



Environmental GEO-Technologies, LLC

April 30, 2019

Mr. Allan Batka
United States Environmental Protection Agency
Region 5 (WU-16J)
77 West Jackson Blvd.
Chicago, Illinois 60604

Re: EGT Monthly Report (in conformance with MI-163-1W-C010 & MI-163-1W-C011)

Dear Mr. Batka:

Environmental Geo-Technologies, LLC ("EGT") hereby timely submits its sixty-fifth Monthly Report ("MR") in conformance with the requirements of its two EPA UIC permits (#s MI-163-1W-C010 & MI-163-1W-C011).

EGT is providing all of the attached information in the same sequence as required by both subject permits, i.e. Part II.D.1 (a-i), Part III, Attachment A, and Part III, Attachment E.G.2 & E.I.

EGT did not accept any F039 waste in March, 2019 so no Page A-3 of 3 laboratory analyses are necessary to be submitted as part of this MR.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

We trust that you find this report satisfactory, however, if you have any questions or comments, please feel free to contact us.

Sincerely,

Richard J. Powals, P.E.

cc: J. Frost (EGT)

att.

rjp043019/EGTEPAMonthlyReport-March, 2019

AVERAGE INJECTION RATE

Calculation of Average Injection Rate

CURRENT REPORTING YEAR 2019

CURRENT REPORTING MONTH MARCH

Date (month, year) of the first injection into either well at the Citrin Road Facility

Nov 2013

CURRENT MONTH (all volumes in gallons)

	Injected Waste	Injected Non-Waste	Total injected
MI-163-1W-C010, Well #1-12			
Current Month	39,353	0	39,353
Since facility first injected			14,369,858
MI-163-1W-C011, Well #2-12			
Current Month	0	0	0
Since facility first injected			4,648,736
		Lifetime Combined	19,018,594

Conversion factors

365.25 days per year ÷ 12 months per year = 30.4375 days per month

30.4375 days per month × 1440 minutes per day = 43,830 minutes per month

Calculations

Whole number of months of injection 63

$$\underline{\hspace{2cm}} \text{ lifetime number of months of injection} \times 43,830 \text{ minutes/month} = \underline{2,761,290} \text{ minutes of injection}$$

$$\text{Lifetime combined injected volume } \underline{19,018,594} \div \underline{2,761,290} \text{ minutes of injection} = \underline{6.9} \text{ gpm average injection rate}$$

WELL 1 DATA

WELL 01 Monthly Data

Date	Min Injection Pressure (PSIG)	Max Injection Pressure (PSIG)	Min Sight Glass Level (in)	Max Sight Glass Level (in)	Min Annulus Pressure (PSIG)	Max Annulus Pressure (PSIG)	Min Injectate pH	Max Injectate pH	Min Flow Rate (GPM)	Max Flow Rate (GPM)	Min Differential Pressure (PSIG)	Max Differential Pressure (PSIG)
3/1/2019	106.2	106.7	-0.9	-0.4	829.0	829.3	8.2	8.2	0.0	0.0	722.6	722.8
3/2/2019	106.7	107.2	-0.4	0.2	829.3	829.5	8.2	8.2	0.0	0.0	722.3	722.6
3/3/2019	107.2	107.7	0.2	0.7	829.5	829.8	8.2	8.2	0.0	0.0	722.1	722.3
3/4/2019	107.7	108.2	0.7	1.2	829.8	830.1	8.2	8.2	0.0	0.0	721.9	722.1
3/5/2019	108.2	108.6	1.2	1.8	830.1	830.3	8.2	8.2	0.0	0.0	721.7	721.9
3/6/2019	108.6	109.1	1.8	2.3	830.3	830.6	8.2	8.2	0.0	0.0	721.5	721.7
3/7/2019	109.1	109.6	2.3	2.8	830.6	830.8	8.2	8.2	0.0	0.0	721.3	721.5
3/8/2019	109.6	899.3	2.8	3.4	830.8	1189.2	6.2	6.2	0.0	19.5	289.9	721.3
3/9/2019	110.1	110.5	3.4	3.9	831.1	831.4	6.2	6.2	0.0	0.0	720.8	721.1
3/10/2019	110.5	111.0	3.9	4.4	831.4	831.6	6.2	6.2	0.0	0.0	720.6	720.8
3/11/2019	111.0	901.8	4.4	5.0	831.6	1197.1	6.2	6.2	0.0	21.3	295.3	720.6
3/12/2019	111.5	900.5	5.0	5.5	831.9	1196.6	6.2	6.2	0.0	21.1	296.1	720.4
3/13/2019	111.9	112.4	5.5	6.0	832.1	832.4	6.2	6.2	0.0	0.0	720.0	720.2
3/14/2019	112.4	898.7	6.0	6.6	832.4	1189.7	6.6	6.6	0.0	19.4	291.2	719.8
3/15/2019	112.9	908.4	6.6	7.1	832.7	1199.6	6.6	6.6	0.0	21.7	291.2	719.8
3/16/2019	113.4	113.8	7.1	7.6	832.9	833.2	6.6	6.6	0.0	0.0	719.4	719.6
3/17/2019	113.8	114.3	7.6	8.2	833.2	833.5	6.6	6.6	0.0	0.0	719.1	719.4
3/18/2019	114.3	878.6	8.2	8.7	833.5	1159.1	6.6	6.6	0.0	18.2	280.5	719.1
3/19/2019	114.8	115.3	8.7	9.3	833.7	834.0	6.6	6.6	0.0	0.0	718.7	718.9
3/20/2019	115.3	115.7	9.3	9.8	834.0	834.2	6.6	6.6	0.0	0.0	718.5	718.7
3/21/2019	115.7	116.2	9.8	10.3	834.2	834.5	6.6	6.6	0.0	0.0	718.3	718.5
3/22/2019	116.2	116.7	10.3	10.9	834.5	834.8	6.6	6.6	0.0	0.0	718.1	718.3
3/23/2019	116.7	117.2	10.9	11.4	834.8	835.0	6.6	6.6	0.0	0.0	717.9	718.1
3/24/2019	117.2	117.6	11.4	11.9	831.7	831.7	6.6	6.6	0.0	0.0	717.6	717.9
3/25/2019	117.6	892.8	11.9	12.5	835.3	1187.3	6.4	6.4	0.0	19.0	294.5	717.6
3/26/2019	118.1	864.5	12.5	13.0	835.6	1162.1	6.4	6.4	0.0	18.1	297.6	717.4
3/27/2019	118.6	119.1	13.0	13.5	835.8	836.1	6.4	6.4	0.0	0.0	717.0	717.2
3/28/2019	119.1	119.5	13.5	14.1	836.1	836.3	6.4	6.4	0.0	0.0	716.8	717.0
3/29/2019	119.5	120.0	14.1	14.6	836.3	836.6	6.4	6.4	0.0	0.0	716.6	716.8
3/30/2019	120.0	120.5	14.6	15.2	836.6	836.9	6.4	6.4	0.0	0.0	716.4	716.6

Circle Chart Index

Environmental Geo-Technologies, LLC 28470 Citrin Drive Romulus, MI 48174

Chart Recorder #1

Channel #1

Blue Pen - Well 1 Injection Pressure (chart value x 30)

Channel #2

Red Pen - Well 1 Annulus Pressure (chart value x 30)

Channel #3

Green Pen - Well 1 Flow Rate (chart value x 4)

Channel #4

Black Pen - Well 1 Annulus Tank Level (chart value x 0)

Chart Recorder #2

Channel #1

Blue Pen - Well 2 Injection Pressure (chart value x 30)

Channel #2

Red Pen - Well 2 Annulus Pressure (chart value x 30)

Channel #3

Green Pen - Well 2 Flow Rate (chart value x 4)

Channel #4

Black Pen - Well 2 Annulus Tank Level (chart value x 0)

Chart Recorder #3

Channel #1

Blue Pen - Injection pH Well 1 & 2 (chart value + 3.3)

Channel #2

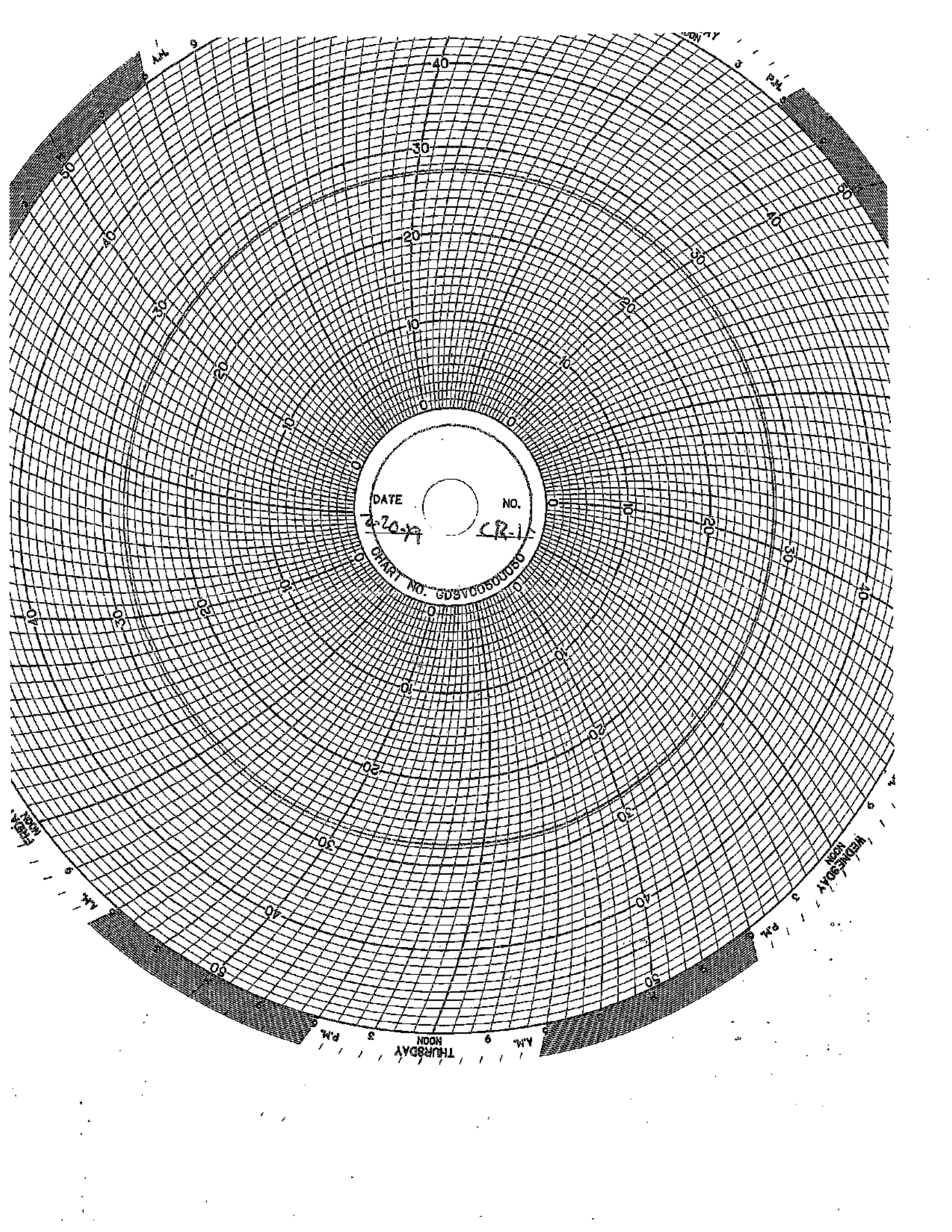
Red Pen - Well 1 Monthly Volume (chart value x 100,000)

Channel #3

Green Pen - Well 2 Monthly Volume (chart value x 100,000)

Channel #4

Black Pen - Temperature (chart value x 0)

