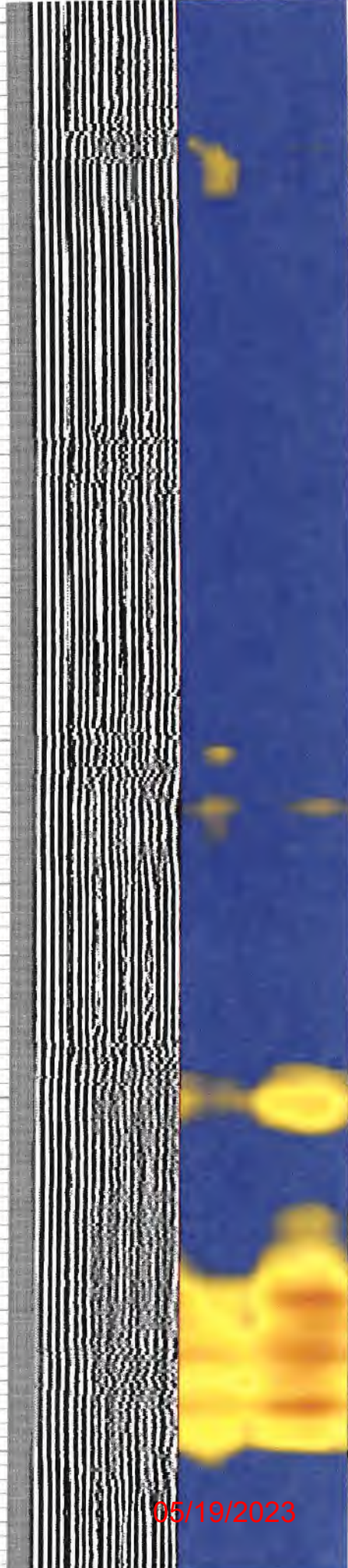
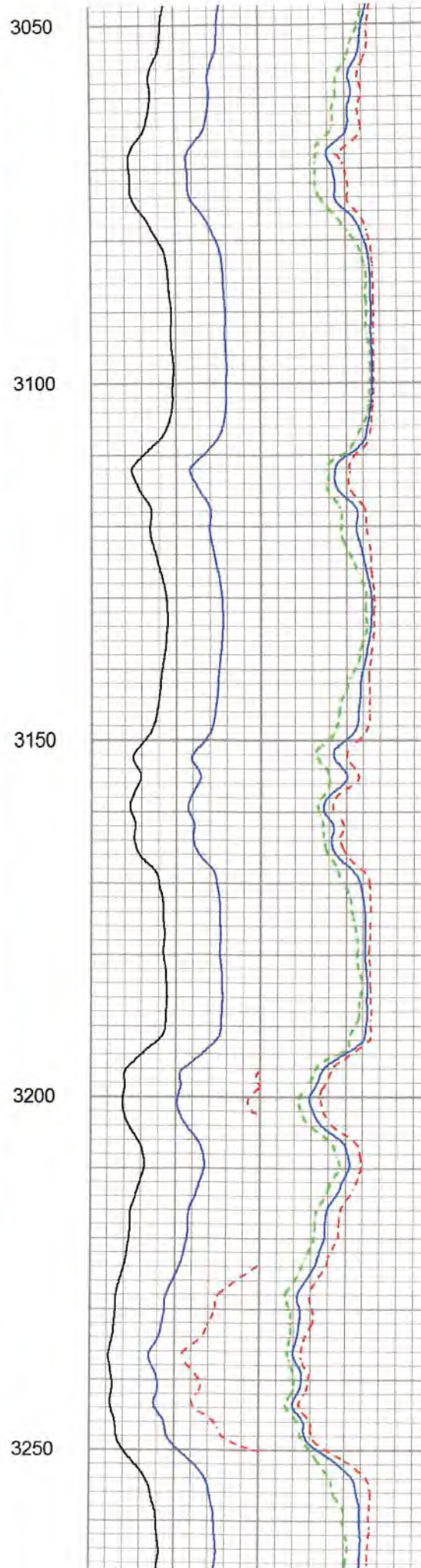
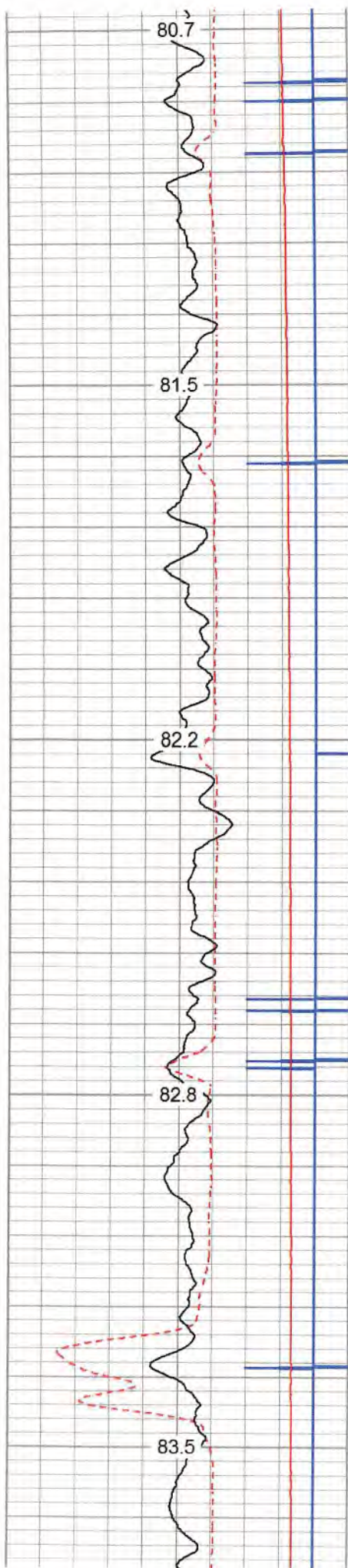
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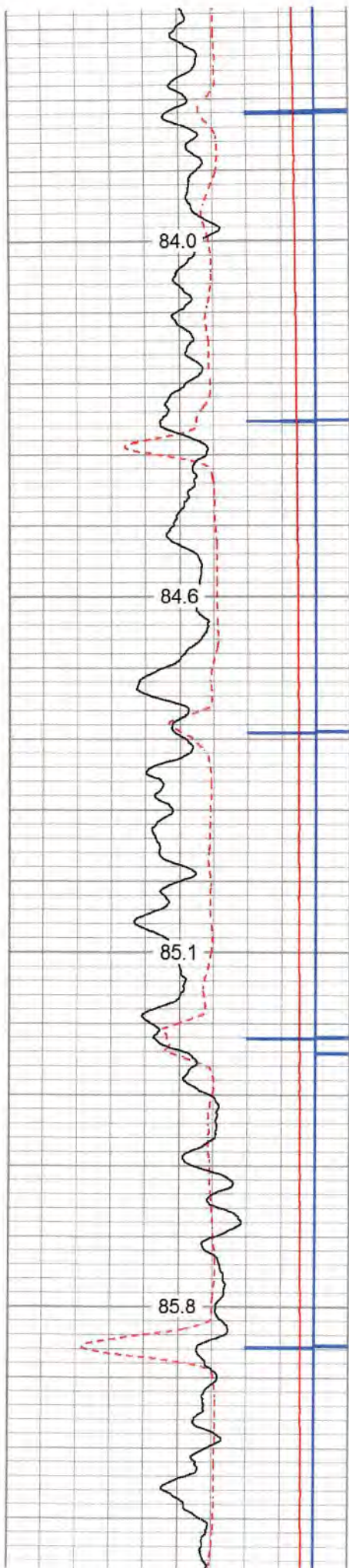
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3000



05/19/2023



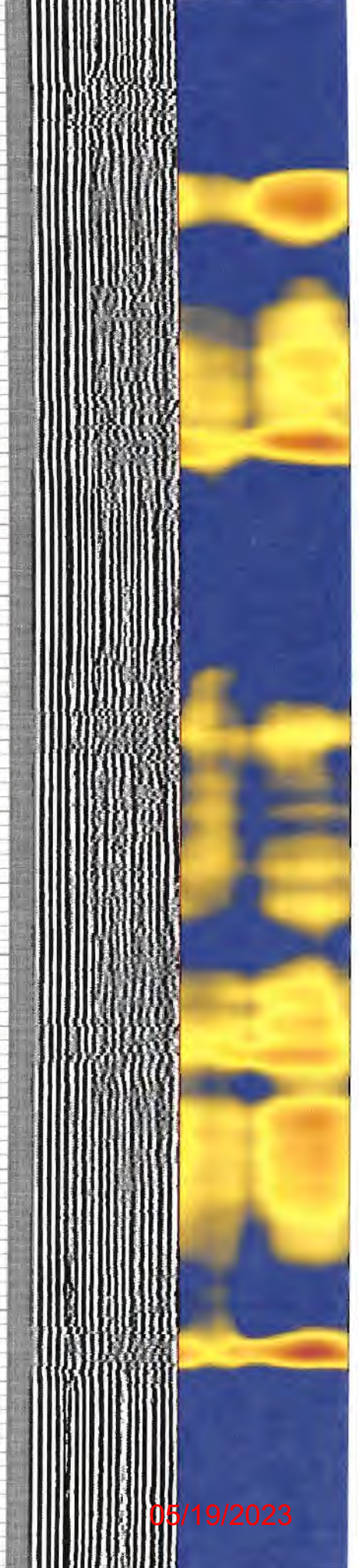
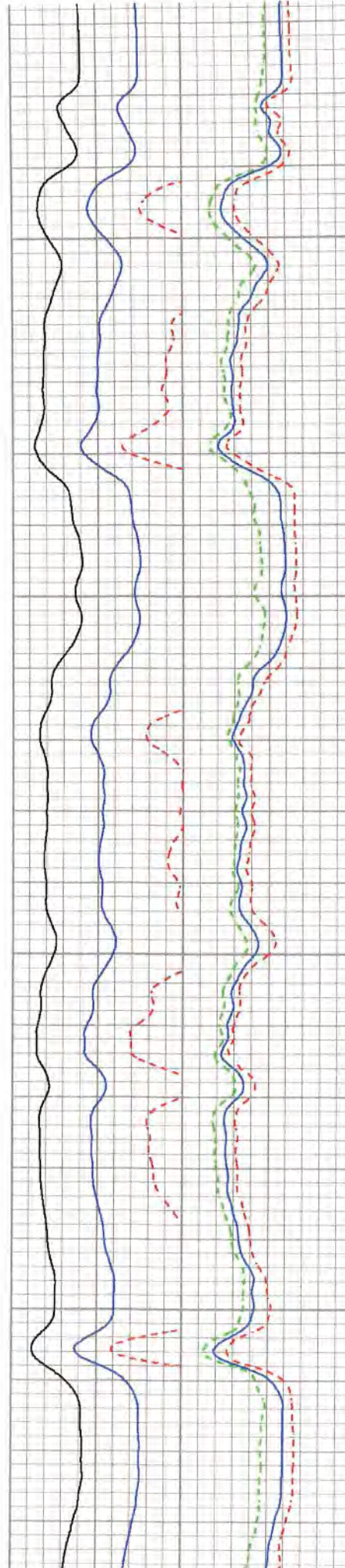


