



Environmental GEO-Technologies, LLC

February 28, 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-third 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 January, 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 interim 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.

rjp022819/EGTEPAMonthlyReport-January, 2019

AVERAGE INJECTION RATE

Calculation of Average Injection Rate

CURRENT REPORTING YEAR 2019

CURRENT REPORTING MONTH JANUARY

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	0	0	0
Since facility first injected			14,330,505
MI-163-1W-C011, Well #2-12			
Current Month	0	0	0
Since facility first injected			4,648,736
		Lifetime Combined	18,979,241

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 61

$$\text{_____ lifetime number of months of injection} \times 43,830 \text{ minutes/month} = \underline{2,629,800} \text{ minutes of injection}$$

$$\text{Lifetime combined injected volume } \underline{18,979,241} \div \underline{2,629,800} \text{ minutes of injection} = \underline{7.2} \text{ gpm average injection rate}$$

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 Differentail Pressure (PSIG)	Max Differentail Pressure (PSIG)
1/1/2019	2.3	2.7	22.0	22.3	843.3	843.9	13.6	13.6	0.0	0.0	840.9	841.3
1/2/2019	2.3	2.7	22.0	22.3	842.7	843.4	13.6	13.6	0.0	0.0	840.1	841.0
1/3/2019	2.4	2.6	22.0	22.3	842.2	842.8	8.2	13.6	0.0	0.0	839.6	840.3
1/4/2019	2.5	2.8	22.0	22.3	841.7	842.3	8.2	8.2	0.0	0.0	839.0	839.8
1/5/2019	2.4	2.7	22.0	22.3	841.4	842.1	8.2	8.2	0.0	0.0	838.7	839.5
1/6/2019	2.2	2.6	22.1	22.3	841.2	841.8	8.2	8.2	0.0	0.0	838.8	839.4
1/7/2019	2.3	2.9	22.0	22.3	840.5	841.3	8.2	8.2	0.0	0.0	837.7	838.9
1/8/2019	2.6	3.1	22.1	22.3	840.3	840.9	8.2	8.2	3.3	0.0	837.5	838.1
1/9/2019	2.3	2.8	22.0	22.3	838.5	840.4	8.2	8.2	0.0	0.0	836.0	837.7
1/10/2019	2.3	2.6	22.0	22.2	837.5	838.6	8.2	8.2	0.0	0.0	834.9	836.2
1/11/2019	2.3	3.5	22.0	22.2	836.9	837.6	8.2	8.2	0.0	0.0	833.9	835.0
1/12/2019	2.3	2.5	22.0	22.2	836.6	837.0	8.2	8.2	0.0	0.0	834.1	834.7
1/13/2019	2.3	4.4	22.0	22.2	835.9	836.7	8.2	8.2	0.0	0.0	831.5	834.3
1/14/2019	2.4	4.6	22.0	22.2	835.1	835.9	8.2	8.2	0.0	0.0	831.0	833.0
1/15/2019	2.4	2.7	22.1	22.2	834.8	835.3	8.2	8.2	0.0	0.0	832.2	832.8
1/16/2019	2.3	3.2	22.0	22.2	834.4	834.9	8.2	8.2	0.0	0.0	831.4	832.5
1/17/2019	2.6	3.1	22.0	22.2	834.0	834.5	8.2	8.2	0.0	0.0	831.1	831.6
1/18/2019	2.4	2.7	22.0	22.2	833.7	834.2	8.2	8.2	0.0	0.0	831.2	831.6
1/19/2019	2.4	5.6	22.0	22.2	832.6	833.8	8.2	8.2	0.0	0.0	827.0	831.3
1/20/2019	5.2	7.7	21.9	22.2	831.0	832.7	8.2	8.2	0.0	0.0	823.3	827.1
1/21/2019	4.3	8.2	21.8	22.2	830.4	831.1	8.2	8.2	0.0	0.0	822.5	826.6
1/22/2019	2.5	4.7	21.8	22.2	830.7	831.3	8.2	8.2	0.0	0.0	826.1	828.6
1/23/2019	2.8	3.7	-12.5	22.2	830.9	831.7	8.2	8.2	0.0	0.0	827.6	828.6
1/24/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2
1/25/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2
1/26/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2
1/27/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2
1/28/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2
1/29/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2
1/30/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2
1/31/2019	3.5	3.5	-12.5	-12.5	831.7	831.7	8.2	8.2	0.0	0.0	828.2	828.2