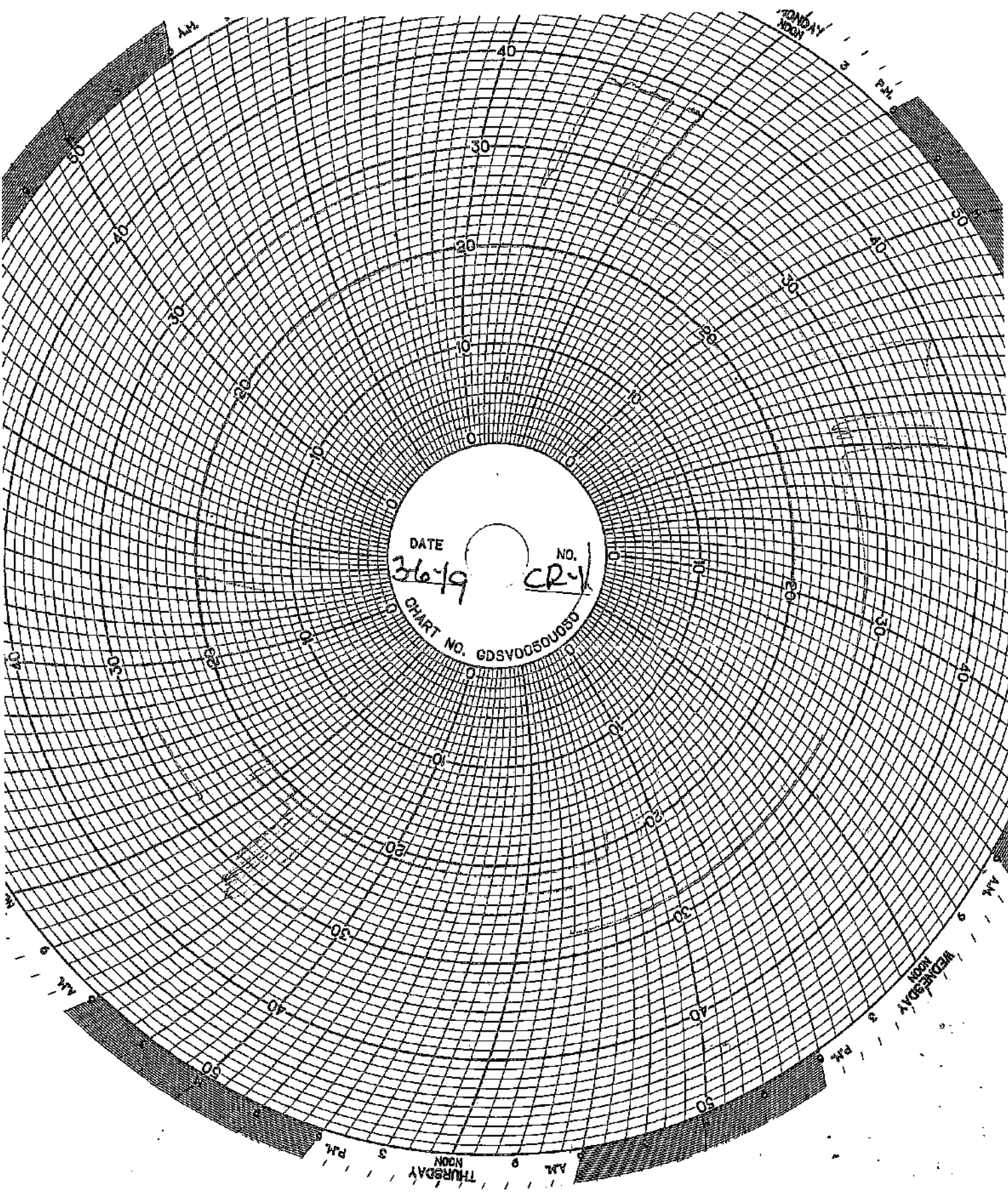


DATE NO.

4-20-79 CR-1

CHART NO. GDSY00500050

THURSDAY 9 AM 3 PM
WEDNESDAY 9 AM 3 PM
NOON



DATE 3-6-19 No. CR-4
CHART NO. GDSV0050U050

MONDAY
NOON

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P.M.

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WEDNESDAY
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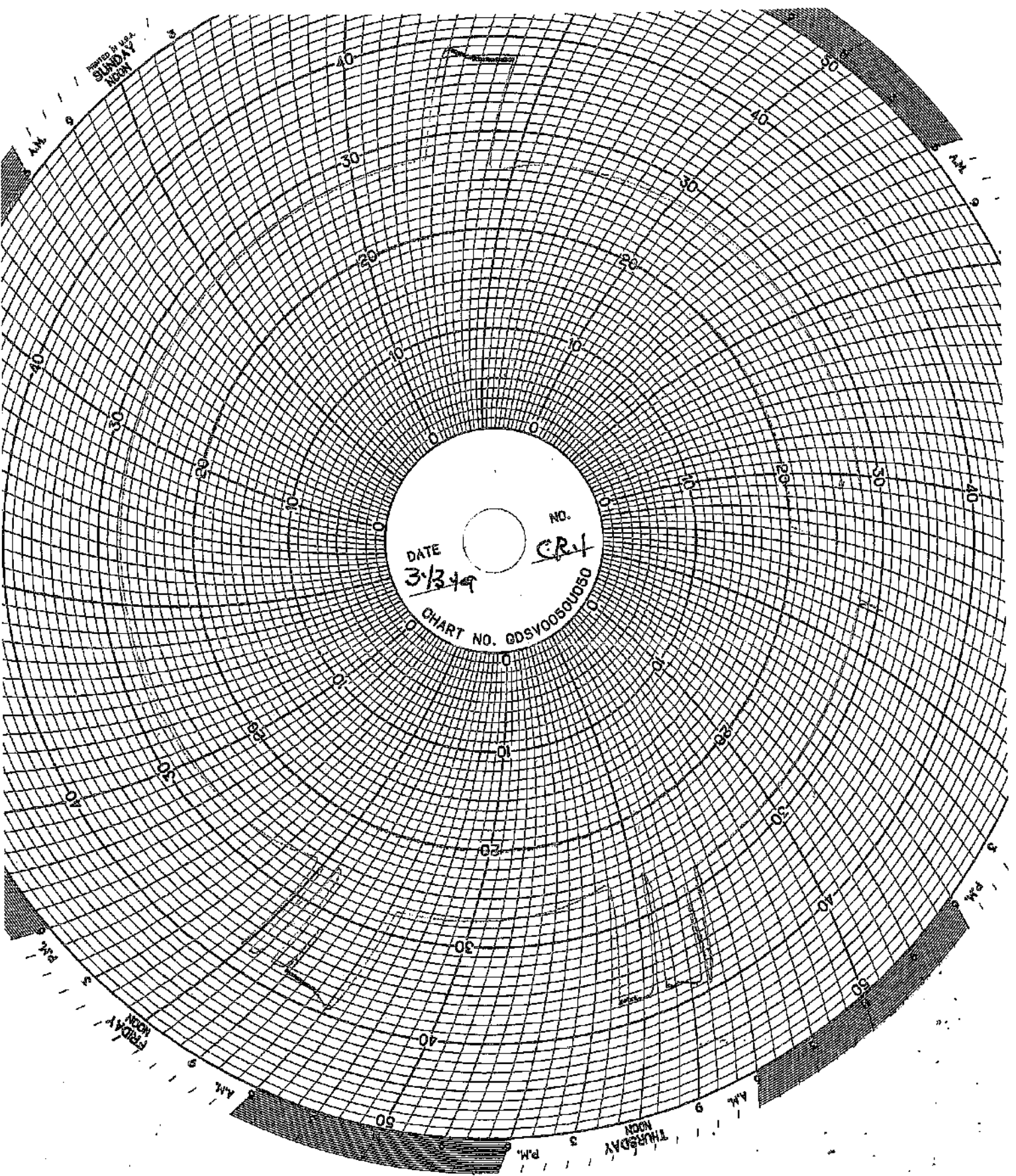
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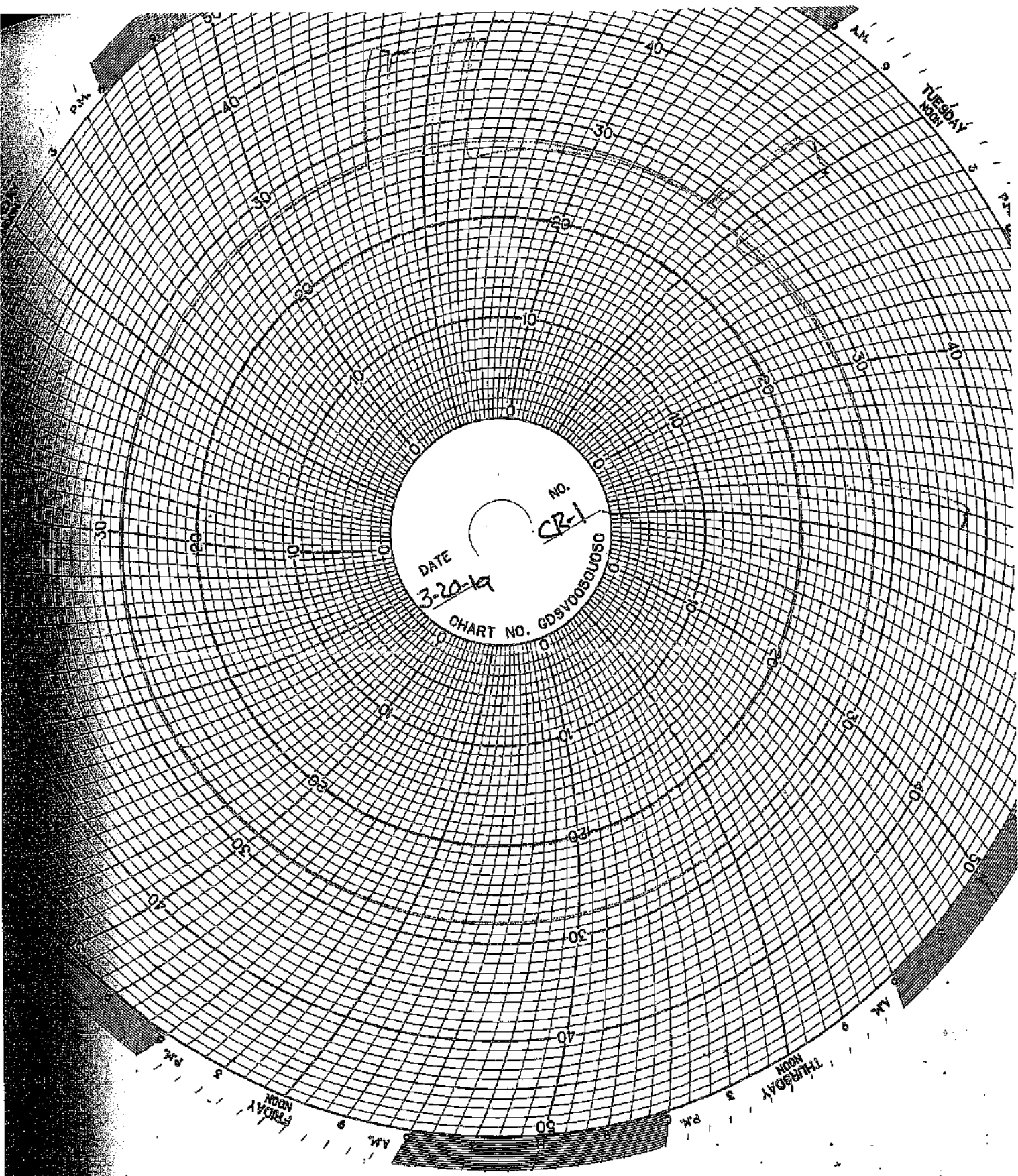
THURSDAY
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A.M.