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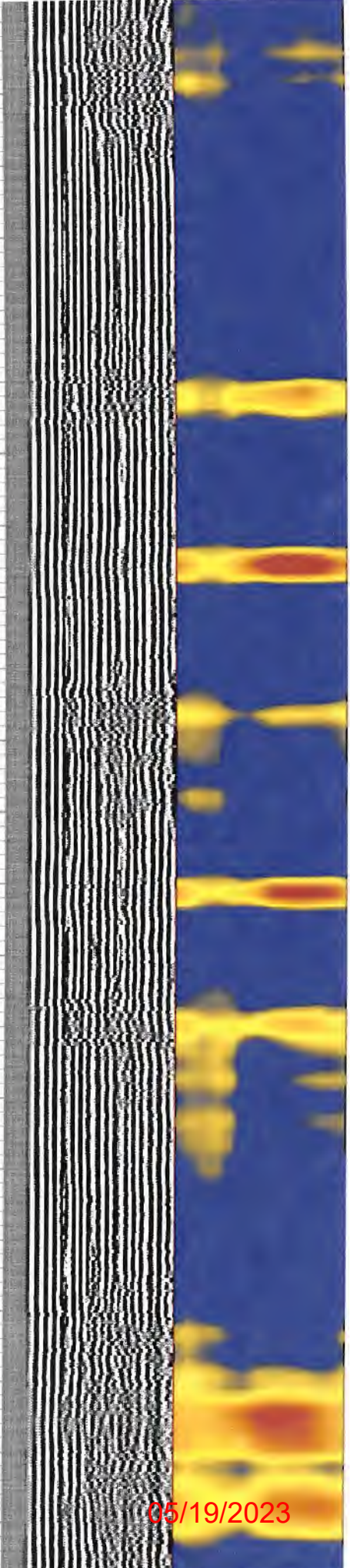
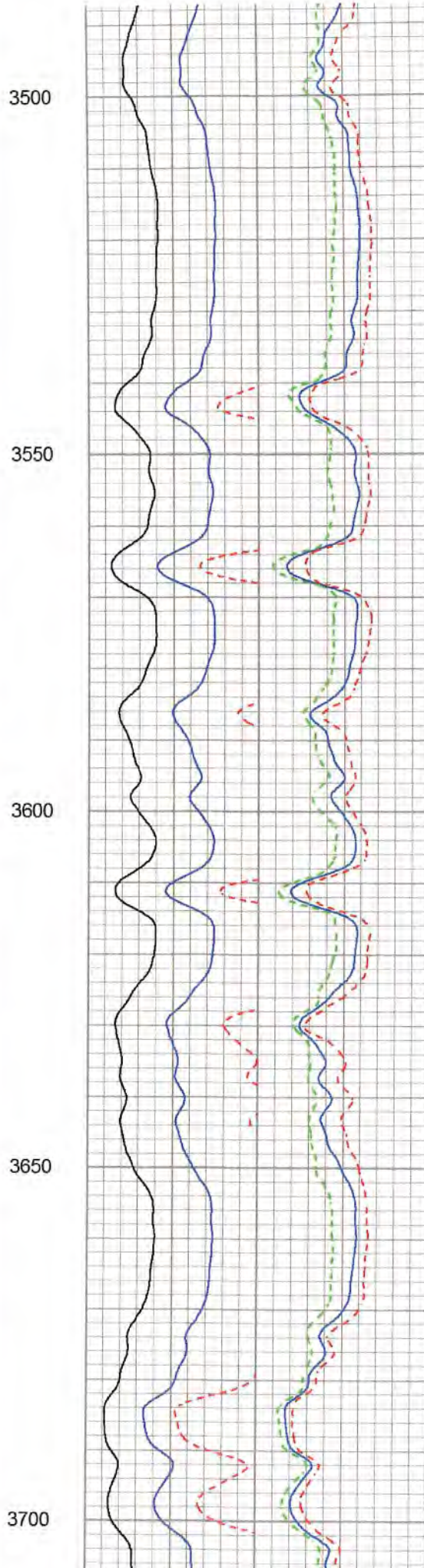
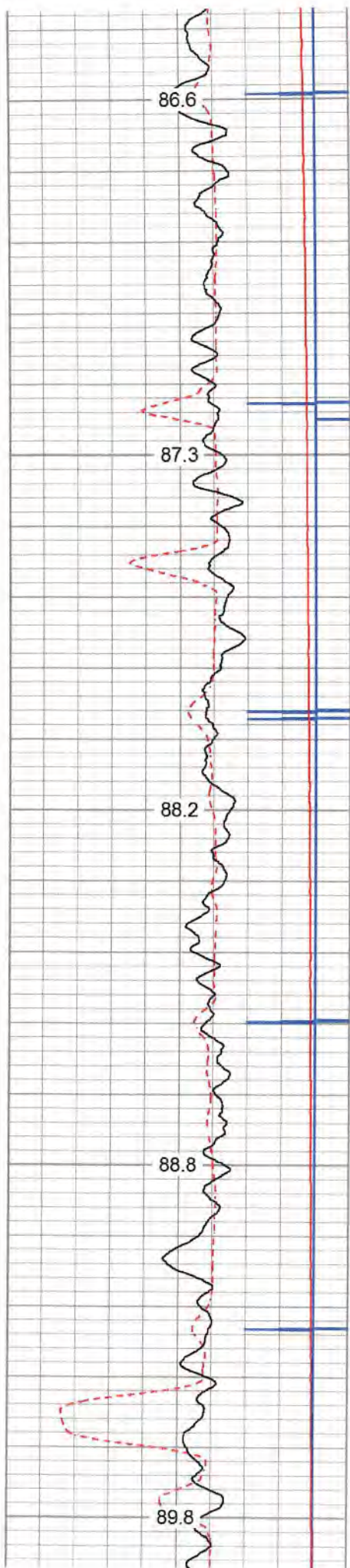
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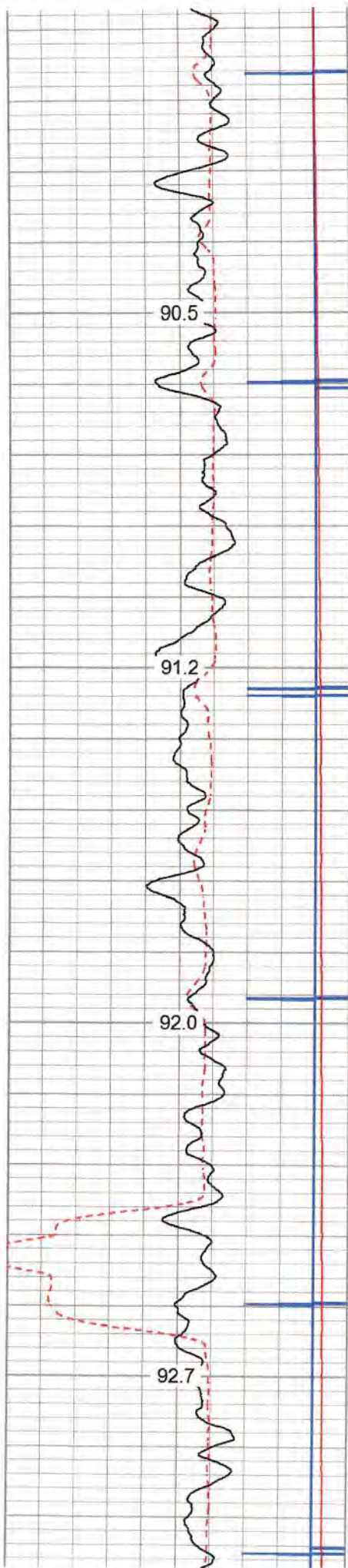
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3450



05/19/2023



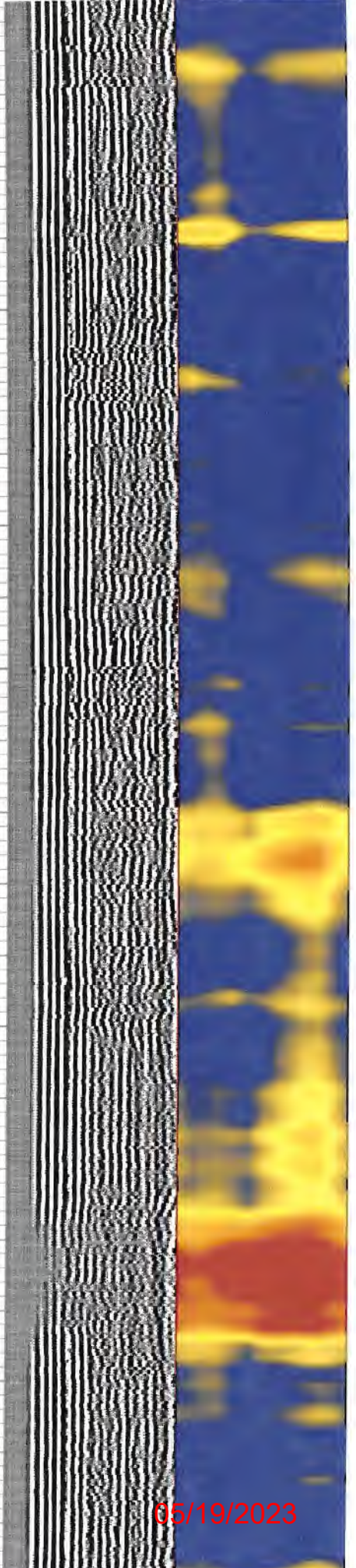
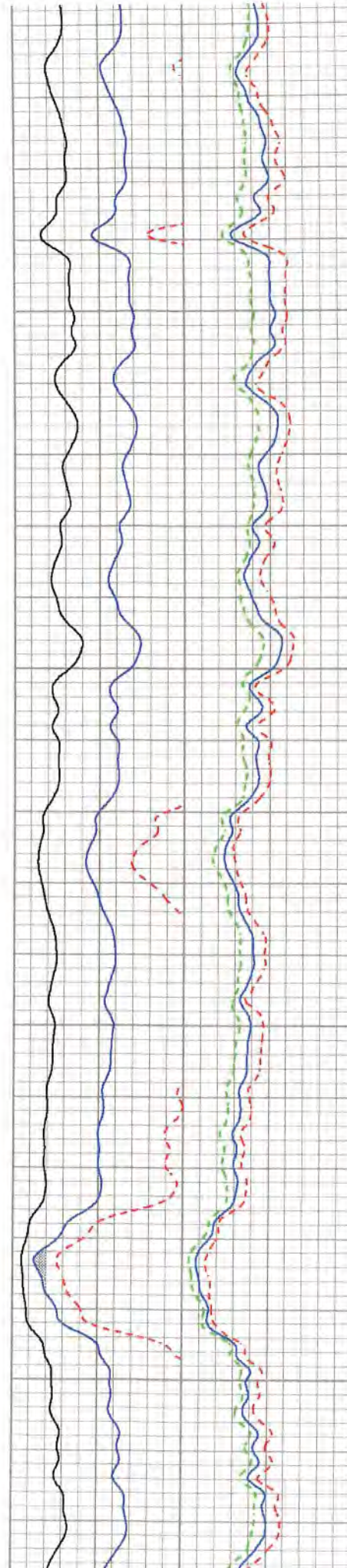


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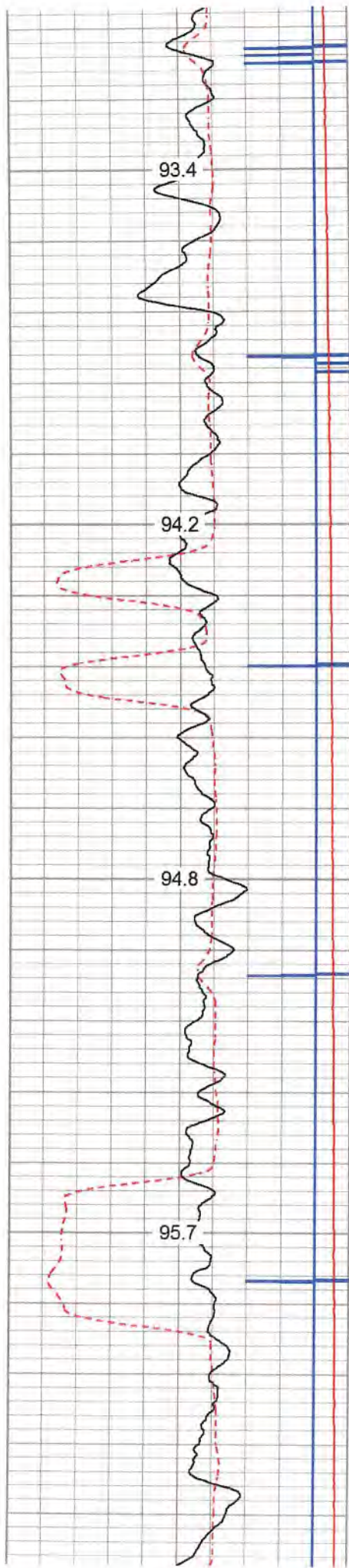
3800

3850

3900



05/19/2023

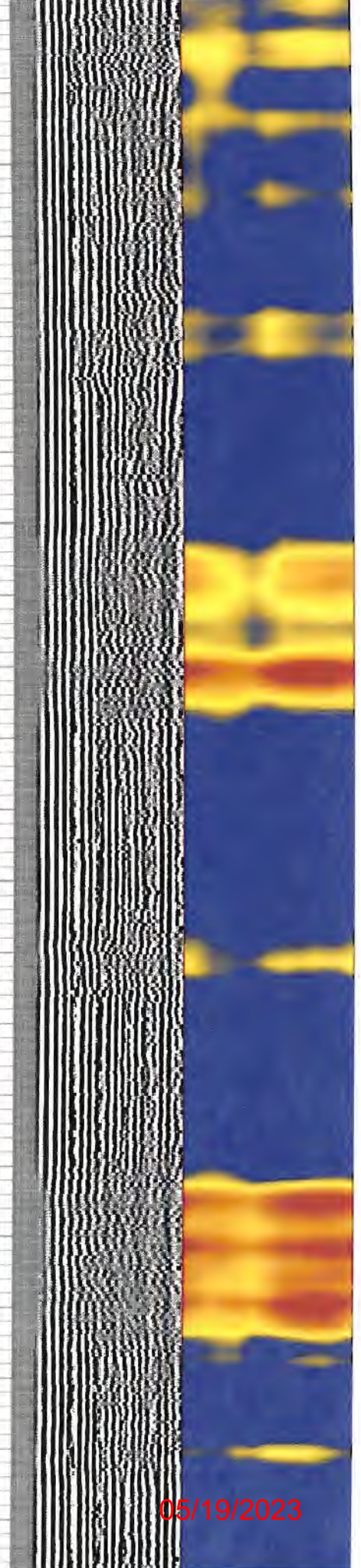
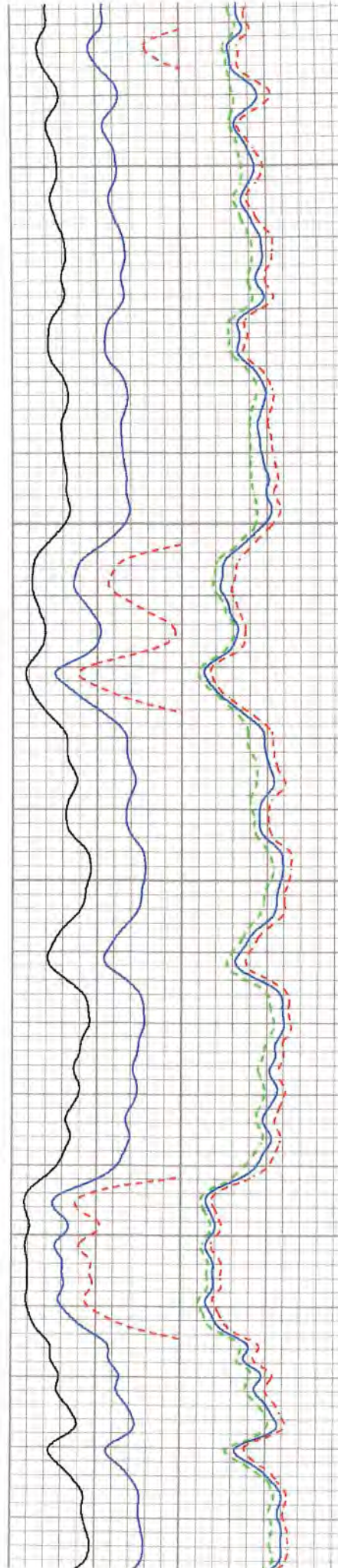


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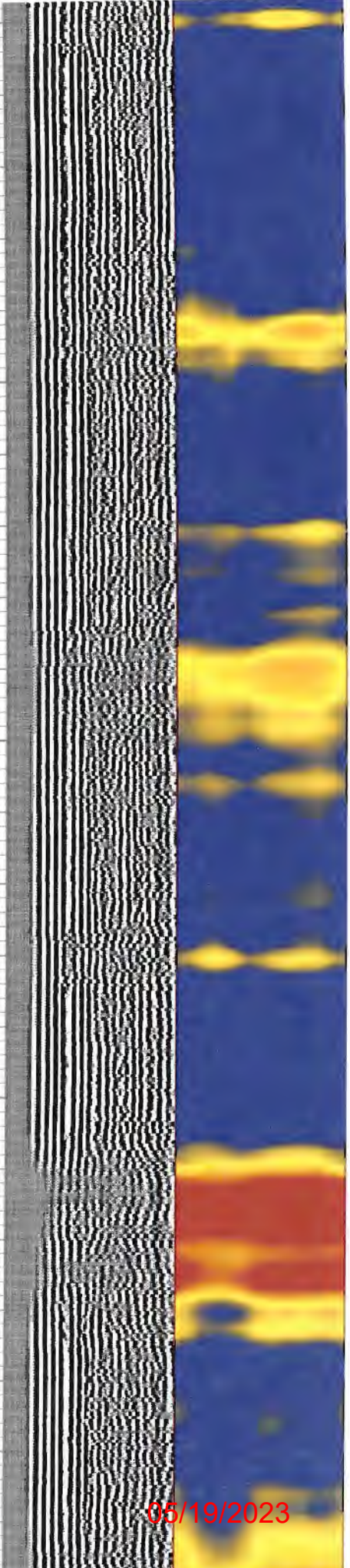
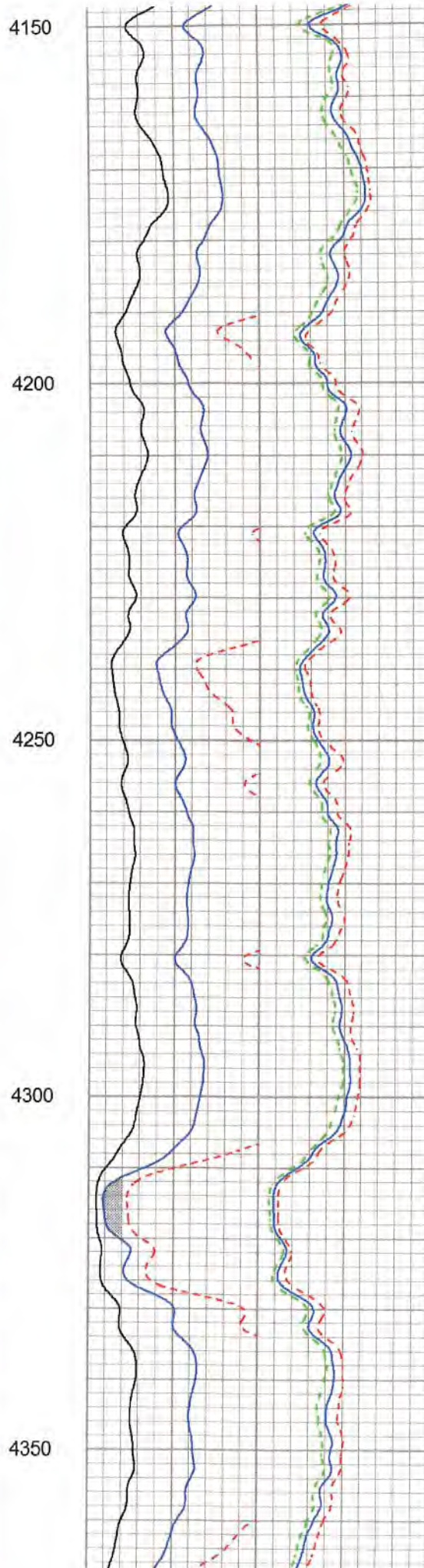
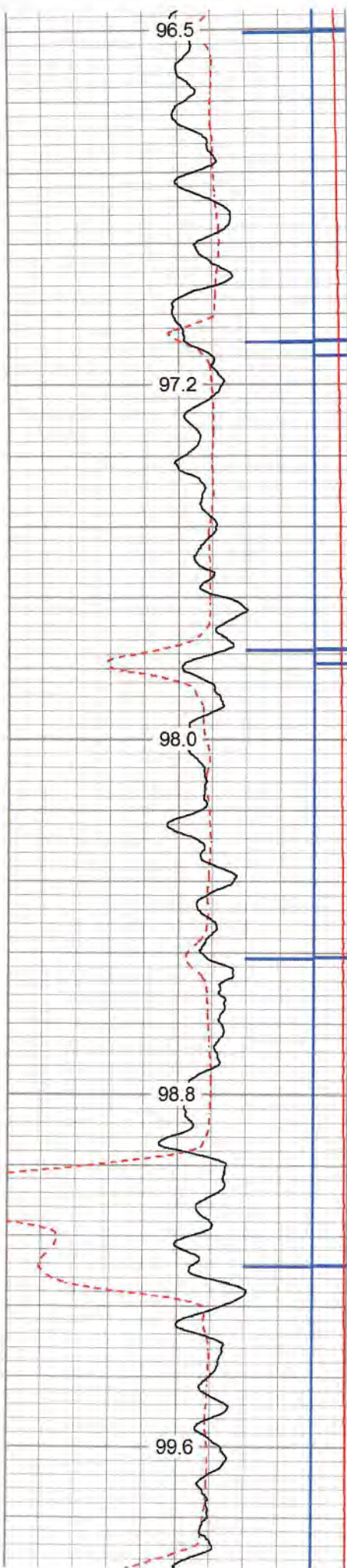
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4050

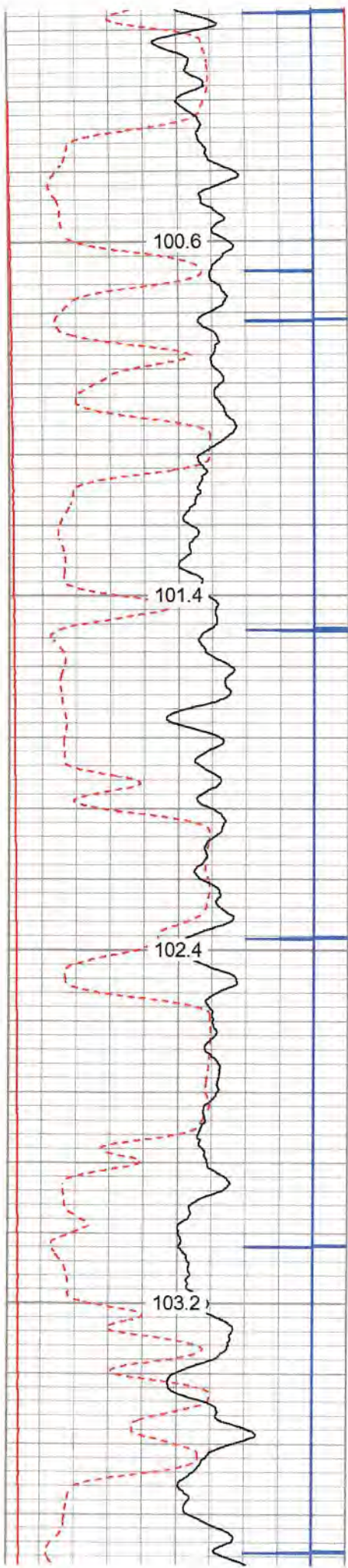
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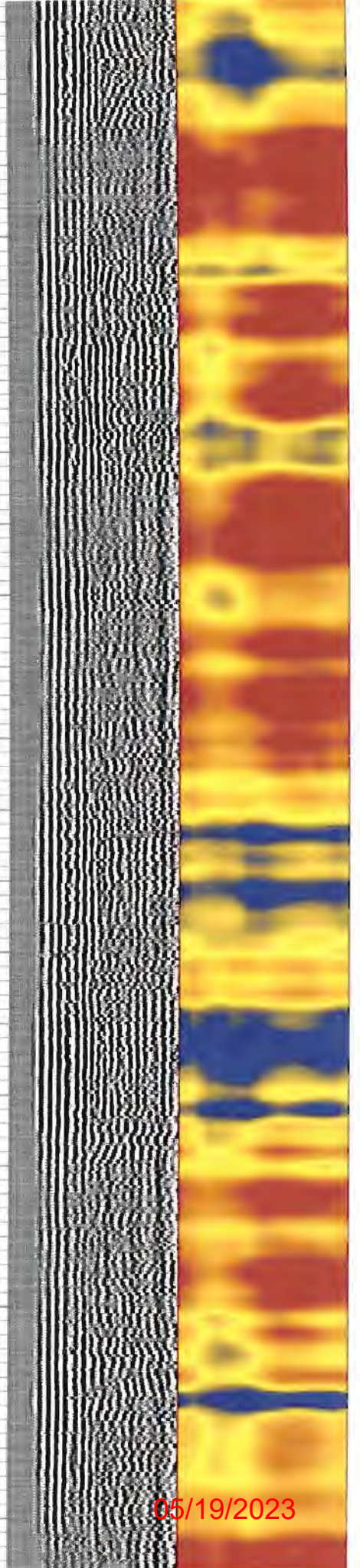
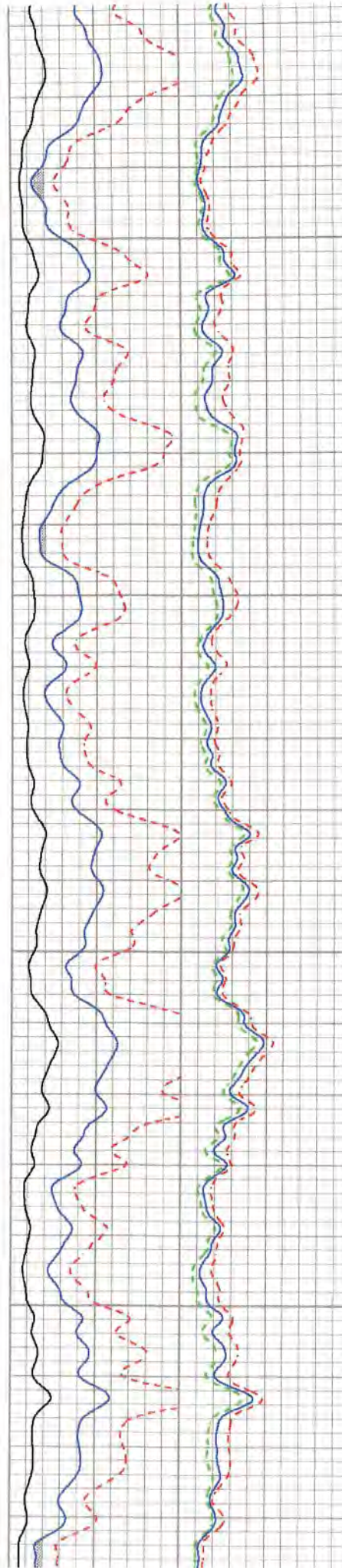