Copyright © 1964
SUNDAY
HEAT

NO.
CR-1
DATE
3/13/49
CHART NO. QDSV0050U050





DATE
3-20-19

No.
CR-1

CHART NO. GDSV0050050

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WELL 2 DATA

Well 02 Monthly Data

Date	Min Injection Pressure (PSIG)	Max Injection Pressure (PSIG)	Min Sight Glass Level (in)	Max Sight Glass Level (in)	Min Annulus Pressure (PSIG)	Max Annulus Pressure (PSIG)	Min Injectate pH	Max Injectate pH	Min Flow Rate (GPM)	Max Flow Rate (GPM)	Min Differential Pressure (PSIG)	Max Differential Pressure (PSIG)
3/1/2019	0.0	0.0	-8.3	-8.3	96.3	98.7	8.2	8.2	0.0	0.0	96.3	98.7
3/2/2019	0.0	0.0	-8.3	-8.3	94.0	96.3	8.2	8.2	0.0	0.0	94.0	96.3
3/3/2019	0.0	0.0	-8.3	-8.3	91.6	94.0	8.2	8.2	0.0	0.0	91.6	94.0
3/4/2019	0.0	0.0	-8.3	-8.3	89.2	91.6	8.2	8.2	0.0	0.0	89.2	91.6
3/5/2019	0.0	0.0	-8.3	-8.3	86.9	89.2	8.2	8.2	0.0	0.0	86.9	89.2
3/6/2019	0.0	0.0	0.9	1.3	84.5	86.9	8.2	8.2	0.0	0.0	84.5	86.9
3/7/2019	0.0	0.0	1.3	1.6	82.2	84.5	8.2	8.2	0.0	0.0	82.2	84.5
3/8/2019	0.0	0.0	1.6	2.0	79.8	82.2	6.2	6.2	0.0	0.0	79.8	82.2
3/9/2019	0.0	0.0	2.0	2.3	77.4	79.8	6.2	6.2	0.0	0.0	77.4	79.8
3/10/2019	0.0	0.0	2.3	2.7	75.2	77.4	6.2	6.2	0.0	0.0	75.2	77.4
3/11/2019	0.0	0.0	2.7	3.0	72.8	75.2	6.2	6.2	0.0	0.0	72.8	75.2
3/12/2019	0.0	0.0	3.0	3.4	70.4	72.8	6.2	6.2	0.0	0.0	70.4	72.8
3/13/2019	0.0	0.0	3.4	3.7	68.1	70.4	6.2	6.2	0.0	0.0	68.1	70.4
3/14/2019	0.0	0.0	3.7	4.1	65.7	68.1	6.6	6.6	0.0	0.0	65.7	68.1
3/15/2019	0.0	0.0	4.1	4.4	63.3	65.7	6.6	6.6	0.0	0.0	63.3	65.7
3/16/2019	0.0	0.0	4.4	4.8	61.0	63.3	6.6	6.6	0.0	0.0	61.0	63.3
3/17/2019	0.0	0.0	4.8	5.1	58.6	61.0	6.6	6.6	0.0	0.0	58.6	61.0
3/18/2019	0.0	0.0	5.1	5.5	56.2	58.6	6.6	6.6	0.0	0.0	56.2	58.6
3/19/2019	0.0	0.0	5.5	5.8	53.9	56.2	6.6	6.6	0.0	0.0	53.9	56.2
3/20/2019	0.0	0.0	5.8	6.2	51.5	53.9	6.6	6.6	0.0	0.0	51.5	53.9
3/21/2019	0.0	0.0	6.2	6.5	49.1	51.5	6.6	6.6	0.0	0.0	49.1	51.5
3/22/2019	0.0	0.0	6.5	6.9	46.8	49.1	6.6	6.6	0.0	0.0	46.8	49.1
3/23/2019	0.0	0.0	6.9	7.2	44.4	46.8	6.6	6.6	0.0	0.0	44.4	46.8
3/24/2019	0.0	0.0	7.2	7.5	42.0	44.4	6.6	6.6	0.0	0.0	42.0	44.4
3/25/2019	0.0	0.0	7.5	7.9	39.7	42.0	6.4	6.4	0.0	0.0	39.7	42.0
3/26/2019	0.0	0.0	7.9	8.2	37.3	39.7	6.4	6.4	0.0	0.0	37.3	39.7
3/27/2019	0.0	0.0	8.2	8.6	34.9	37.3	6.4	6.4	0.0	0.0	34.9	37.3
3/28/2019	0.0	0.0	8.6	8.9	32.6	34.9	6.4	6.4	0.0	0.0	32.6	34.9
3/29/2019	0.0	0.0	8.9	9.3	30.2	32.6	6.4	6.4	0.0	0.0	30.2	32.6
3/30/2019	0.0	0.0	9.3	9.6	27.8	30.2	6.4	6.4	0.0	0.0	27.8	30.2
3/31/2019	0.0	0.0	9.6	10.0	25.5	27.8	6.4	6.4	0.0	0.0	25.5	27.8

Circle Chart Index

Environmental Geo-Technologies, LLC 28470 Citrin Drive Romulus, MI 48174

Chart Recorder #1

Channel #1

Blue Pen - Well 1 Injection Pressure (chart value x 30)

Channel #2

Red Pen - Well 1 Annulus Pressure (chart value x 30)

Channel #3

Green Pen - Well 1 Flow Rate (chart value x 4)

Channel #4

Black Pen - Well 1 Annulus Tank Level (chart value x 0)

Chart Recorder #2

Channel #1

Blue Pen - Well 2 Injection Pressure (chart value x 30)

Channel #2

Red Pen - Well 2 Annulus Pressure (chart value x 30)

Channel #3

Green Pen - Well 2 Flow Rate (chart value x 4)

Channel #4

Black Pen - Well 2 Annulus Tank Level (chart value x 0)

Chart Recorder #3

Channel #1

Blue Pen - Injection pH Well 1 & 2 (chart value + 3.3)

Channel #2

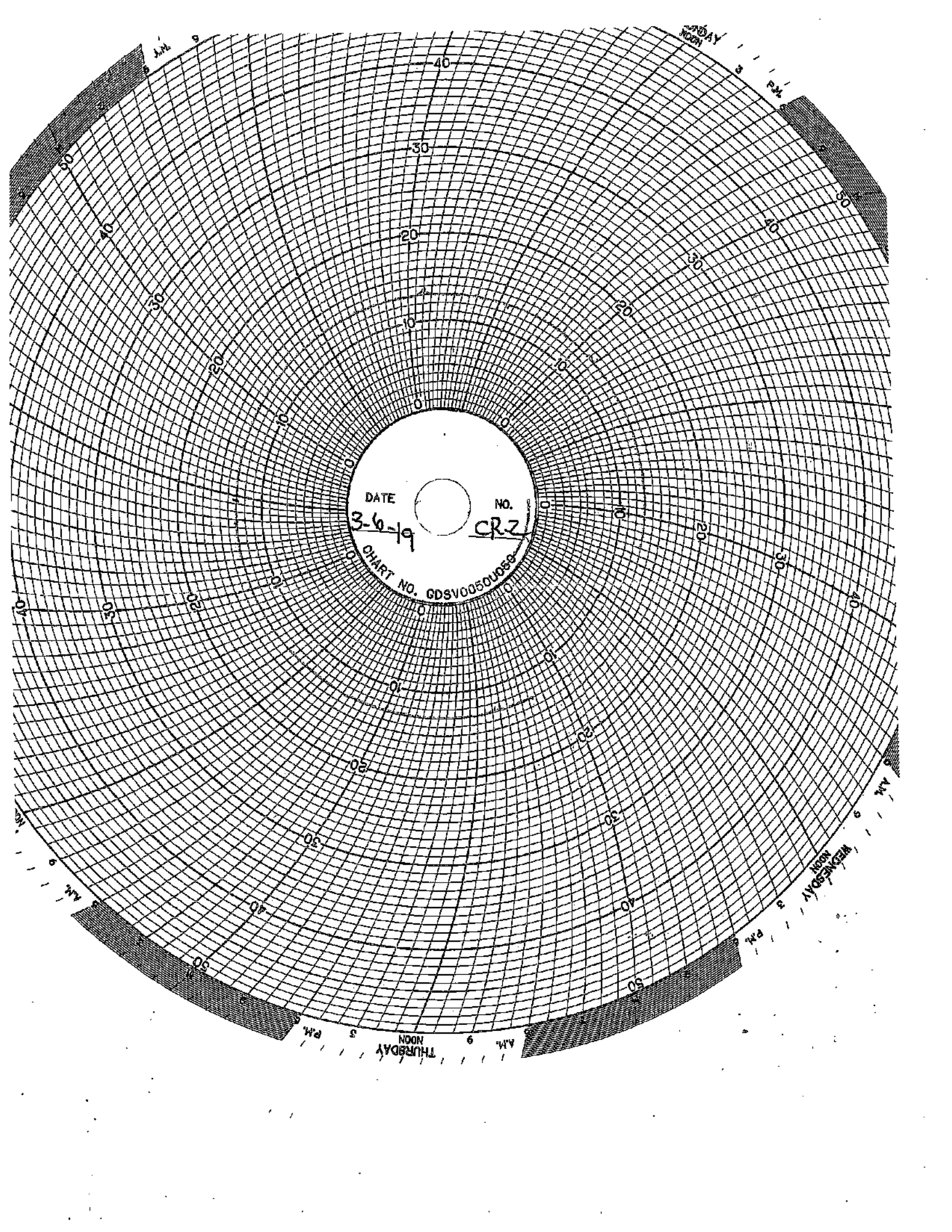
Red Pen - Well 1 Monthly Volume (chart value x 100,000)

Channel #3

Green Pen - Well 2 Monthly Volume (chart value x 100,000)

Channel #4

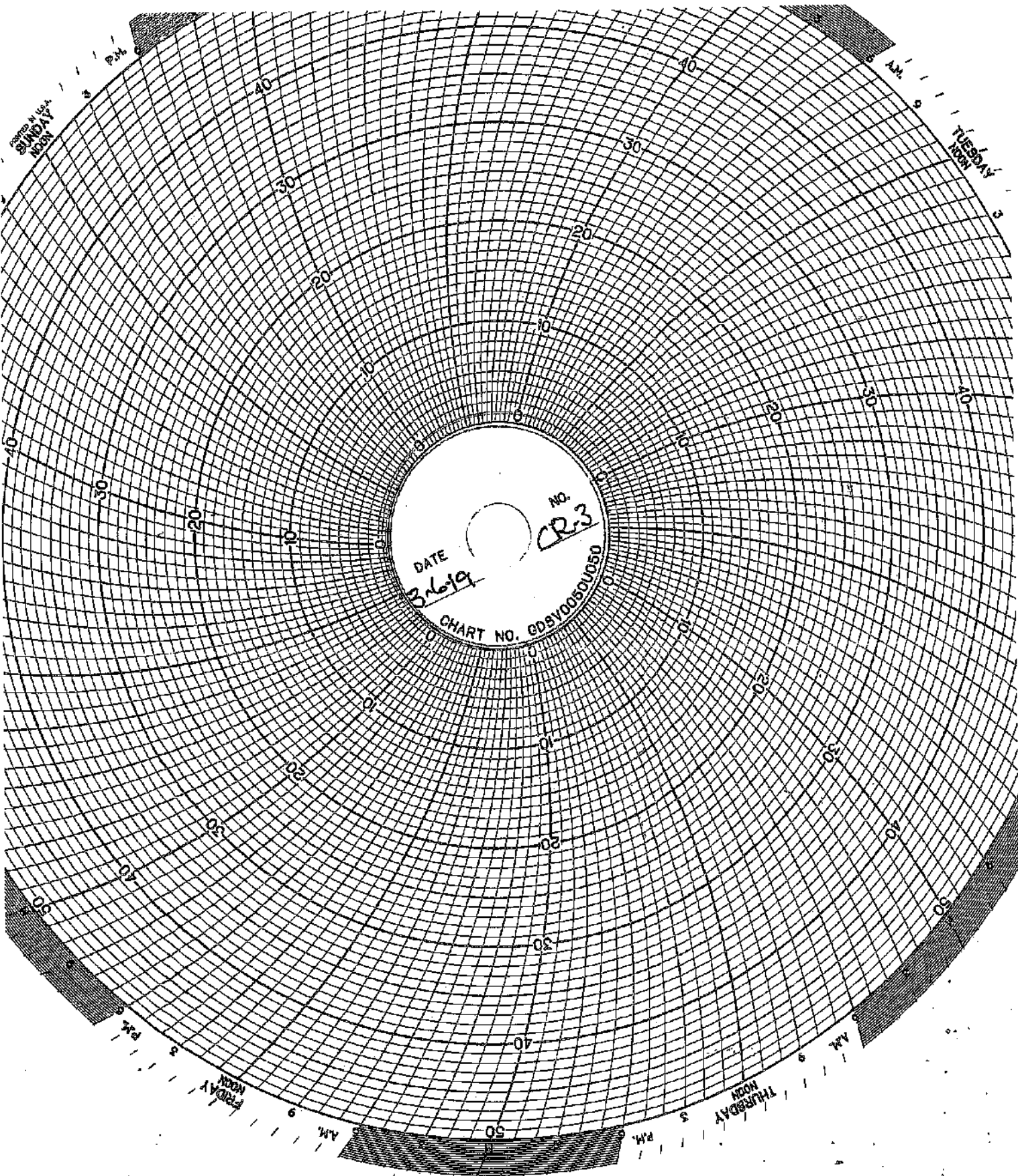
Black Pen - Temperature (chart value x 0)