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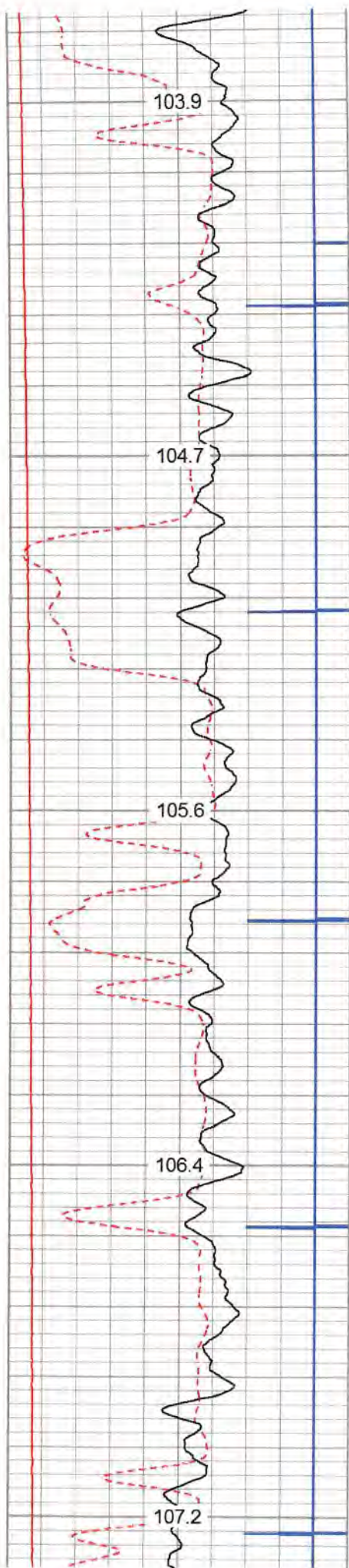
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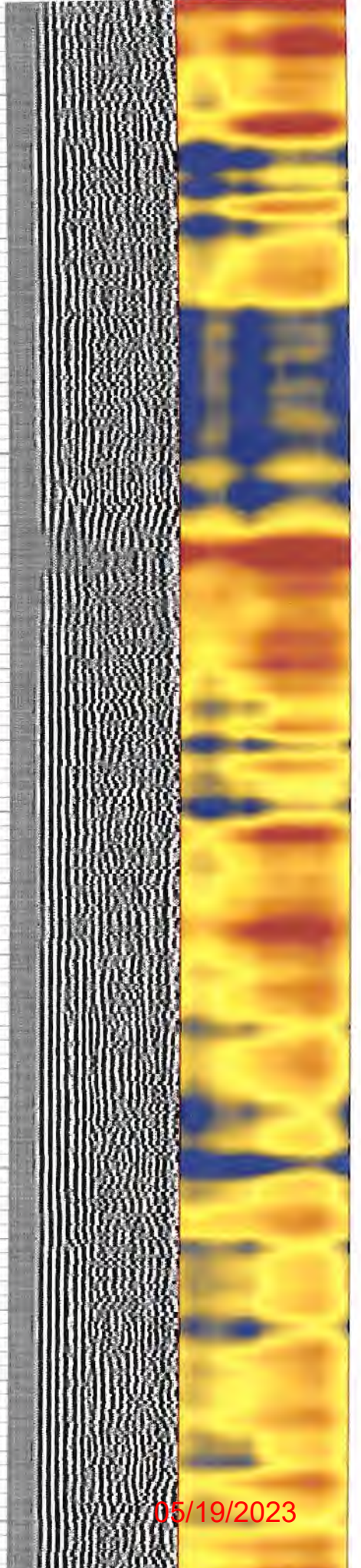
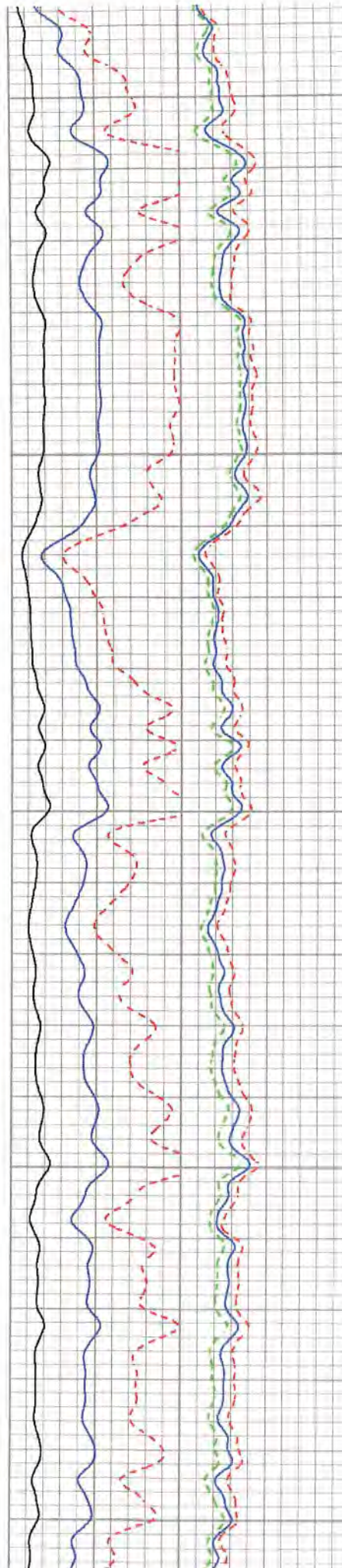
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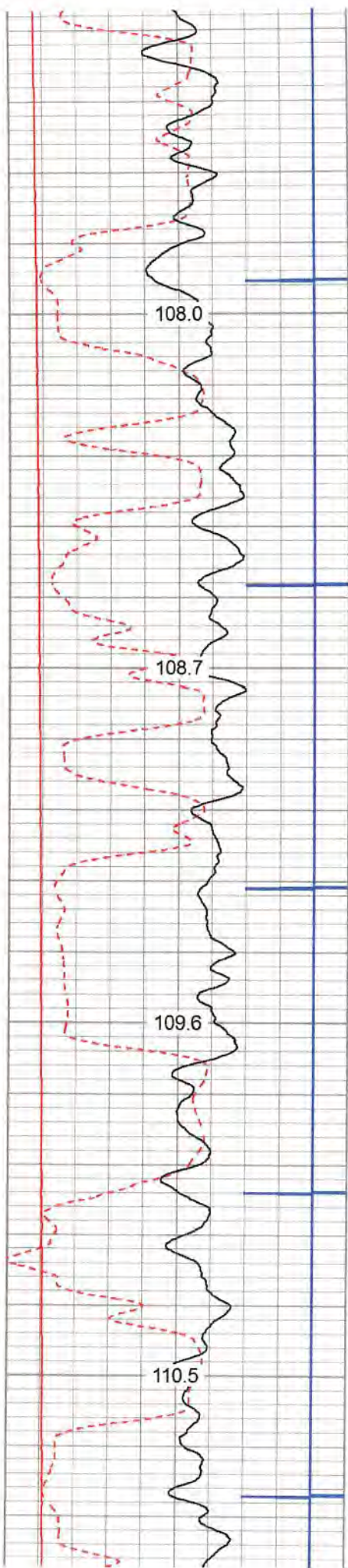
05/19/2023



4600
4650
4700
4750
4800



05/19/2023

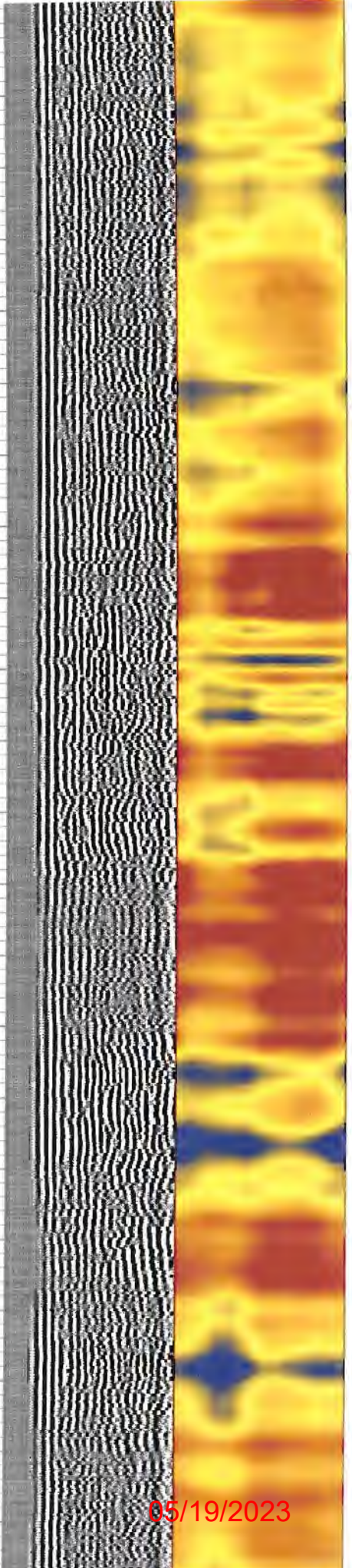
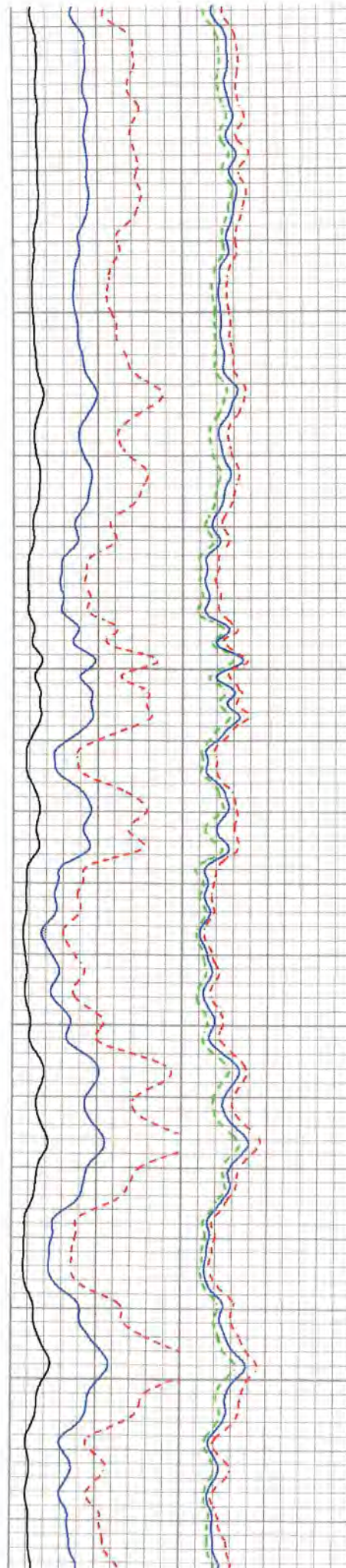