DATE 3-6-19 NO. CR2
CHART NO. GDSV0050V058

WEDNESDAY 9 AM

THURSDAY 9 AM
THURSDAY NOON
THURSDAY 3 PM



STARTED AT 12:00
SUNDAY
NOON

TUESDAY
NOON

DATE
3/6/19

No.
CR3

CHART NO. GDSY00550050

9 AM

9 AM

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3-13-19

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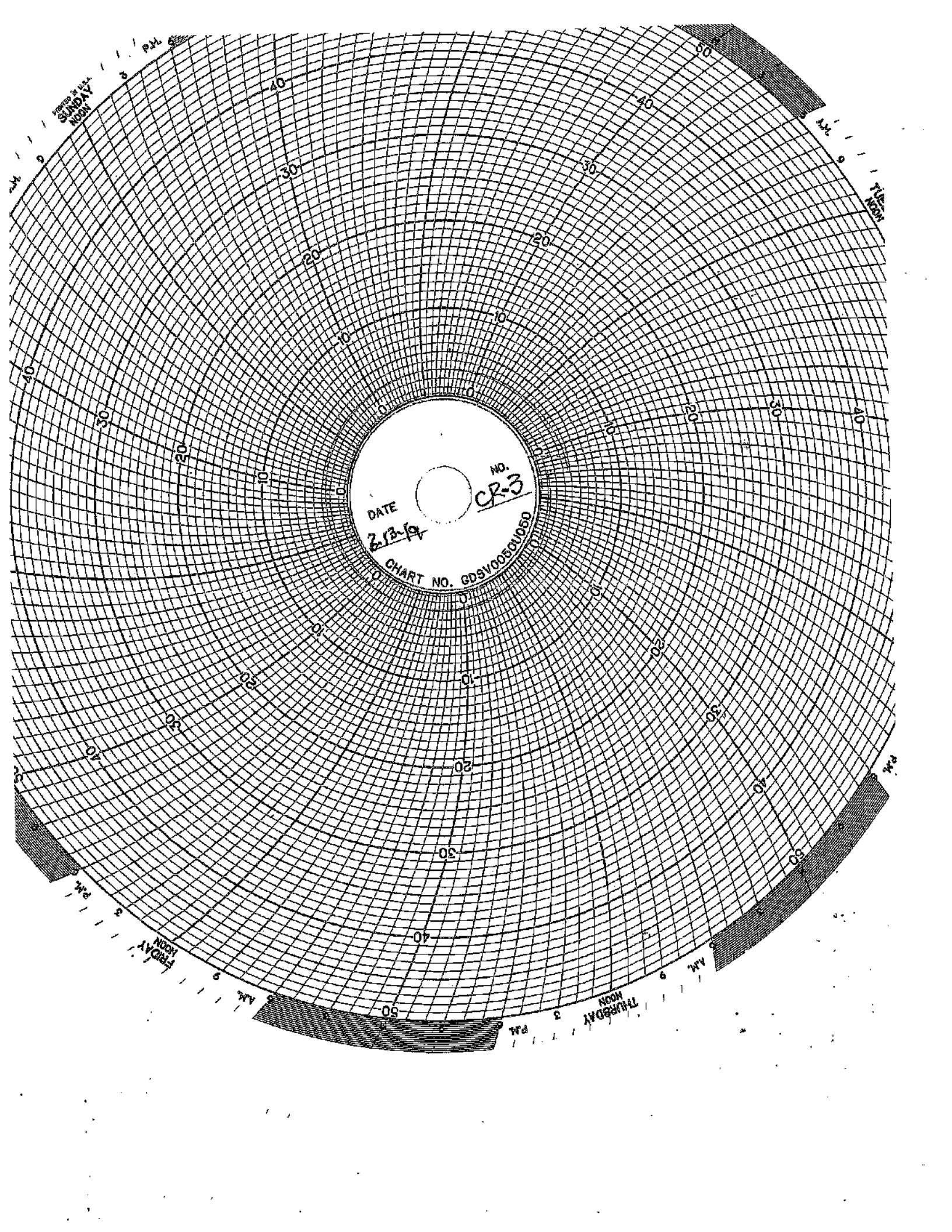
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THURSDAY
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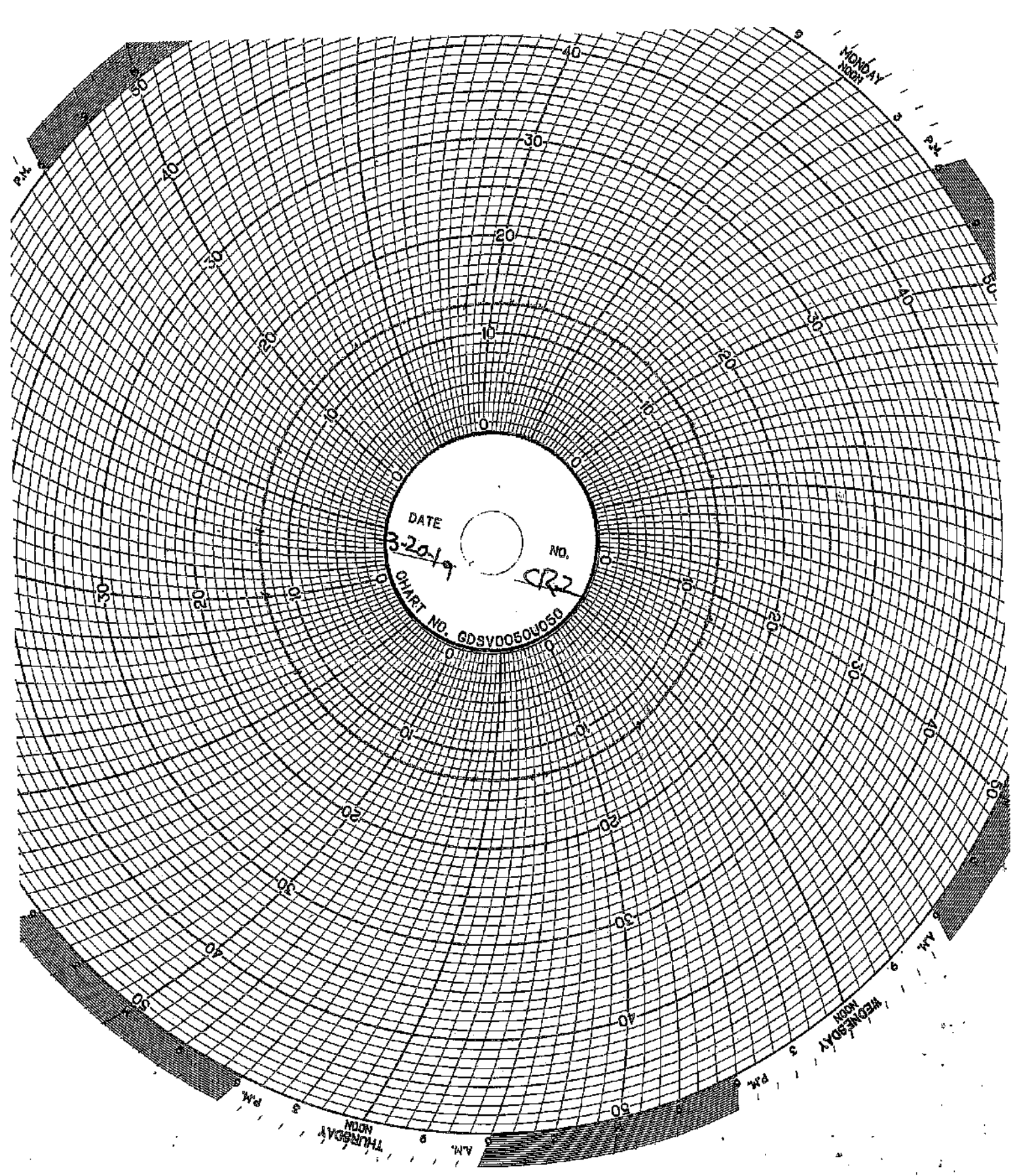
DATE 2-13-19
NO. CR-3
CHART NO. GDS100301050

Printed in U.S.A.
SUNDAY
NOON

THURSDAY
3 PM

FRIDAY
NOON

THURSDAY
3 PM



DATE 3-20-19
CHART NO. GDSV0050J050
NO. CR2

MONDAY
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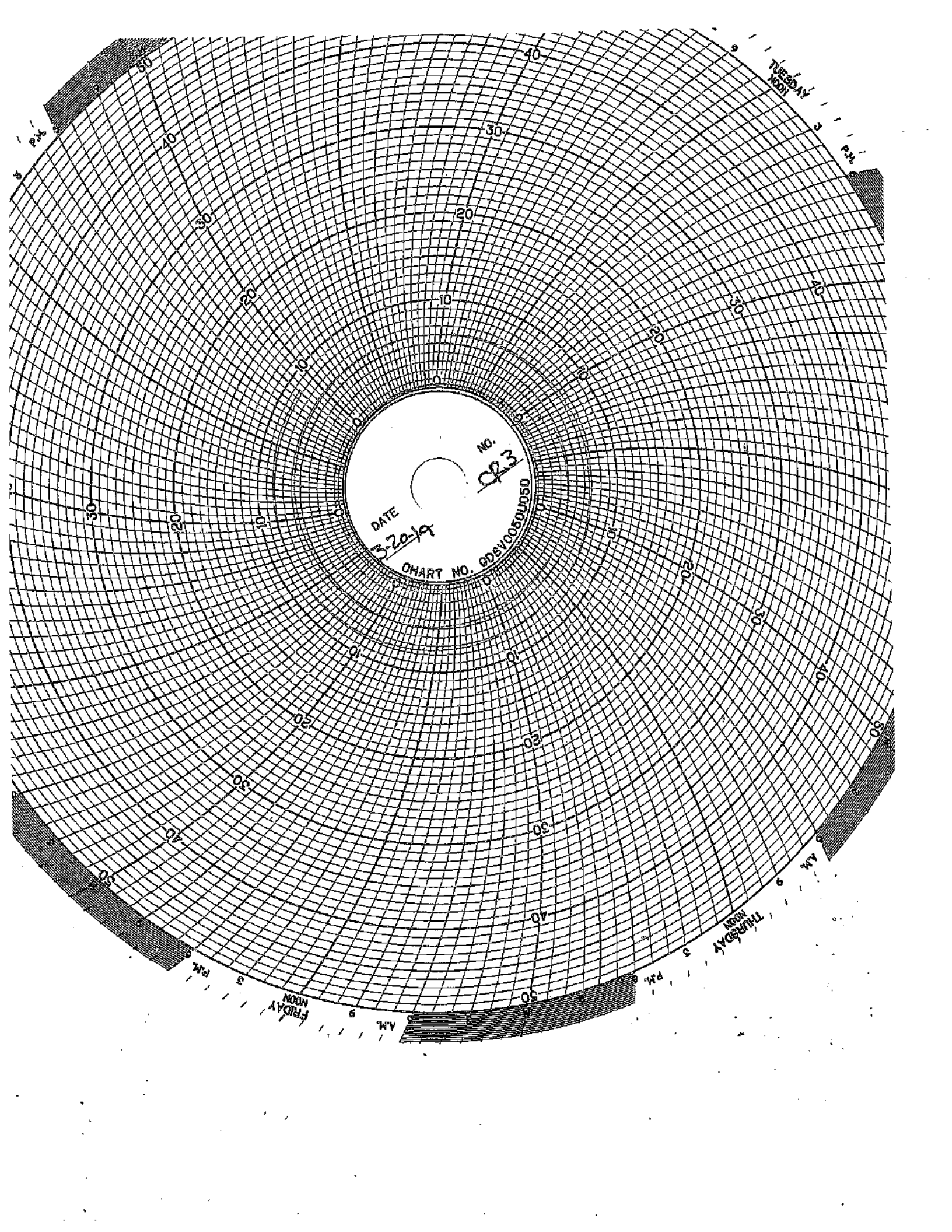
AM

WEDNESDAY
NOON

PM

THURSDAY
NOON

AM



DATE 3-20-19
CHART NO. 005V00501050
No. 023

TUESDAY 3 9 P.M.

THURSDAY 3 9 P.M.

FRIDAY 3 9 P.M.

THURSDAY 3 9 P.M.

MAINTENANCE LOG

UIC Monthly Maintenance Log

No Maintenance This Month

CORROSION MONITORING

CORROSION MONITORING COUPONS VISUAL DESCRIPTION

March, 2019

Fiberglass Coupon

The coupon is dark orange (rust) in color with similar semi-smooth textures on both sides. Its cut edges appear sanded. The coupon is free of pits, cracks, swelling, wicking and blemishes.