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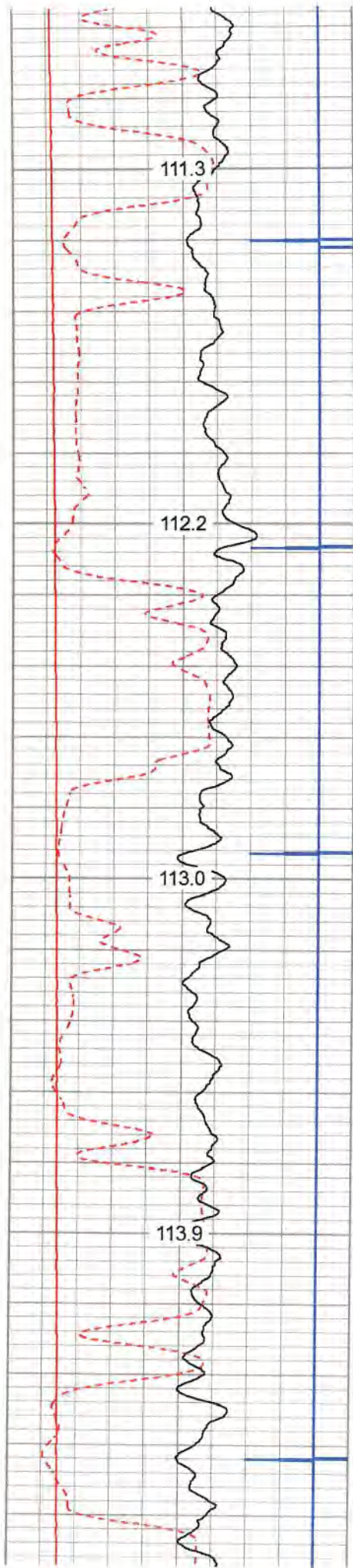
4900

4950

5000



05/19/2023

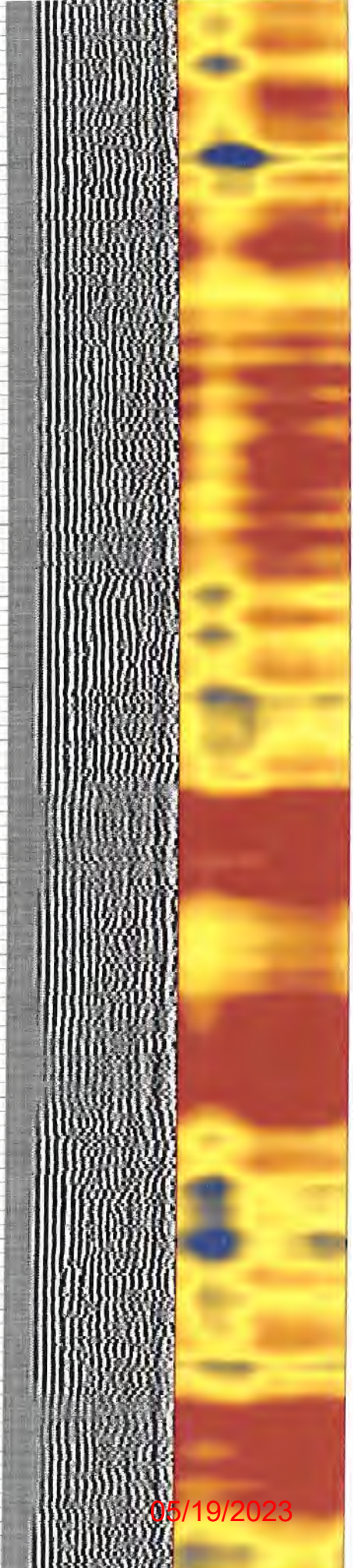
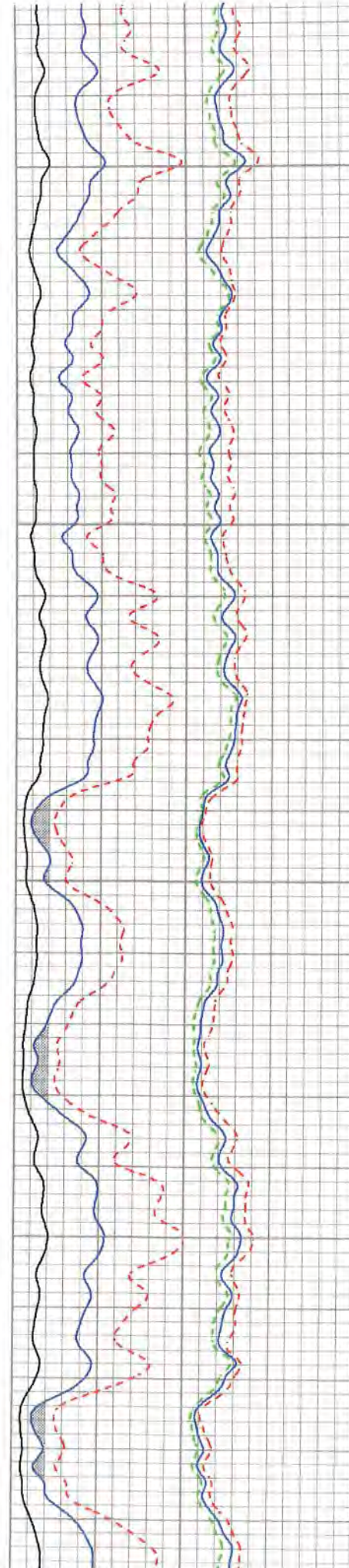


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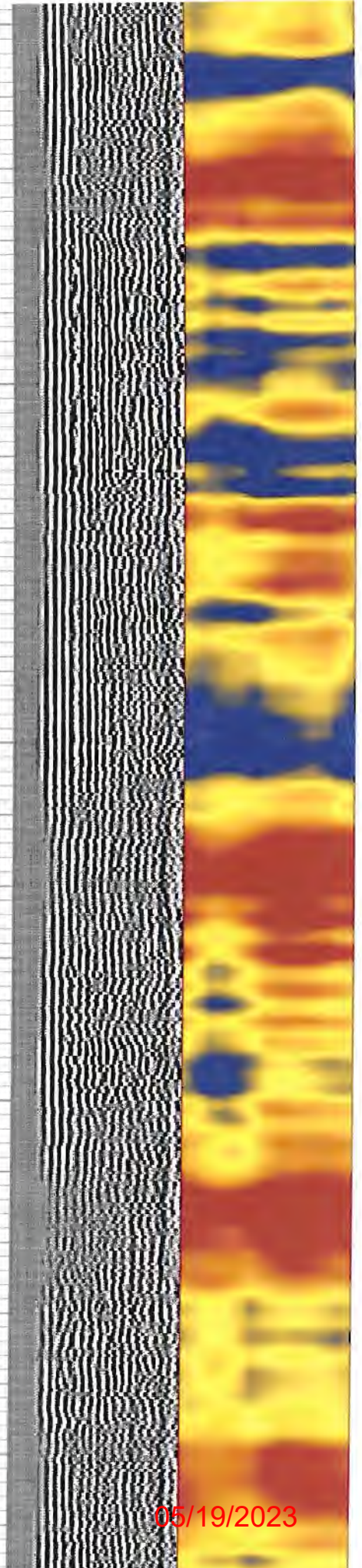
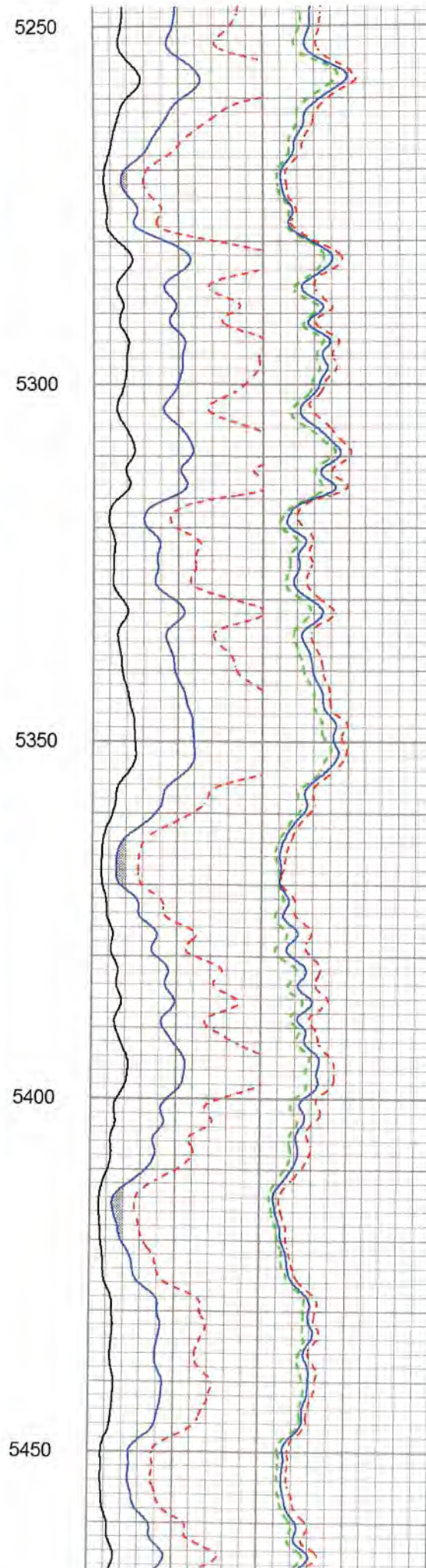
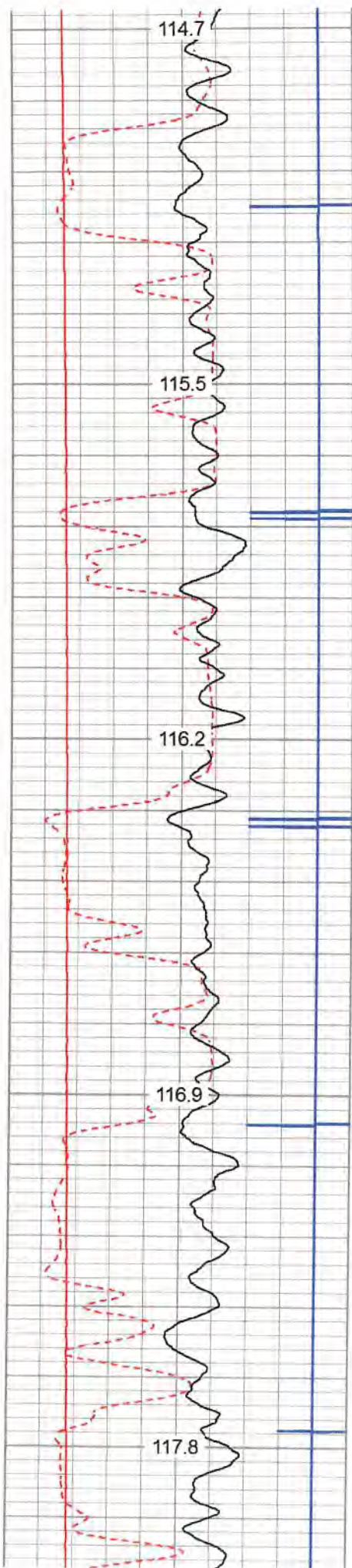
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5150

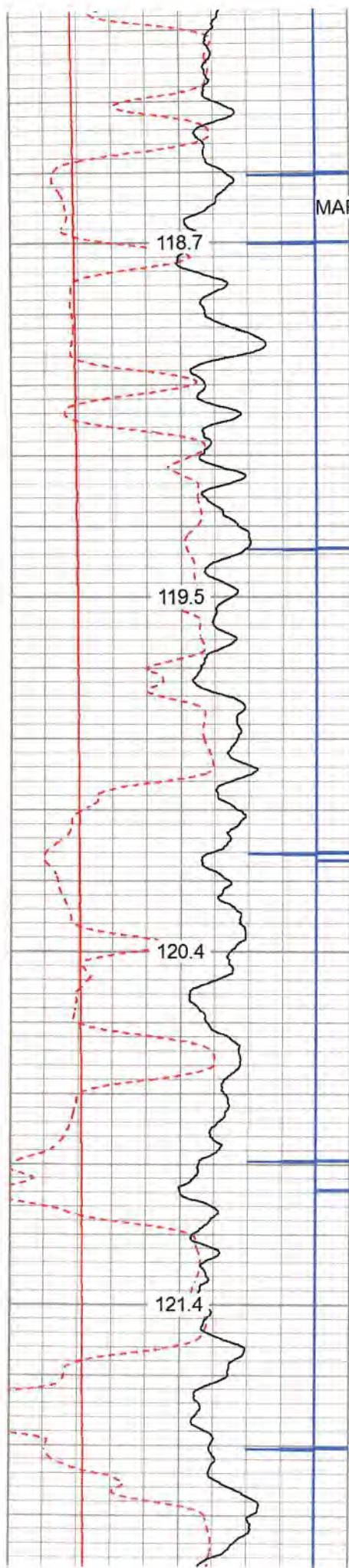
5200



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05/19/2023



MARKER JOINT

118.7

119.5

120.4

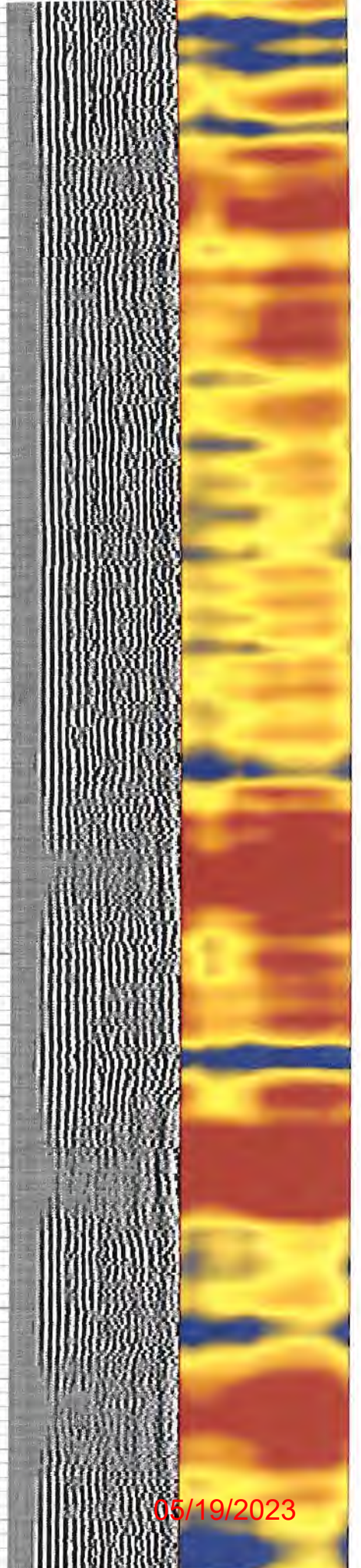
121.4

5500

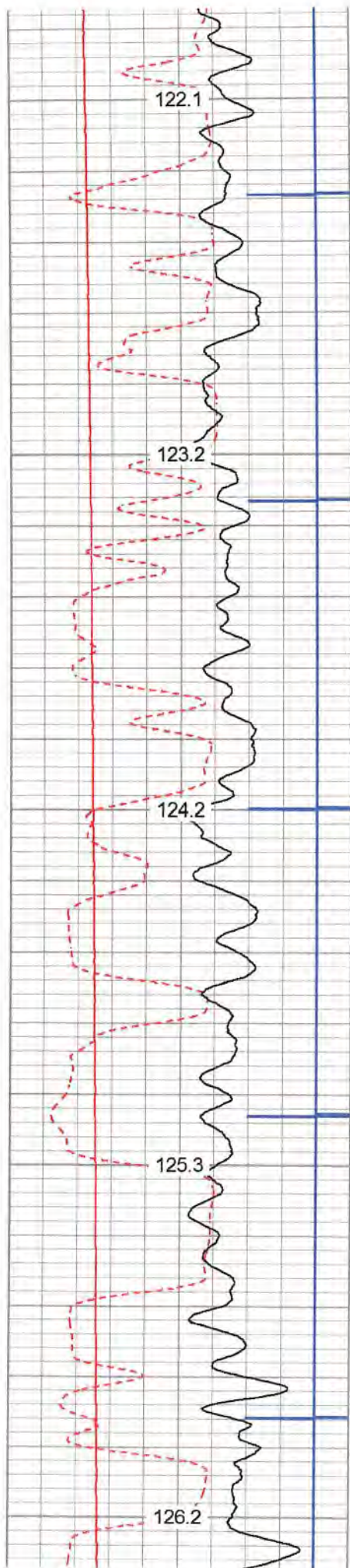
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5600

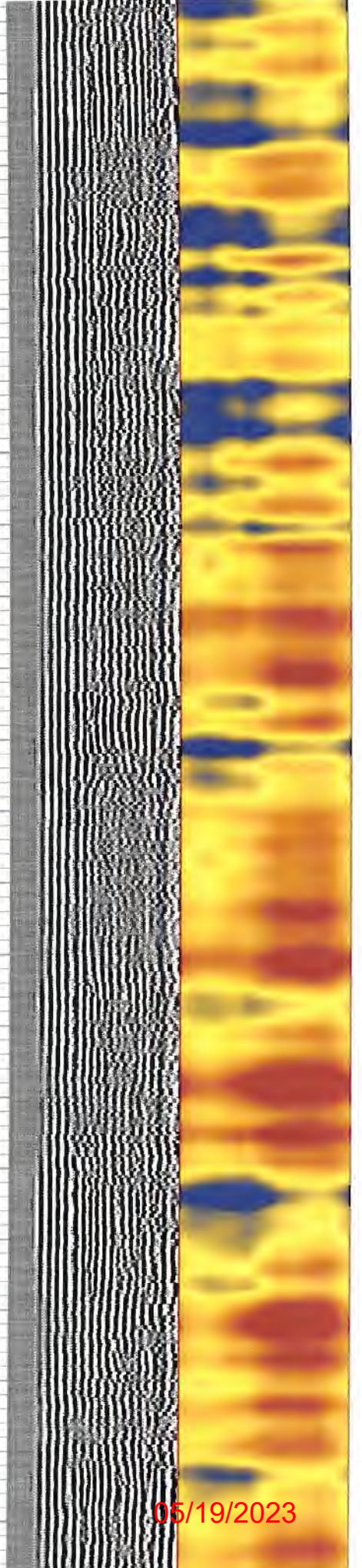
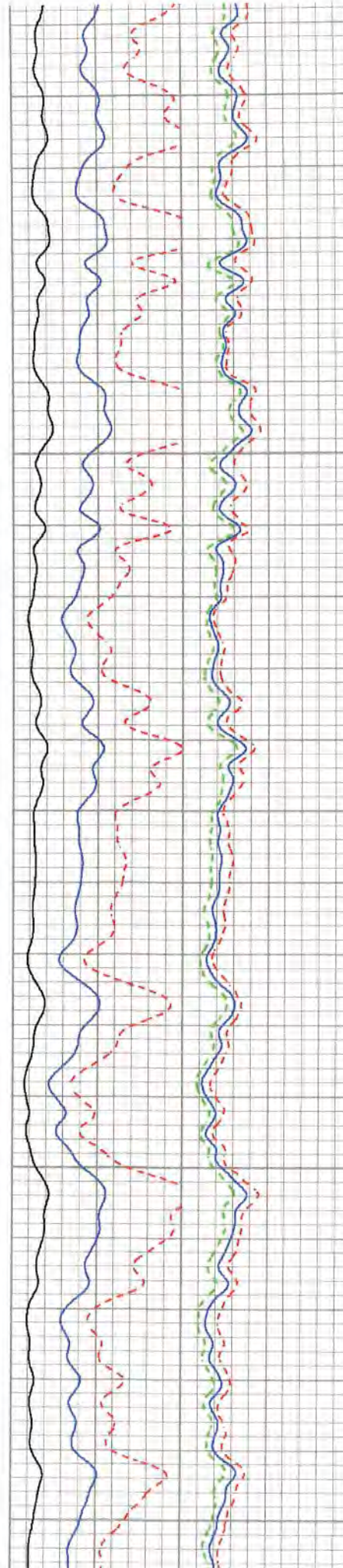
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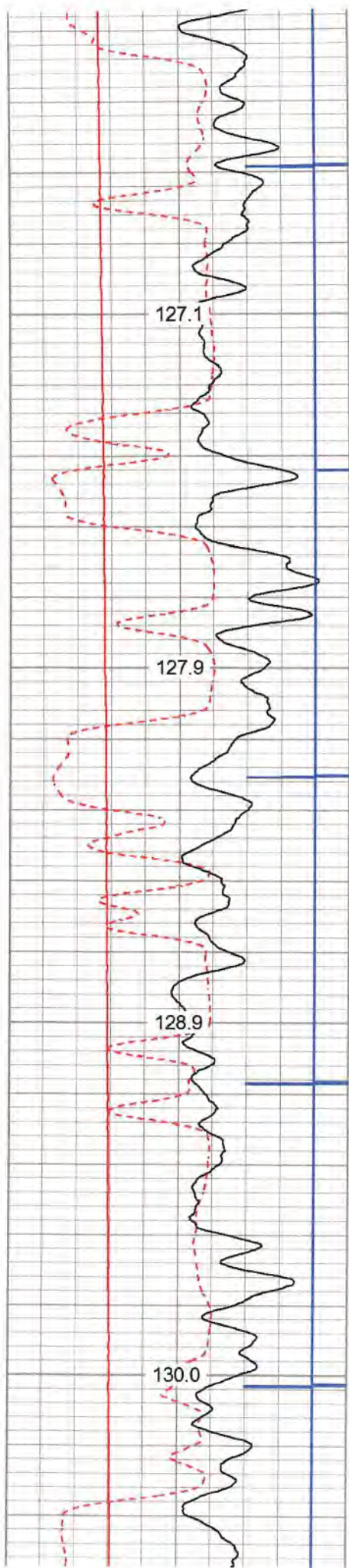
05/19/2023



5700
5750
5800
5850
5900



05/19/2023

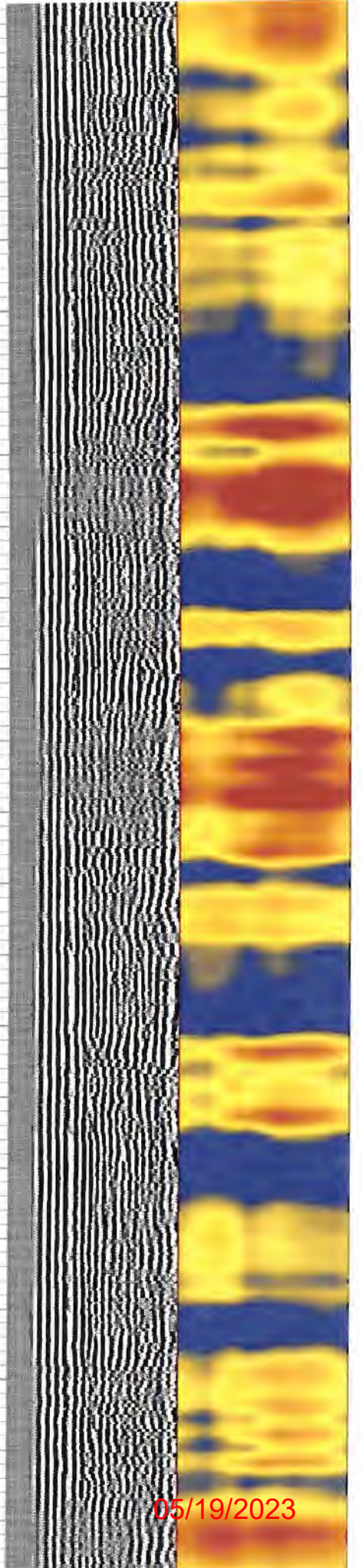
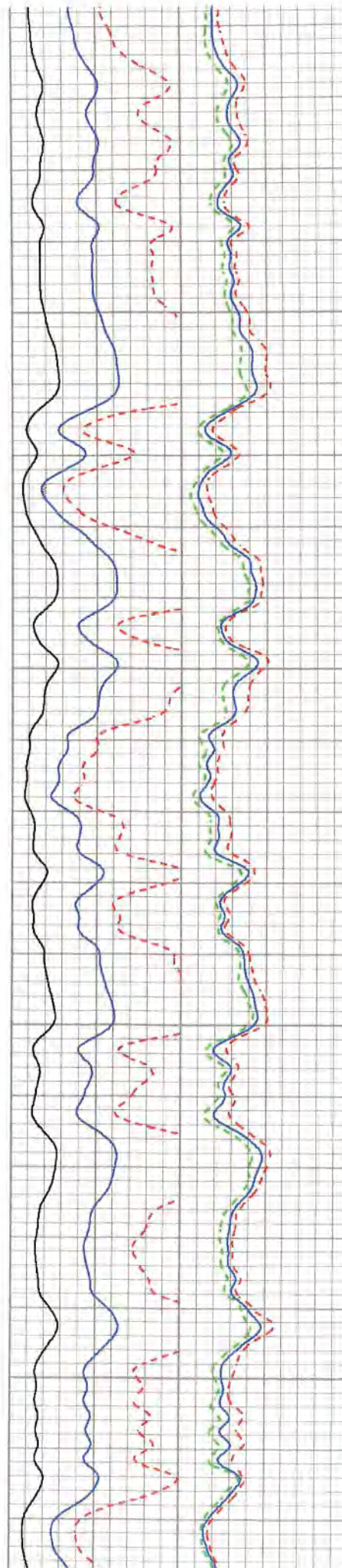