Hastelloy Coupon

This coupon is identified as C276 with Serial Number 5. The coupon is silver in color with a lightly sandblasted texture. It is clean and free of pits, cracks, and blemishes. There appears to be no effect on this coupon.

Stainless Steel Coupon

No change since last month.

CORROSION MONITORING COUPONS BASELINE VISUAL DESCRIPTION

November 4, 2013

Fiberglass

The fiberglass coupon is Red Box 2000 type and is 2-1/2 inches long by 1/2 inch wide and 1/4 inches thick. It is a dark orange (rust) in color with a glossy shine on one side a polished look on the opposite side and the cut edges look sanded.

Hastelloy

The hastelloy coupon is identified as C276 with serial number 1. The dimensions of the coupon are 3 inches long by 1/2 inch wide and 1/4 inch thick. The coupon is silver in color with a lightly sandblasted surface.

Stainless Steel

The stainless steel coupon is identified as 316L with serial number C1582. The dimensions of the coupon are 3 inches long by 1/2 inch wide and 1/4 inch thick. The coupon is silver in color with a lightly sandblasted surface.

**CORROSION MONITORING PLAN
COUPON SUMMARY**

Date	Hastelloy (C267)	Stainless Steel (316L)	Fiberglass (Redbox)	
12/19/2013	13.330 g	10.848 g	7.309 g	Initial Mass @ start up
2/21/2014	13.329 g	10.846 g	7.306 g	
3/10/2014	13.327 g	10.845 g	7.300 g	
4/18/2014	13.324 g	10.841 g	7.272 g	
5/30/2014	13.328 g	10.818 g	7.226 g	
6/30/2014	13.321 g	10.337 g	7.196 g	
7/11/2014	13.323 g	10.304 g	7.196 g	
8/12/2014	13.328 g	10.045 g	7.182 g	
9/17/2014	13.321 g	9.997 g	7.090 g	
10/30/2014	13.321 g	9.387 g	7.075 g	
11/21/2014	13.320 g	9.386 g	7.069 g	
12/19/2014	13.321 g	9.315 g	7.084 g	
1/12/2015	13.321 g	9.289 g	7.063 g	
2/23/2015	13.339 g	9.286 g	7.005 g	
3/31/2015	13.339 g	9.286 g	7.005 g	
4/27/2015	13.335 g	9.130 g	6.852 g	
5/21/2015	13.336 g	9.124 g	6.809 g	
6/12/2015	13.334 g	9.126 g	6.819 g	
7/27/2015	13.337 g	9.127 g	6.818 g	
8/26/2015	13.337 g	9.022 g	6.780 g	
9/21/2015	13.336 g	8.987 g	6.792 g	
10/19/2015	13.335 g	8.985 g	6.797 g	
11/16/2015	13.334 g	8.982 g	6.788 g	
12/17/2015	13.334 g	8.933 g	6.791 g	
1/29/2016	13.334 g	8.931 g	6.788 g	
2/16/2016	13.332 g	8.799 g	6.757 g	
3/31/2016	13.339 g	9.286 g	7.005 g	New stainless steel coupon
4/22/2016	13.333 g	8.590 g	6.744 g	
5/31/2015	13.334 g	6.084 g	6.784 g	
6/30/2016	13.328 g	10.942 g	6.793 g	
8/3/2016	13.326 g	10.529 g	6.743 g	
8/29/2016	13.325 g	10.020 g	6.723 g	
10/27/2016	13.325 g	8.765 g	6.708 g	
11/29/2016	13.327 g	8.571 g	6.740 g	
12/12/2016	13.323 g	8.223 g	6.717 g	
1/3/2017	13.325 g	8.059 g	6.712 g	
2/28/2017	13.324 g	7.634 g	6.727 g	
3/24/2017	13.325 g	7.370 g	6.732 g	
4/28/2017	13.325 g	6.736 g	6.736 g	
5/11/2017	13.323 g	7.352 g	6.689 g	
6/12/2017	13.323 g	7.357 g	6.689 g	
7/5/2017	13.323 g	7.355 g	6.689 g	New Fiberglass coupon
8/30/2017	13.324 g	7.353 g	18.105 g	
9/28/2017	13.325 g	7.352 g	18.060 g	
10/11/2017	13.324 g	7.350 g	18.038 g	
11/16/2017	13.325 g	7.363 g	18.047 g	
12/12/2017	13.326 g	7.308 g	18.307 g	

**CORROSION MONITORING PLAN
COUPON SUMMARY**

Date	Hastelloy	Stainless Steel	Fiberglass	
1/29/2018	13.326 g	10.930 g	18.027 g	New stainless steel coupon
2/9/2018	13.325 g	10.932 g	18.044 g	
3/19/2018	13.325 g	10.926 g	18.030 g	
4/16/2018	13.336 g	10.863 g	18.068 g	
5/17/2018	13.325 g	10.858 g	18.037 g	
6/20/2018	13.325 g	10.855 g	18.029 g	
7/12/2018	13.326 g	10.852 g	18.032 g	
8/21/2018	13.326 g	10.854 g	18.031 g	
9/14/2018	13.326 g	10.852 g	18.036 g	
10/10/2018	13.326 g	10.851 g	18.031 g	
11/20/2018	13.326 g	10.853 g	18.032 g	
12/11/2018	13.326 g	10.852 g	18.033 g	
1/14/2019	13.326 g	10.852 g	18.033 g	
2/20/2019	13.326 g	10.850 g	18.033 g	
3/15/2019	13.326 g	10.850 g	18.033 g	

GHSQUIERE PLASTIC TESTING, INC.

80450 HARPER AVENUE
HARPER WOODS, MI 48225
PHONE (313) 885-6585
FAX (313) 885-1771

Report Date: November 15, 2013
Test Date: October 15 - November 14, 2013

Report #1310-77651
Performed for:
Environmental Geo-Technologies
28470 Citrin Drive
Romulus, MI 48174

Attention: Mr. Don Anderson

WORK REQUESTED:

Perform Barcol Hardness test on sample submitted.

DESCRIPTION OF SAMPLE:

Sample submitted was identified as a fiberglass test coupon.

(P. O. #Credit Card).

WORK PERFORMED:

Test specimen was prepared as necessary and conditioned for a minimum of 24 hours at standard laboratory conditions prior to testing.

Barcol Hardness test was performed in accordance with the procedures of ASTM D2583-13. One specimen was tested.

RESULTS:

The following determination was made based upon the above test:

BARCOL HARDNESS

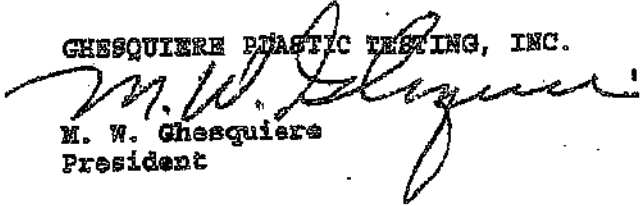
Hardness

Specimen 1

90

Specimen is being returned with this report for further evaluation.

GHSQUIERE PLASTIC TESTING, INC.


M. W. Ghesquiere
President

MWG/kni

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TOTAL 1 PAGES

Ghesquiere Plastic Testing, Inc.

20450 HARPER AVENUE
HARPER WOODS, MI 48226
PHONE (813) 885-3536
FAX (818) 885-1771

Report Date: February 17, 2014
Test Date: February 14 - 17, 2014

Report #1402-78036
Performed for:
Environmental Geo-Technologies
28470 Citrin Drive
Romulus, MI 48174

Attention: Mr. Don Anderson

WORK REQUESTED:

Perform Barcol Hardness test on sample submitted.

DESCRIPTION OF SAMPLE:

Sample submitted was identified as a fiberglass test coupon.

(P. O. #Credit Card).

WORK PERFORMED:

Test specimen was prepared as necessary and conditioned for a minimum of 24 hours at standard laboratory conditions prior to testing.

Barcol Hardness test was performed in accordance with the procedures of ASTM D2583-13. One specimen was tested.

RESULTS:

The following determination was made based upon the above test:

BARCOL HARDNESS

Hardness

Specimen ID: 90

Specimen was returned to the client on February 17, 2014.

Ghesquiere Plastic Testing, Inc.


M. W. Ghesquiere
President

MWG/dm

TOTAL 1 PAGES

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Ghesquiere Plastic Testing, Inc.

20450 HARPER AVENUE
HARPER WOODS, MI 48225
PHONE (313) 885-3535
FAX (313) 885-1771

Report Date: June 16, 2014
Test Date: June 13 - 16, 2014

Report #1406-78499
Performed for:
Environmental Geo-Technologies, LLC
28470 Citrin Drive
Romulus, MI 48174

Attention: Mr. Don Anderson

WORK REQUESTED:

Perform Barcol Hardness test on sample submitted.

DESCRIPTION OF SAMPLE:

Sample submitted was identified as a fiberglass test coupon.

(P. O. #Credit Card).

WORK PERFORMED:

Test specimen was prepared as necessary and conditioned for a minimum of 24 hours at standard laboratory conditions prior to testing.

Barcol Hardness test was performed in accordance with the procedures of ASTM D2583-13. One specimen was tested.

RESULTS:

The following determination was made based upon the above test:

BARCOL HARDNESS

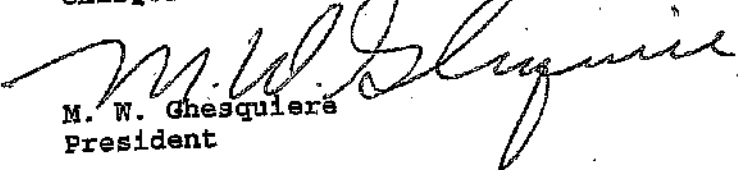
Hardness

Specimen 1

85

Specimen was returned to the client June 16, 2014.

Ghesquiere Plastic Testing, Inc.


M. W. Ghesquiere
President

MWG/dm



October 2, 2014

- TEST REPORT -

PN 118325
PO Attn: John Frost

PLASTICS TESTING DEPARTMENT

Prepared For:

John Frost
Environmental Geo-Technologies, LLC
28470 Citrin Drive
Romulus, MI 48174

Prepared By:

Melissa Martin
Sr. Project Technician

Approved By:

Jim Drummond
Physical & Plastics Testing, Manager



An AZLA ISO 17025 Accredited Testing Laboratory — Certificate Numbers 253.01 & 253.02
ISO 9001:2008 Registered

ISO 9001:2008
Registered

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www.ardl.com

2887 Gilchrist Rd. | Akron, Ohio 44305 | answers@ardl.com
Toll Free: (800) 830-ARDL | Worldwide: (330) 794-6600 | Fax: (330) 794-6610



Testing. Development. Problem Solving.

October 2, 2014

John Frost
Environmental Geo-Technologies, LLC

Page 2 of 2
PN118325

SUBJECT: Barcol Hardness on one material.
PO# Attn: John Frost

RECEIVED: One small section identified as: Fiberglass Coupon.

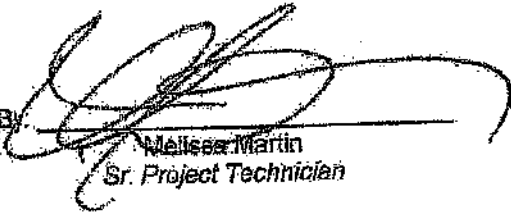
BARCOL HARDNESS ASTM D 2583-13a

Results

Barcol Hardness, Instant

97

Prepared By:


Melissa Martin
Sr. Project Technician

Approved By:


Scott W. Yates
Plastics Testing Assistant Manager

www.ardl.com

2887 Gilchrist Rd. | Akron, Ohio 44305 | answers@ardl.com
Toll Free (800) 830-ARDL | Worldwide (330) 784-6600 | Fax (330) 784-6610



Progress Through Innovation, Technology and Customer Satisfaction

October 22, 2015

• TEST REPORT •

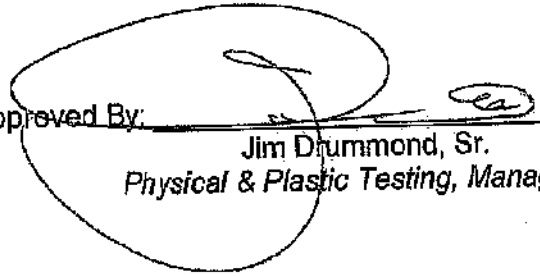
PN 125322
PO 00154

PLASTICS TESTING DEPARTMENT

Prepared For:

John Frost
Environmental Geo-Technologies, LLC
28470 Citrin Drive
Romulus, MI 48174

Prepared By: 
Melissa Martin
Sr. Project Technician

Approved By: 
Jim Drummond, Sr.
Physical & Plastic Testing, Manager



An A2LA ISO 17025 Accredited Testing Laboratory — Certificate Numbers 255.01 & 255.02
ISO 9001:2008 Registered



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Fax (330) 794-6610 | Worldwide (330) 794-6600



October 22, 2015

John Frost
Environmental Geo-Technologies, LLC

Page 2 of 2
PN 125322

SUBJECT: Barcol Hardness on one material.

RECEIVED: One small section identified as; Fiberglass Coupon.

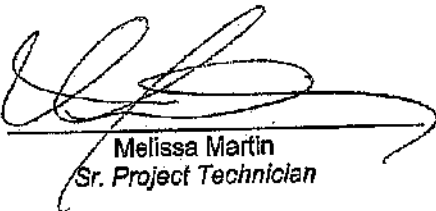
BARCOL HARDNESS ASTM D 2583-13a
Instant Reading

Results

Barcol Hardness, Instant

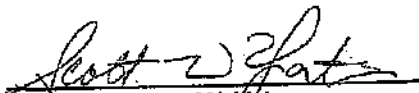
96

Prepared By:


Melissa Martin
Sr. Project Technician

to

Approved By:


Scott W. Yates
Plastics Testing Assistant Manager



Progress Through Innovation, Technology and Customer Satisfaction

December 12, 2016


TEST REPORT

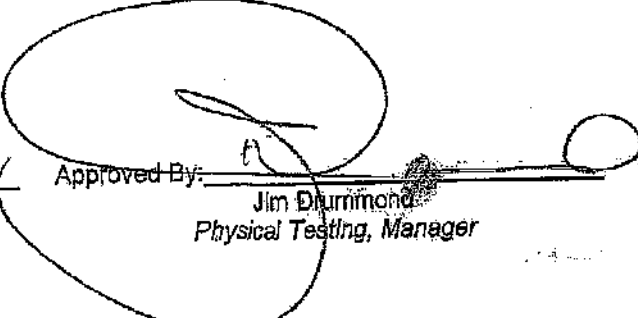
PN 132662
PO

PLASTICS TESTING DEPARTMENT

Prepared For:

John Frost
Environmental Geo-Technologies, LLC
28470 Citrin Drive
Romulus, MI 48174

Prepared By: 
Melissa Martin
Senior Project Technician

Approved By: 
Jim Diurnich
Physical Testing, Manager

Rev 041916



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December 12, 2016

John Frost
Environmental Geo-Technologies, LLC

Page 2 of 2
PN 132662

SUBJECT: Barcol Hardness on one (1) material.


RECEIVED: One (1) small section identified as; Fiberglass Coupon.

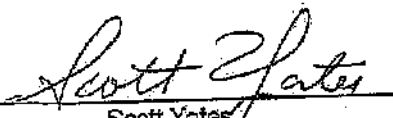
BARCOL HARDNESS ASTM D 2583-13a
Instant Reading

RESULTS

Barcol Hardness, Instant

96

Prepared By: 
Melissa Martin
Senior Project Technician

Approved By: 
Scott Yates
Plastics Testing, Assistant Manager

wk

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Progress Through Innovation, Technology and Customer Satisfaction

December 13, 2017

TEST REPORT


PN 139140
PO#

PLASTIC TESTING DEPARTMENT

Prepared For:

John Frost
Environmental Geo-Technologies, LLC
28470 Citrin Drive
Romulus, MI 48174

Prepared By: 
Melissa Martin
Sr Project Technician

Approved By: 
Jim Drummond
Rubber & Plastic Testing, Manager

Rev 041916



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December 13, 2017

John Frost
Environmental Geo-Technologies, LLC

Page 2 of 2
PN 139140

SUBJECT: Barcol Hardness on one material.


RECEIVED: One small section identified as; Fiberglass Coupon.

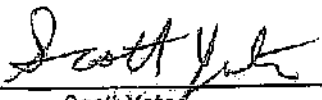
BARCOL HARDNESS ASTM D 2583-13a
Instant Reading

Results

Barcol Hardness, Instant

96

Prepared By: 
Melissa Martin
Sr Project Technician

Approved By: 
Scott Yates
Plastics Testing, Assistant Manager

sc

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**INJECTION
FINGERPRINTS**

FINGERPRINT FORM

ENVIRONMENTAL GEO-TECHNOLOGIES, LLC.

RECEIVING & APPROVAL FORM

Date	3-8-19
Receiving ID#	I03081901
Manifest# Line:	
Land Ban Cert Included	Yes No
EGT Approval #	
Generator	
Client	
Transporter	
Time In	
Time out	
Received by	<i>[Signature]</i>
Sampled by	<i>[Signature]</i>

Compatible? (RT#)	Yes	No	Barium	
PCBs (ppm)(Oily Waste Only)?			Calcium	
TOC (ppm)(CC Waste Only)?			Total Iron	
Flash Point (°F)	>140°F		Magnesium	
pH (S.U.)	6.2		Sodium Chloride	
Cyanides? (mg/L)			Bicarbonate	
Sulfides? (ppm)			Carbonate	
Specific Gravity	1.02		TDS	12%
Physical Description			Resistivity	
Stream Consistency	Yes	No	Sulfate	
Oil in Sample	Yes	No		
Temperature	68°F			
Conductivity	88mS			
% Solids	12%			
Turbidity	Yes	No		
Color (visual)				
TSS (%)	50%			
Radiation Screen (as needed)				
Lab Signature	<i>[Signature]</i>			

FINGERPRINT FORM

ENVIRONMENTAL GEO-TECHNOLOGIES, LLC.

RECEIVING & APPROVAL FORM

RECEIVING INFORMATION	
Date	3-14-19
Receiving ID#	J03141901
Manifest# Line:	
Land Ban Cert included	Yes No
EGT Approval #	
Generator	
Client	
Transporter	
Time In	
Time out	
Received by	<i>[Signature]</i>
Sampled by	<i>[Signature]</i>

ANALYSIS INFORMATION			
Compatible? (RT#)	Yes	No	Barium
PCBs (ppm)(Oily Waste Only)?			Calcium
TOC (ppm)(CC Waste Only)?			Total Iron
Flash Point (°F)	>140°F		Magnesium
pH (S.U.)	6.6		Sodium Chloride
Cyanides? (mg/L)			Bicarbonate
Sulfides? (ppm)			Carbonate
Specific Gravity	1.02		TDS
Physical Description			Resistivity
Stream Consistency	Yes	No	Sulfate
Oil In Sample	Yes	No	
Temperature	70°F		
Conductivity	105 MS		
% Solids	6%		
Turbidity	Yes	No	
Color (visual)			
TSS (%)	<0.1		
Radiation Screen (as needed)			
Lab Signature	<i>[Signature]</i>		

FINGERPRINT FORM

ENVIRONMENTAL GEO-TECHNOLOGIES, LLC.

RECEIVING & APPROVAL FORM

Date	3-25-19
Receiving ID#	103251901
Manifest# Line:	
Land Ban Cert included	Yes No
EGT Approval #	
Generator	
Client	
Transporter	
Time In	
Time out	
Received by	JKF
Sampled by	

Compatible? (RT#)	Yes No	Barium	
PCBs (ppm)(Oily Waste Only)?		Calcium	
TOC (ppm)(CC Waste Only)?		Total Iron	
Flash Point (°F)	>140°F	Magnesium	
pH (S.U.)	6.9	Sodium Chloride	
Cyanides? (mg/L)		Bicarbonate	
Sulfides? (ppm)		Carbonate	
Specific Gravity	1.02	TDS	4%
Physical Description		Resistivity	
Stream Consistency	Yes No	Sulfate	
Oil in Sample	Yes No		
Temperature	67°F		
Conductivity	105 mS		
% Solids	4%		
Turbidity	Yes No		
Color (visual)			
TSS (%)	20.1		
Radiation Screen (as needed)			
Lab Signature			

**WASTE STREAMS
CHARACTERIZATIONS**

ENVIRONMENTAL GEO-TECHNOLOGIES, LLC
 28470 Cliff Dr, Romulus, MI 48174. Telephone 734 946 1000. Fax 734 946 1002

Generator Waste Profile
Profile 01402

GENERATOR INFORMATION

Name: [REDACTED] USEPA ID # [REDACTED]
 Facility Address: [REDACTED] SIC/NAICS Code: [REDACTED] State Code: [REDACTED]
 City: [REDACTED] State: [REDACTED] Zip Code: [REDACTED]
 Contact: [REDACTED] Title: [REDACTED] Phone: () [REDACTED] Fax: () [REDACTED]

BILLING INFORMATION

SAME AS ABOVE
 Company Name: [REDACTED]
 Address: [REDACTED]
 City: [REDACTED] State: [REDACTED] Zip Code: [REDACTED]
 Attention: [REDACTED] Phone: [REDACTED] Fax: [REDACTED]

WASTE INFORMATION

Name of Waste/Common Chemical Name:

Wastewater
 Process Generating Waste (Please be specific, incomplete information may delay the approval process):
Process wastewater from chemical manufacture of Quaternary Ammonium Salts

USEPA / STATE WASTE IDENTIFICATION

- This waste is considered to be: Non Hazardous Liquid Industrial Waste Hazardous Waste
- Regulated by TSCA? Yes No (PGBs, etc.)
- List ALL Applicable Waste Codes: Q291

PHYSICAL CHARACTERISTICS OF WASTE

Color: <input type="checkbox"/> White/Clear <input checked="" type="checkbox"/> Black/Brown <input checked="" type="checkbox"/> Other [REDACTED]	Suspended Solids <input type="checkbox"/> 0-1% <input type="checkbox"/> 2-5% <input checked="" type="checkbox"/> 1-3% <input type="checkbox"/> > 5%	Layers: <input type="checkbox"/> Multi-Layered <input type="checkbox"/> Bi-Layered <input checked="" type="checkbox"/> Single Phase	Specific Gravity: <input type="checkbox"/> < 0.8 <input checked="" type="checkbox"/> 1.0 - 1.2 <input type="checkbox"/> 0.8 - 1.0 <input type="checkbox"/> 1.3 - 1.4 Exact / Other	<i>acceptable</i> <i>031519</i>
-----------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------

pH: NA ≤ 2 2-4 4-6 6-8 8-10 10-12.5 ≥ 12.5

Liquid Flash Point: < 73°F 73 - 100°F 101 - 140°F 141 - 200°F > 200°F None Closed Cup Open Cup

VOC CONCENTRATION: ≤ 1 PPM (MUST BE COMPLETED)

TOTAL COMPOSITION OF WASTE * MUST BE EQUAL TO OR GREATER THAN 100% (LIST EACH CONSTITUENT >= 0.1%) *See Attached*

CONSTITUENT	MAX	MIN	CONSTITUENT	MAX	MIN
<u>Water</u>	<u>95</u>	<u>90</u>			
<u>Trace organics</u>	<u>5</u>	<u>0</u>			
<u>Solids</u>	<u>5</u>	<u>0</u>			

Waste water

FIGURE 4-3.