5950

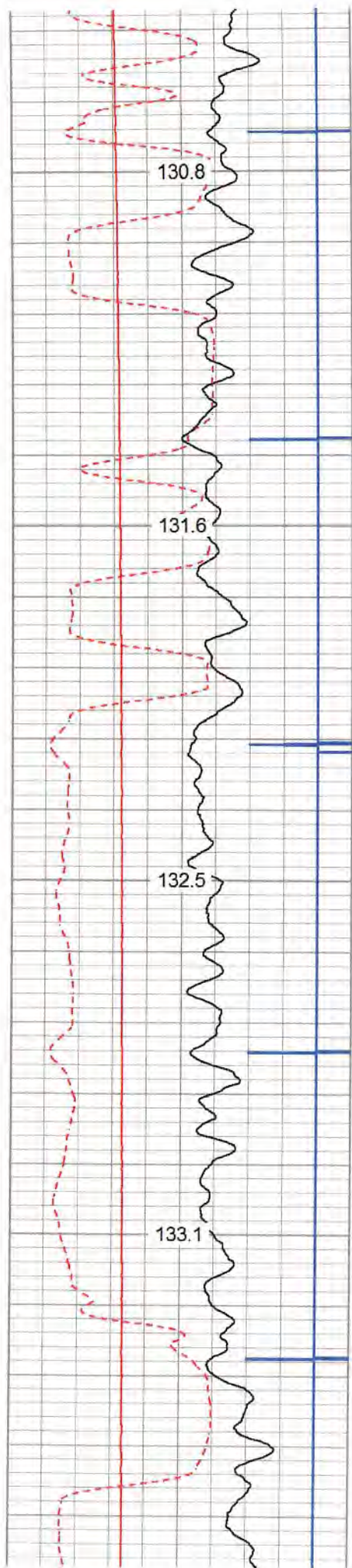
6000

6050

6100



05/19/2023

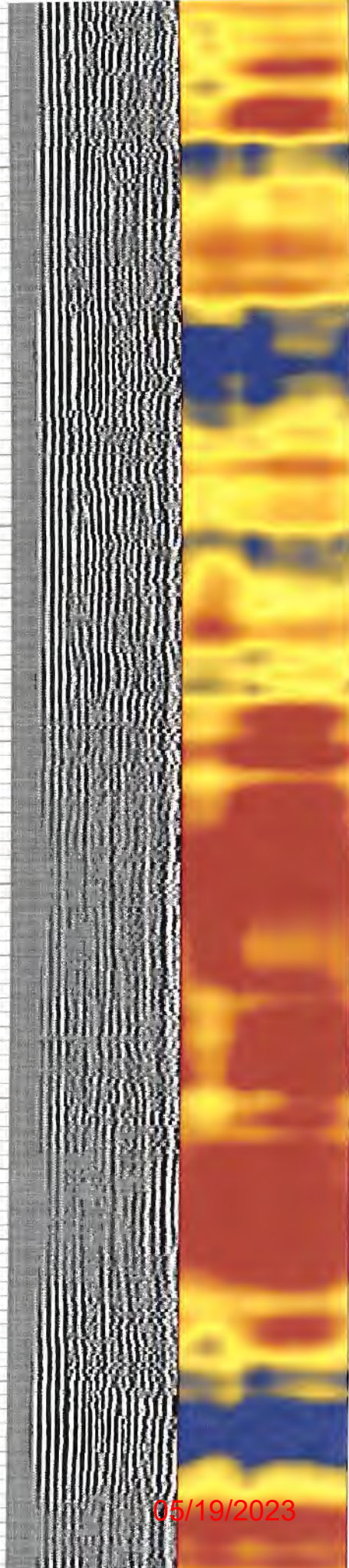
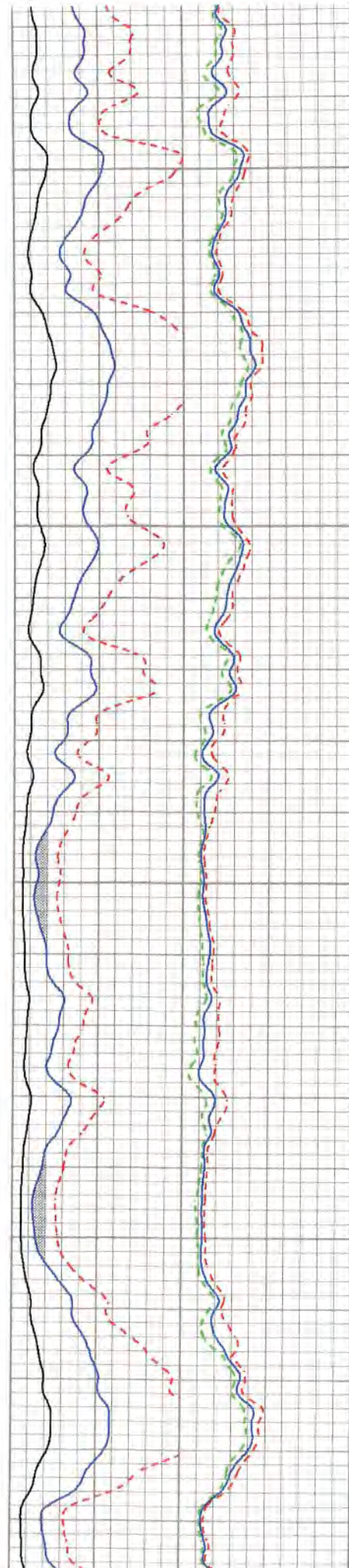


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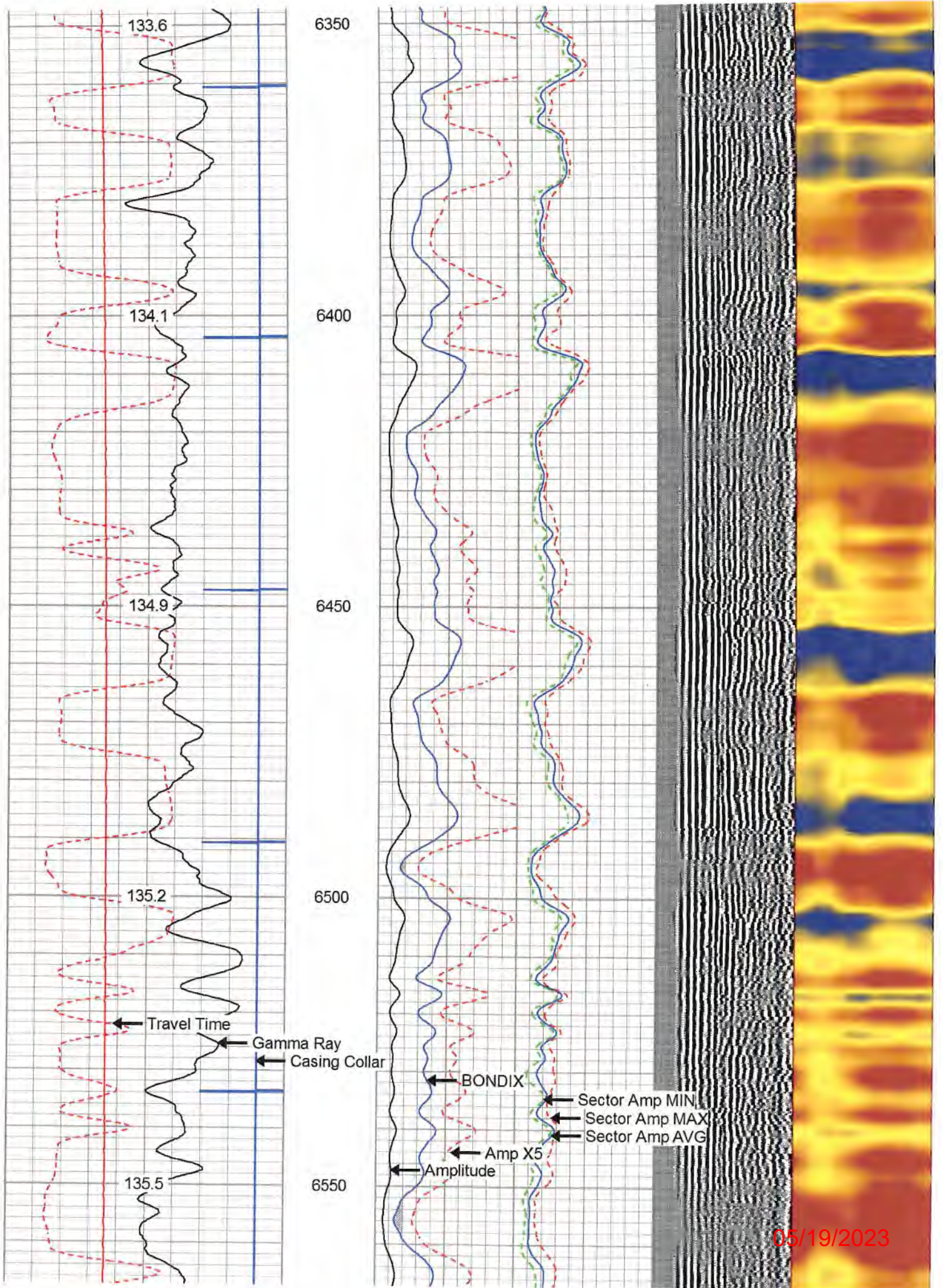
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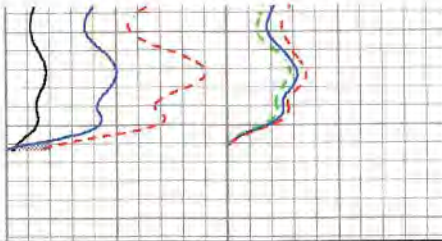
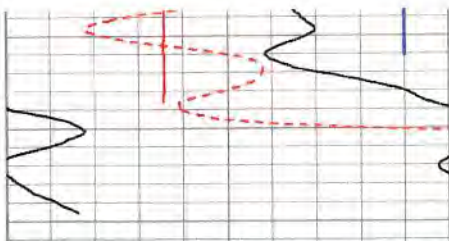
6250

6300



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280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

Amplitude	Sector Amp AVG	VDL	1	Sector Map	12
0 (mV) 100	Sector Amp MAX	200 (usec) 1200			
Amp X5	Sector Amp MIN				
0 (mV) 20					
1 BONDIX 0					

TEMP
(degF)