CAMUS WATER 1337 Evanston Avenue Muskegon, MI 49442 ph 231.788.4934 ; fax 231.788.6474		GENERATOR'S WASTE MATERIAL PROFILE SHEET							
		NEW	AMENDMENT						
GENERATOR		PROFILE NUMBER							
Name	[REDACTED]	Name	[REDACTED]						
Address	[REDACTED]	Address	[REDACTED]						
Contact Name	[REDACTED]	Contact	[REDACTED]						
Contact Phone	[REDACTED]	Email	[REDACTED]						
Email	[REDACTED]	TRANSPORTER							
EPA ID #	[REDACTED]	Name	[REDACTED]						
SIC Code	[REDACTED]	Address	[REDACTED]						
Volume	[REDACTED]	Contact	[REDACTED]						
Shipping Method	[REDACTED]	Email	[REDACTED]						
Comments	[REDACTED]	EPA ID#	[REDACTED]						
WASTE DESCRIPTION									
Applicable Manufacturing Category (if any):									
Common Name of Process Generating Waste: <u>Waste water</u>									
DOT Shipping Name: <u>NON-HAZARDOUS</u>									
Is this waste classified as hazardous under RCRA? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>									
If yes, specify:									
Is the process by which this waste is generated subject to Federal Categorical Pretreatment Standards? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>									
If yes, specify:									
Description of Waste	<input checked="" type="checkbox"/> Wastewater from Organic Chemical Product Operations <input type="checkbox"/> Wastewater from Adhesives and/or Epoxies Formulation <input type="checkbox"/> Tank Clean-out from Organic, non-Petroleum Sources <input type="checkbox"/> Contaminated Groundwater Clean-up from Non-petroleum Sources <input type="checkbox"/> Landfill Leachate	<input type="checkbox"/> Still Bottoms <input type="checkbox"/> Spilled Waste <input type="checkbox"/> Washwater from Pallet Washes <input type="checkbox"/> Spill Remediation Wastes <input type="checkbox"/> Off-Specification Organic product							
CHEMICAL & PHYSICAL STATE									
<input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Semi-liquid <input type="checkbox"/> Solid	<input type="checkbox"/> Monophased <input type="checkbox"/> Biphased <input type="checkbox"/> Single Phase	Flashpoint (°F)	<table border="1"> <thead> <tr> <th>Minimum</th> <th>Typical</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>7200</td> <td></td> <td></td> </tr> </tbody> </table>	Minimum	Typical	Maximum	7200		
Minimum	Typical	Maximum							
7200									
List key constituents in waste:		pH (s.u.)							
[REDACTED]		Specific Gravity							
[REDACTED]		Viscosity							
[REDACTED]		Percent Solids	<table border="1"> <thead> <tr> <th>Minimum</th> <th>Typical</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>5</td> <td>5</td> </tr> </tbody> </table>	Minimum	Typical	Maximum	4	5	5
Minimum	Typical	Maximum							
4	5	5							
MSDS Attached?	Yes <input checked="" type="checkbox"/>	Comment:							
TCLP Attached?	Yes <input checked="" type="checkbox"/>	Comment:							
SAMPLE INFORMATION (REQUIRED)									
Date Collected:	<u>6-25</u>	Time Collected:							
Sampled by:	[REDACTED]	Sampling Location:	<u>Waste Water</u>						
Sample Type:	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite								

FIGURE 4-3.

<p style="text-align: center;">CAMUS WATER <small>WASTEWATER TREATMENT</small></p> <p style="text-align: center;">5307 Evanson Avenue Muskegon, MI 49441 Ph: 231.788-4874 Fax: 231.788-5473</p>	<p>GENERATOR'S WASTE MATERIAL PROFILE SHEET</p>																																																
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">NEW</td> <td style="width: 30%;">AMENDMENT</td> <td style="width: 40%;">PROFILE NUMBER</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NEW	AMENDMENT	PROFILE NUMBER																																													
NEW	AMENDMENT	PROFILE NUMBER																																															
<p>CHARACTERISTICS</p> <table style="width: 100%;"> <tr> <td style="width: 30%;">COD (ppm)</td> <td style="width: 30%;"></td> <td style="width: 30%;">Cyanide (ppm)</td> <td style="width: 10%;"></td> </tr> <tr> <td>BOD (ppm)</td> <td></td> <td>Arsenic (ppm)</td> <td></td> </tr> <tr> <td>TDC (ppm)</td> <td></td> <td>Lead (ppm)</td> <td></td> </tr> <tr> <td>TKN (ppm)</td> <td></td> <td>Mercury (ppm)</td> <td></td> </tr> <tr> <td>NH₃-N (ppm)</td> <td></td> <td>Silver (ppm)</td> <td></td> </tr> <tr> <td>PO₄-P (ppm)</td> <td></td> <td>Zinc (ppm)</td> <td></td> </tr> <tr> <td>TSS (ppm)</td> <td></td> <td>Conductivity</td> <td></td> </tr> <tr> <td>Oil & Grease (ppm)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cadmium (ppm)</td> <td></td> <td>VOCs by EPA 824</td> <td>Yes <input type="checkbox"/> No <input type="checkbox"/></td> </tr> <tr> <td>Chromium (ppm)</td> <td></td> <td>SVOCs by EPA 825</td> <td>Yes <input type="checkbox"/> No <input type="checkbox"/></td> </tr> <tr> <td>Copper (ppm)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Nickel (ppm)</td> <td></td> <td></td> <td></td> </tr> </table>		COD (ppm)		Cyanide (ppm)		BOD (ppm)		Arsenic (ppm)		TDC (ppm)		Lead (ppm)		TKN (ppm)		Mercury (ppm)		NH ₃ -N (ppm)		Silver (ppm)		PO ₄ -P (ppm)		Zinc (ppm)		TSS (ppm)		Conductivity		Oil & Grease (ppm)				Cadmium (ppm)		VOCs by EPA 824	Yes <input type="checkbox"/> No <input type="checkbox"/>	Chromium (ppm)		SVOCs by EPA 825	Yes <input type="checkbox"/> No <input type="checkbox"/>	Copper (ppm)				Nickel (ppm)			
COD (ppm)		Cyanide (ppm)																																															
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Copper (ppm)																																																	
Nickel (ppm)																																																	
<p>PESTICIDE/HERBICIDE WARRANTY</p> <p>I hereby certify the following: The waste identified in this waste profile form does not contain Endrin, Dieldrin, DDT, DDE, DDD, DDDT, Toxaphene, 2,4,5-TP (Silvex), Chlordane, or Heptachlor (and its Epoxide). These constituents are not used at the location where this waste was generated, nor are they known to be present in the materials of which the above waste is composed. I hereby agree to indemnify and hold harmless the receiving facility from any cost, damages, or liability resulting from the breach of this warranty.</p> <p style="text-align: right;">Generator's Signature: </p>																																																	
<p>PCB/CONTAMINATED BIOPHENYL (CB) WARRANTY</p> <p>I hereby certify the following: The waste identified in this waste profile form does not contain PCBs at a concentration of 40 ppm when measured in each container or vessel. The waste is not contaminated with PCBs in excess of 40 ppm. I hereby agree to indemnify and hold harmless the receiving facility from any cost, damages, or liability resulting from the breach of this warranty.</p> <p style="text-align: right;">Generator's Signature: </p>																																																	
<p>HAZARDOUS WASTE WARRANTY</p> <p>I hereby certify the following: The waste identified in this waste profile form does not contain any material at a concentration which would render it hazardous as defined in 40 CFR 261.3 when measured in each container or vessel. I hereby agree to indemnify and hold harmless the receiving facility from any cost, damages, or liability resulting from the breach of this warranty.</p> <p style="text-align: right;">Generator's Signature: </p>																																																	
<p>GENERATOR CERTIFICATION OF WASTE PROFILE</p> <p>Name (Print): Title: </p> <p>Signature: Date: <u>6/10/83</u></p>																																																	
<p>WWTP ACCEPTANCE OF WASTE FOR TREATMENT</p> <p>Name (Print): _____ Title: _____</p> <p>Signature: _____ Date: _____</p>																																																	
<p>CAMUS ACCEPTANCE OF WASTE</p> <p>Name (Print): _____ Title: _____</p> <p>Signature: _____ Date: _____</p>																																																	



General Waste Profile

Approval # 12312560000

Generator Information

Generator Name: [Redacted]
Facility Address: [Redacted]
Contact Name: [Redacted]
Generator EPA ID#: [Redacted]

Customer Information

Customer Name: AME
Billing Address: [Redacted]
Contact Name: [Redacted]

Waste Information

Waste Name: Waste

Process Generating Waste: Chemical Manufacture

Volume: ~ 20,000 gal
MSDS Available: Yes

Is this Waste Subject to Corrective Action/Exemption per 40 CFR Part 261: Yes No

Does this waste contain:
Listed Waste: Yes No
PCBs: Yes No
Reactive Sulfide: Yes No
Reactive Oxidizer: Yes No
Herbicide or Pesticide: Yes No

% Sludge: < 1
% Liquid: 797
Odor: Mild
Color: Varies/Black

Composition

Waste consists of chemical residues of methanol, acetone, and other organic solvents, pH (7-12.4)

Authorized Signature: [Redacted] 1/23/06

Northern A-1 Representative Signature of approval: [Redacted]

Approval Date: 1/23/06

Midland Office: 231/258-9961 tel = 231/258-9971 fax = 800/844-2869
Ann Arbor Office: 231/772-5301 tel = 231/772-5304 fax = 800/847-9154
P.O. Box 200: 231/757-0229 tel = 231/757-0229 fax = 800/634-1400

Disposal information: Disposal at [Redacted] in accordance with 40 CFR 261.12



Generator Waste Profile

Approval # _____

Generator Information

Generator Name: _____ Generator EPA ID: _____
 Facility Address: _____
 Contact Name: _____ Phone: _____ Fax: _____

Customer/Billing Address

Customer Name: AME
 Billing Address: _____
 Contact Name: _____ Phone: _____ Fax: _____

Waste Information

Waste Name: Wastewater
 Process Generating Waste: Chemical Manufacturing
 Petroleum for Recycle: Gasoline _____ Diesel _____ Oil _____
 Date of Last Analysis: _____ MSDS Available: _____
 Volume: 20 - 30,000 Gallons Frequency: Monthly

Is this Waste Subject to Corrective Action/Exemption per 40 CFR 261.24: Yes _____ No X

Does this waste contain:
 Lead: Yes No
 PCBs: Yes No
 Reactive Cyanide: Yes No
 Herbicides or Pesticides: Yes No

Physical Characteristics:
 % Solid 23 % Sludge 31 % Liquid >97
 Odor: Mild Color: Varies/Brown

Composition:

Process wastewater from chemical manufacture of quadruplex ammonium salts, ethylene sulfide, and hydroxyacetone (HSA), high ammonium content (>1500mg/l), high pH (7-12.4)

Generator certifies that all information submitted in this and all attached documents is complete and accurate, that all known or suspected hazards have been disclosed, and that the waste is not classified as hazardous according to 129 EPA and state regulations.

Printed Name: _____ Date: _____
 Authorized Signature: _____ Date: 1/23/06

Northern A-1 Representative Signature of approval: _____

Approval Date: _____ Expiration Date: _____

3947 N. * US-131 * P.O. Box 1030 * Kalkaska, Michigan 49759 * 231/258-9961 tel * 231/258-9971 fax * 800/544-2663
 1122 East Barney * Muskegon, Michigan 49444 * 231/728-3154 tel * 231/728-6201 fax * 800/847-3154
 P.O. Box 247 * Manistee, Michigan 49660 * 231/757-0256 tel * 231/757-0529 fax * 800/634-1400

- * Quadruplex ammonium bromide
- * ethyl propyl dimethyl ammonium chloride
- * Diethyl dimethyl ammonium methanesulfonate
- * Diethyl dimethyl ammonium bisulfate
- * phenyl trimethyl ammonium chloride

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

TRACE
ANALYTICAL LABORATORIES, INC.

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

March 12, 2019

Phone: [REDACTED]
Fax: [REDACTED]

RE: Trace ID: T19C017

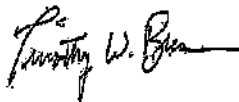
Dear [REDACTED]

Enclosed are your analytical results associated with your project for Vertellus WW / Tank. The results of this report relate only to the samples listed in the body of this report.

The results were obtained from Trident Environmental

Thank you for working with Trace. If you have questions concerning this report, please contact me at 231.773.5998 or by email at .

Sincerely,



Tim Brewer
Project Manager

Enclosures



NJDEP Accreditation No. M1008

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March 12, 2019



Subject: Water Samples for project number PFAS0304A

Dear 

Enclosed are your analytical results for the samples submitted and listed below. All reported results were obtained in accordance with the EPA Method 537M unless otherwise stated.