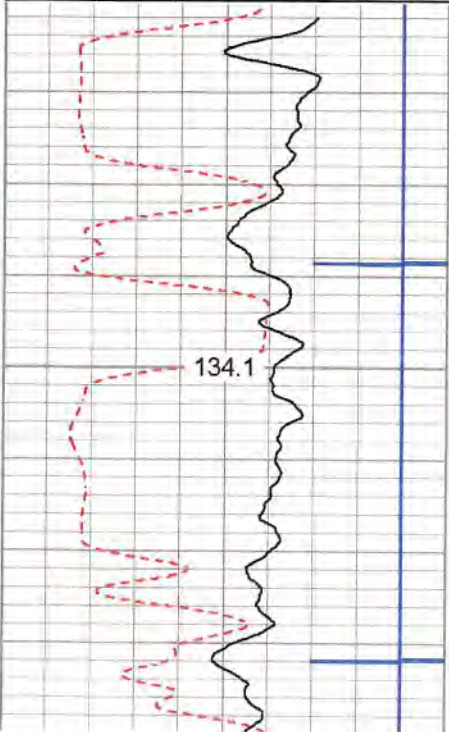
REPEAT PASS 1500 PSI

Database File g:\antero 2020\8_7_20_antero_garminunit1h.db
 Dataset Pathname pass6
 Presentation Format antero
 Dataset Creation Fri Aug 07 07:58:06 2020
 Charted by Depth in Feet scaled 1:240

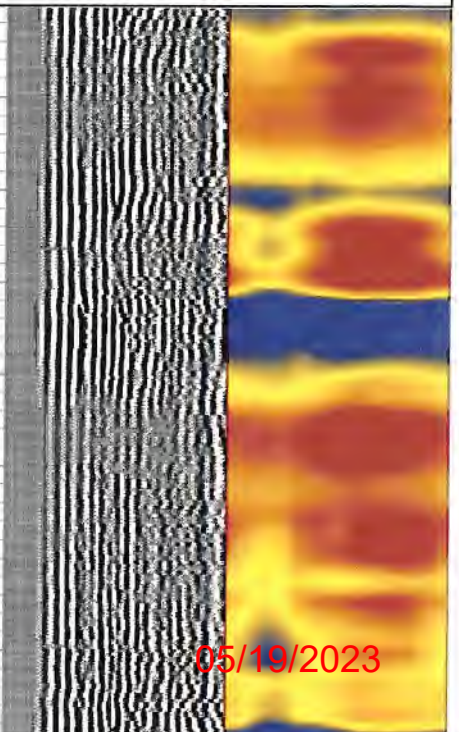
280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

Amplitude	Sector Amp AVG	VDL	1	Sector Map	12
0 (mV) 100	Sector Amp MAX	200 (usec) 1200			
Amp X5	Sector Amp MIN				
0 (mV) 20					
1 BONDIX 0					

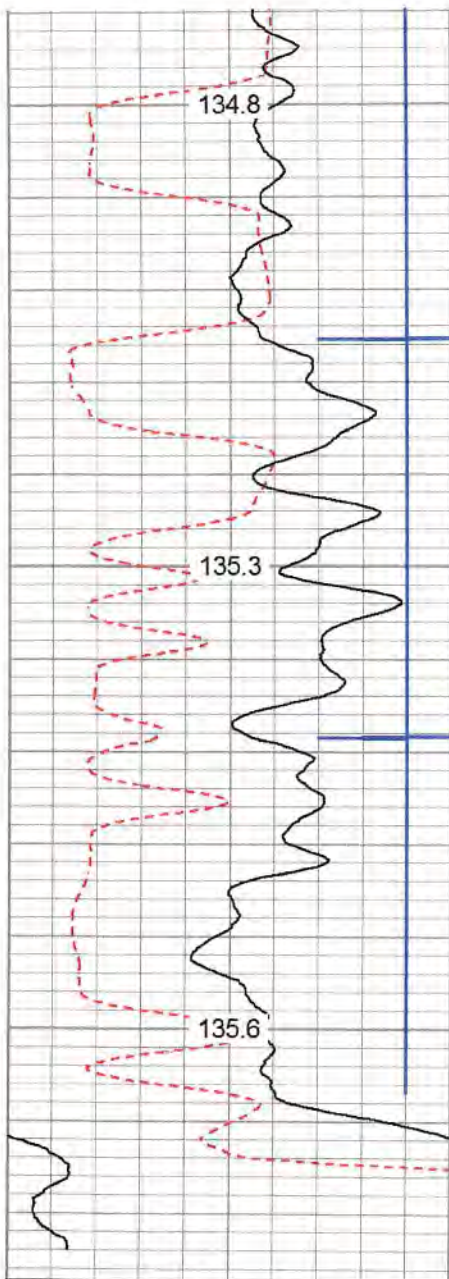
TEMP
(degF)



6400



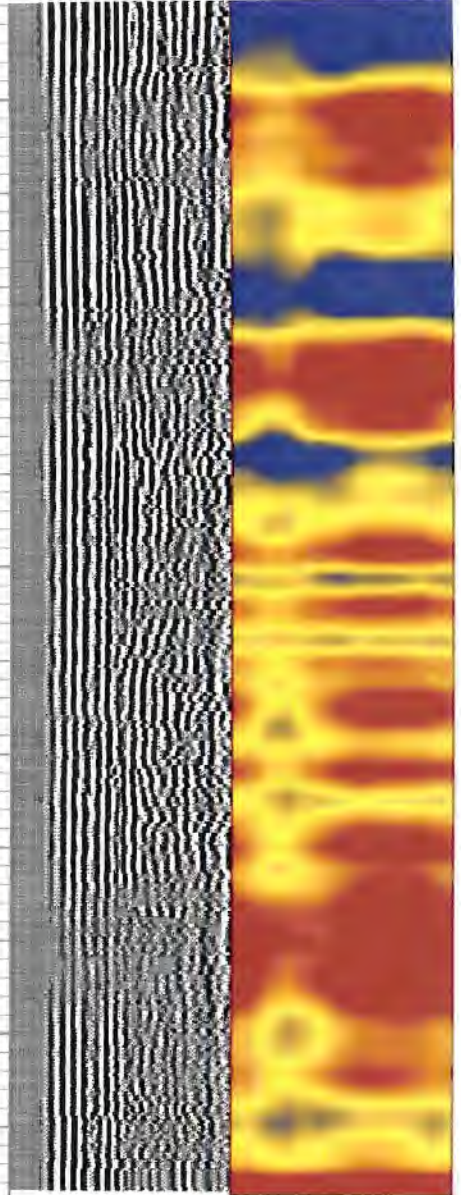
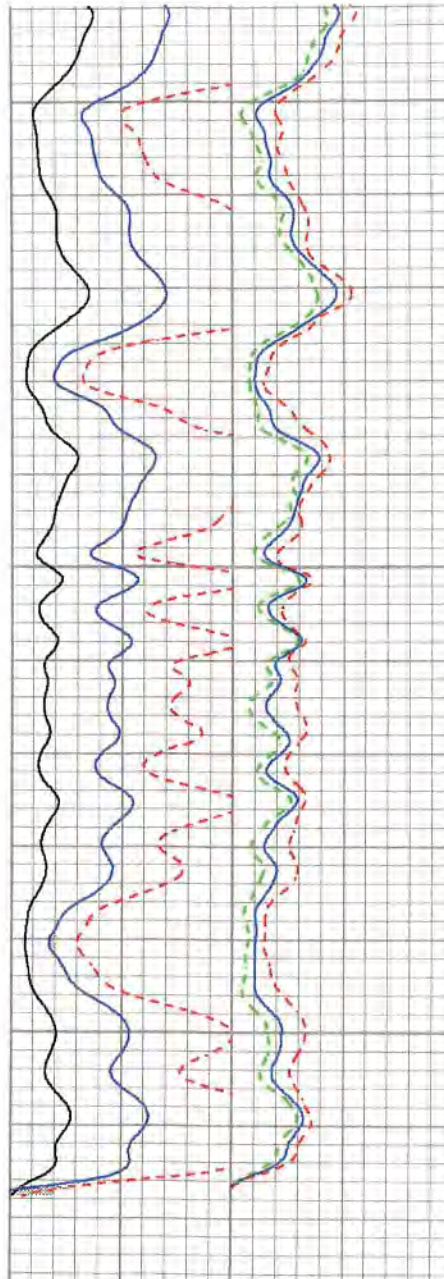
05/19/2023



6450

6500

6550




280	Travel Time (usec)	180
9	Casing Collar	-1
0	Gamma Ray	180
0	TEMP (degF)	100
180	GR	360

TEMP (degF)

Amplitude	Sector Amp AVG
0 (mV) 100	Sector Amp MAX
Amp X5	Sector Amp MIN
0 (mV) 20	
1 BONDIX 0	

VDL	1 Sector Map 12
200 (usec) 1200	



Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
CCL	20.30		CCL-312tekco (108X3-01) Tekco 3 1/8" 450 Deg. "F" SmCo Logging CCL	1.82	3.12	25.00
			Tek-3.125 3 1/8" Titan Adjustable Centralizer	3.42	3.13	50.00

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TEMP	13.46					
WVFS12	12.17					
WVFS11	12.17		SCBL-Tek12 (IOL40-03_5_5) Tekco 400 Deg F 12 Sector RIB with Temp	9.13	3.25	135.00
WVFS10	12.17					
WVFS9	12.17					
WVFS8	12.17					
WVFS7	12.17					
WVFS6	12.17					
WVFS5	12.17					
WVFS4	12.17					
WVFS3	12.17					
WVFS2	12.17					
WVFS1	12.17					
WVFCAL	11.42					
WVF3FT	11.42					
WVF5FT	10.42					
WVFSYNC	7.08					
WVFTEMP	7.08					
			Tek-3.125 3 1/8" Titan Adjustable Centralizer	3.42	3.13	50.00
			GR-Tek-Co 2 3/4 (IPSNO-03) Tekco 2 3/4" 400 Deg. F Logging Gamma Ray	3.67	2.75	40.00
GR	1.04					

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FEB 17 2023
WV Department of
Environmental Protection

Dataset: 8_7_20_antero_garminunit1h.db: field/well/run1/pass7.1
 Total length: 21.44 ft
 Total weight: 300.00 lb
 O.D.: 3.25 in

Calibration Report

Database File g:\antero 2020\8_7_20_antero_garminunit1h.db
 Dataset Pathname pass7.6
 Dataset Creation Fri Aug 07 18:27:20 2020

Gamma Ray Calibration Report

Serial Number: IPSNO-03
 Tool Model: Tek-Co 2 3/4
 Performed: Tue Nov 12 16:11:18 2019

05/19/2023

Calibrator Value: 1.0
 Background Reading: 0.0 cps
 Calibrator Reading: 1.0 cps
 Sensitivity: 0.5000 /cps

Segmented Cement Bond Log Calibration Report

Serial Number: IOL40-03_5_5
 Tool Model: Tek12
 Calibration Casing Diameter: 5.500 in
 Calibration Depth: 3099.233 ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	0.003	0.788	3.400	71.921	87.307	2.369
CAL	0.865	0.417				
5'	-0.001	0.834	3.400	71.921	82.081	3.472
SUM						
S1	0.071	2.080	3.400	100.000	48.079	-0.027
S2	0.081	1.977	3.400	100.000	50.927	-0.708
S3	0.092	2.001	3.400	100.000	50.586	-1.238
S4	0.094	2.065	3.400	100.000	49.018	-1.220
S5	0.086	2.121	3.400	100.000	47.472	-0.692
S6	0.079	2.217	3.400	100.000	45.183	-0.192
S7	0.070	2.189	3.400	100.000	45.596	0.201
S8	0.070	2.115	3.400	100.000	47.242	0.090
S9	0.071	2.113	3.400	100.000	47.303	0.033
S10	0.071	2.102	3.400	100.000	47.564	0.004
S11	0.067	2.050	3.400	100.000	48.697	0.158
S12	0.062	2.122	3.400	100.000	46.898	0.474

Temperature Calibration Report

Serial Number: IOL40-03_5_5
 Tool Model: Tek12
 Performed: Fri Oct 20 09:51:21 2017

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FEB 17 2023

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Environmental Protection

	Reference	Reading
Low Reference:	0.00 degF	0.00 usec
High Reference:	1.00 degF	1.00 usec
Gain:	0.33	
Offset:	0.00	
Delta Spacing	2	



Company ANTERO RESOURCES CORPORATION
 Well GARMIN UNIT 1H
 Field MARCELLUS
 County TYLER
 State WV
 Country US

05/19/2023