If you have any questions concerning this report, please contact us at (855) 875-2532 or by email at L.Rawlings@TridentBiometrics.com

Sincerely,

Trident Environmental, LLC

Definition of Terms

Abbreviation	Definition
EPA Method 537M-ID	A modified version of the EPA Method 537 to test for water using isotope dilution
PFAS	Poly and Perfluoroalkyl Substances
ppt	Parts per trillion
~	Recovery and/or RPD was outside laboratory acceptable limits
%	Instrument readout is outside of dynamic range of the calibration curve so value shown is an estimate
#	Smaller aliquot of sample was extracted to attempt to quantify high values, concentrations still exceed upper limit
L	Spiked concentration is lower than acceptable recovery
H	Spiked concentration is higher than acceptable recovery

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Sample Information Summary

Lab ID	Sample Description	Volume (mL)	Matrix	Project ID	Time Collected	Date Received
400857A		99.80 mL	Aqueous	JR031119A	2/28/2018 10:00:00	3/4/2019 9:30:00

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Analytical Results

Lab ID:	400887A	Date Collected:	2/28/2019
Sample Description:	[REDACTED]	Date Received:	3/4/2019
Batch Number:	JR031118A	Date Processed:	3/11/2019
Matrix:	Aqueous	Date Analyzed:	3/12/2019

Acronym	Analyte Name	Results	Reporting Limit	Dilution	Prepared By	Analyzed By	Note
4:2 FTS	4:2 Fluorotelomer Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
6:2 FTS	6:2 Fluorotelomer Sulfonic Acid	Not Detected	26.06 ppt	1.0	JR	CML	
8:2 FTS	8:2 Fluorotelomer Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
FOSA	Perfluorooctane Sulfonamide	Not Detected	26.06 ppt	1.0	JR	CML	
N-EFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	32.29 ppt	26.06 ppt	1.0	JR	CML	
N-MeFOBA	N-Methyl Perfluorooctane Sulfonamidoacetic Acid	42.87 ppt	26.06 ppt	1.0	JR	CML	
PFBA	Perfluorobutanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFBS	Perfluorobutane Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFDA	Perfluorododecanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFDoA	Perfluorododecanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFDS	Perfluorodecane Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFHpA	Perfluorohexanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFHpS	Perfluorohexane Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFHxA	Perfluorohexanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFHxS	Perfluorohexane Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFNA	Perfluorononanoic Acid	Not Detected	26.06 ppt	1.0	JR	CML	
PFNS	Perfluorononane Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFOA	Perfluorooctanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFOS	Perfluorooctane Sulfonic Acid	36.77 ppt	5.01 ppt	1.0	JR	CML	
PFPeA	Perfluoropentanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFPeS	Perfluoropentane Sulfonic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFTeDA	Perfluorotetradecanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFTrDA	Perfluorotridecanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	
PFUnDA	Perfluoroundecanoic Acid	Not Detected	5.01 ppt	1.0	JR	CML	

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Quality Control Results

Sample Description	Blank	Sample ID	3/11/2019
Batch Number	JR031110A	Date Analyzed	3/12/2019

Abbreviation	Chemical Name	Result	Method/CML	Analyst	Date
4:2 FTS	4:2 Fluorotelomer Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
6:2 FTS	6:2 Fluorotelomer Sulfonic Acid	Not Detected	10.00 ppt	JR	CML
8:2 FTS	8:2 Fluorotelomer Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
FOSA	Perfluorooctane Sulfonamide	Not Detected	10.00 ppt	JR	CML
NEFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	Not Detected	10.00 ppt	JR	CML
NMeFOSAA	N-Methyl Perfluorooctane Sulfonamidoacetic Acid	Not Detected	10.00 ppt	JR	CML
PFBA	Perfluorobutanoic Acid	Not Detected	2.00 ppt	JR	CML
PFBS	Perfluorobutane Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
PFDA	Perfluorodecanoic Acid	Not Detected	2.00 ppt	JR	CML
PFDoA	Perfluorododecanoic Acid	Not Detected	2.00 ppt	JR	CML
PFDS	Perfluorododecane Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
PFHpA	Perfluoroheptanoic Acid	Not Detected	2.00 ppt	JR	CML
PFHpS	Perfluoroheptane Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
PFHxA	Perfluorohexanoic Acid	Not Detected	2.00 ppt	JR	CML
PFHxS	Perfluorohexane Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
PFNA	Perfluorononanoic Acid	Not Detected	10.00 ppt	JR	CML
PFNS	Perfluorononane Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
PFOA	Perfluorooctanoic Acid	Not Detected	2.00 ppt	JR	CML
PFOS	Perfluorooctane Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
PFPeA	Perfluoropentanoic Acid	Not Detected	2.00 ppt	JR	CML
PFPeS	Perfluoropentane Sulfonic Acid	Not Detected	2.00 ppt	JR	CML
PFTeDA	Perfluorotetradecanoic Acid	Not Detected	2.00 ppt	JR	CML
PFTrDA	Perfluorotridecanoic Acid	Not Detected	2.00 ppt	JR	CML
PFUnDA	Perfluoroundecanoic Acid	Not Detected	2.00 ppt	JR	CML

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Quality Control Results

Sample Description:	Low Laboratory Control Sample	Date of Collection:	3/11/2019
Batch Number:	JR031119A	Date of Analysis:	3/12/2019

Acronym	Full Name	Sample Conc.	Lab Conc.	Recovery	Recovery Range	Note
4:2 FTS	4:2 Fluorotelomer Sulfonic Acid	10.00 ppt	10.87 ppt	108.70%	80% - 150%	
6:2 FTS	6:2 Fluorotelomer Sulfonic Acid	10.00 ppt	16.64 ppt	166.44%	50% - 150%	H
8:2 FTS	8:2 Fluorotelomer Sulfonic Acid	10.00 ppt	13.91 ppt	139.18%	50% - 150%	
FOSA	Perfluorooctane Sulfonamide	10.00 ppt	14.40 ppt	144.01%	50% - 150%	
N-EFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	50.00 ppt	52.78 ppt	105.56%	80% - 150%	
N-MeFOSAA	N-Methyl Perfluorooctane Sulfonamidoacetic Acid	50.00 ppt	74.34 ppt	148.69%	50% - 150%	
PFBA	Perfluorobutanoic Acid	10.00 ppt	11.71 ppt	117.10%	50% - 150%	
PFBS	Perfluorobutane Sulfonic Acid	10.00 ppt	14.81 ppt	148.08%	50% - 150%	
PFDA	Perfluorodecanoic Acid	10.00 ppt	14.87 ppt	148.67%	50% - 150%	
PFDoA	Perfluorododecanoic Acid	10.00 ppt	12.66 ppt	126.61%	50% - 150%	
PFDS	Perfluorodecane Sulfonic Acid	10.00 ppt	11.26 ppt	112.68%	50% - 150%	
PFHpA	Perfluorooheptanoic Acid	10.00 ppt	12.12 ppt	121.15%	50% - 150%	
PFHpS	Perfluorooheptane Sulfonic Acid	10.00 ppt	11.42 ppt	114.18%	50% - 150%	
PFHxA	Perfluorohexanoic Acid	10.00 ppt	10.98 ppt	109.49%	50% - 150%	
PFHxS	Perfluorohexane Sulfonic Acid	10.00 ppt	10.56 ppt	105.56%	50% - 150%	
PFNA	Perfluorononanoic Acid	10.00 ppt	9.84 ppt	98.40%	50% - 150%	
PFNS	Perfluorononane Sulfonic Acid	10.00 ppt	11.53 ppt	115.26%	50% - 150%	
PFOA	Perfluorooctanoic Acid	10.00 ppt	11.56 ppt	115.62%	50% - 150%	
PFOS	Perfluorooctane Sulfonic Acid	10.00 ppt	9.45 ppt	94.48%	50% - 150%	
PFPeA	Perfluoropentanoic Acid	10.00 ppt	11.39 ppt	113.86%	50% - 150%	
PFPeS	Perfluoropentane Sulfonic Acid	10.00 ppt	12.43 ppt	124.28%	50% - 150%	
PFTeDA	Perfluorotetradecanoic Acid	10.00 ppt	8.80 ppt	88.07%	50% - 150%	
PFTrDA	Perfluorotridecanoic Acid	10.00 ppt	8.79 ppt	87.92%	50% - 150%	
PFUnDA	Perfluoroundecanoic Acid	10.00 ppt	13.67 ppt	136.66%	50% - 150%	

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Quality Control Results

Sample Description:	High Laboratory Control Sample	Date Collected:	3/11/2019
Batch Number:	JRC3119A	Date Analyzed:	3/12/2019

Sample Name	Sample Name	Spiked Concentration	Result	Recovery	Reference Range
4:2 FTS	4:2 Fluorotelomer Sulfonic Acid	200.00 ppt	24.177 ppt	120.88%	50% - 150%
8:2 FTS	8:2 Fluorotelomer Sulfonic Acid	200.00 ppt	27.138 ppt	135.70%	50% - 150%
8:2 FTS	8:2 Fluorotelomer Sulfonic Acid	200.00 ppt	287.73 ppt	143.87%	50% - 150%
FOSA	Perfluorooctane Sulfonamide	200.00 ppt	243.68 ppt	121.85%	50% - 150%
N-EFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	1,000.00 ppt	96.32 ppt	65.93%	50% - 150%
N-MeFOSAA	N-Methyl Perfluorooctane Sulfonamidoacetic Acid	1,000.00 ppt	1305.92 ppt	130.59%	50% - 150%
PFBA	Perfluorobutanoic Acid	200.00 ppt	214.04 ppt	122.82%	50% - 150%
PFBS	Perfluorobutane Sulfonic Acid	200.00 ppt	330.42 ppt	165.21%	50% - 150%
PFDA	Perfluorodecanoic Acid	200.00 ppt	223.42 ppt	111.71%	50% - 150%
PFDA	Perfluorodecanoic Acid	200.00 ppt	206.51 ppt	103.26%	50% - 150%
PFDS	Perfluorodecane Sulfonic Acid	200.00 ppt	236.72 ppt	118.36%	50% - 150%
PFHpA	Perfluorohexanoic Acid	200.00 ppt	271.62 ppt	135.81%	50% - 150%
PFHpS	Perfluorohexane Sulfonic Acid	200.00 ppt	282.83 ppt	141.41%	50% - 150%
PFHxA	Perfluorohexanoic Acid	200.00 ppt	223.79 ppt	111.89%	50% - 150%
PFHxS	Perfluorohexane Sulfonic Acid	200.00 ppt	254.61 ppt	127.31%	50% - 150%
PFNA	Perfluorononanoic Acid	200.00 ppt	236.79 ppt	118.40%	50% - 150%
PFNS	Perfluorononane Sulfonic Acid	200.00 ppt	202.27 ppt	101.14%	50% - 150%
PFOA	Perfluorooctanoic Acid	200.00 ppt	240.48 ppt	120.24%	50% - 150%
PFOS	Perfluorooctane Sulfonic Acid	200.00 ppt	242.10 ppt	121.05%	50% - 150%
PFPeA	Perfluoropentanoic Acid	200.00 ppt	247.88 ppt	123.94%	50% - 150%
PFPeS	Perfluoropentane Sulfonic Acid	200.00 ppt	236.58 ppt	118.29%	50% - 150%
PFTeDA	Perfluorotetradecanoic Acid	200.00 ppt	170.92 ppt	85.46%	50% - 150%
PFTTrDA	Perfluorotridecanoic Acid	200.00 ppt	208.88 ppt	104.44%	50% - 150%
PFUnDA	Perfluoroundecanoic Acid	200.00 ppt	237.09 ppt	118.55%	50% - 150%

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Certificate of Analysis

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SAMPLE LOG IN CHECKLIST

Trace ID #: T19C017 Date: 8-1-19 Package Description: Cooler Temperature: 14.5
 Client Name: [REDACTED] Time: 1:50 PM Logged In by: MB

Cooler Receipt

Cooler/samples delivered by: Trace courier Hand delivered Commercial courier UPS FED EX US Mail

Name of delivery person: _____

Tracking Number: Not Applicable Tracking #: _____

COC Seals present and intact on cooler? Not Applicable No Yes

Custody seals signed by client? No Yes Client custody seal # (if applicable): _____

Coolant and Temperature

Type of Coolant Used

Slurry w/ crushed, cubed, or chip ice?

Multiple bags of ice around samples?

Ice Packs/ Blue Ice?

No Coolant Present?

Ice still present upon receipt (circle one):
 Yes No N/A

Cooler Temperature

Correction Factors: Digital Stick Thermometer CF = -0.6°C
 IR Thermometer CF = -0.8°C

Representative Sample Temperature: 13.8 °C (check one below)

Temp Blank (Stick Thermometer)
 Client Sample (IR Thermometer)

Melt Water: 0/4 °C (Use Digital Stick Thermometer)

	General			Comments
	Yes	No	N/A	
All bottles arrived unbroken with labels in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Each sample point is in a sealed plastic bag?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Labels filled out completely?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All bottle labels agree with Chain of Custody (COC)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sufficient sample to run tests requested?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
pH checked and samples at correct pH?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Below
Corrosive preservative added to samples?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Air bubbles absent from VOAs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
COC filled out properly and signed by client?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
COC signed in by TRACE sample custodian?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was project manager called and samples discussed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Notes: _____

EMD pH Test Strips Used:

pH 02.5 Lot: HC791462 pH 11.0-13.0 Lot: HG800881

Other: _____

CERTIFICATE OF ANALYSIS

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