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

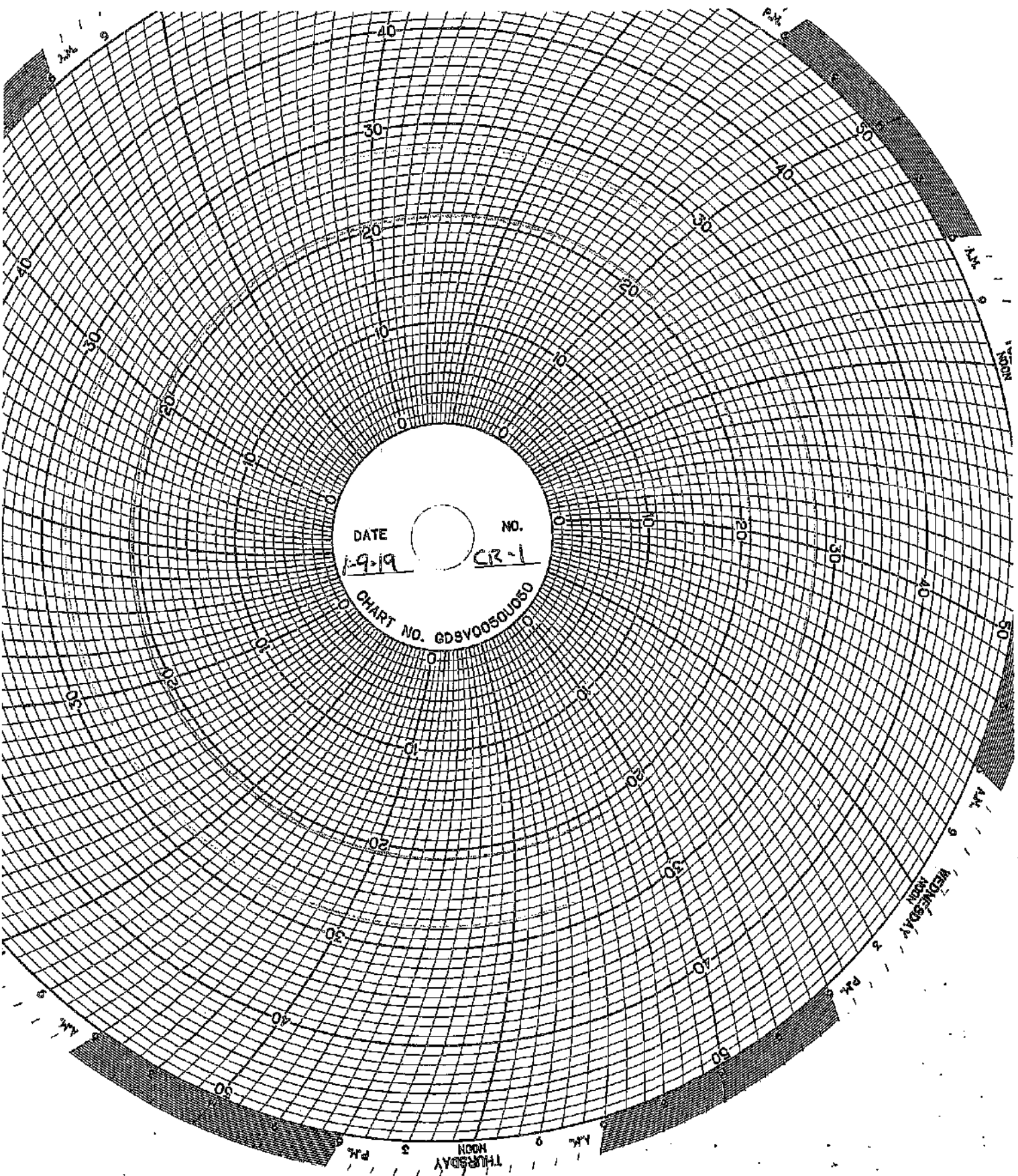
Red Pen - Well 1 Monthly Volume (chart value x 100,000)

Channel #3

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

Channel #4

Black Pen - Temperature (chart value x 0)



DATE 1-9-19 NO. CR-1

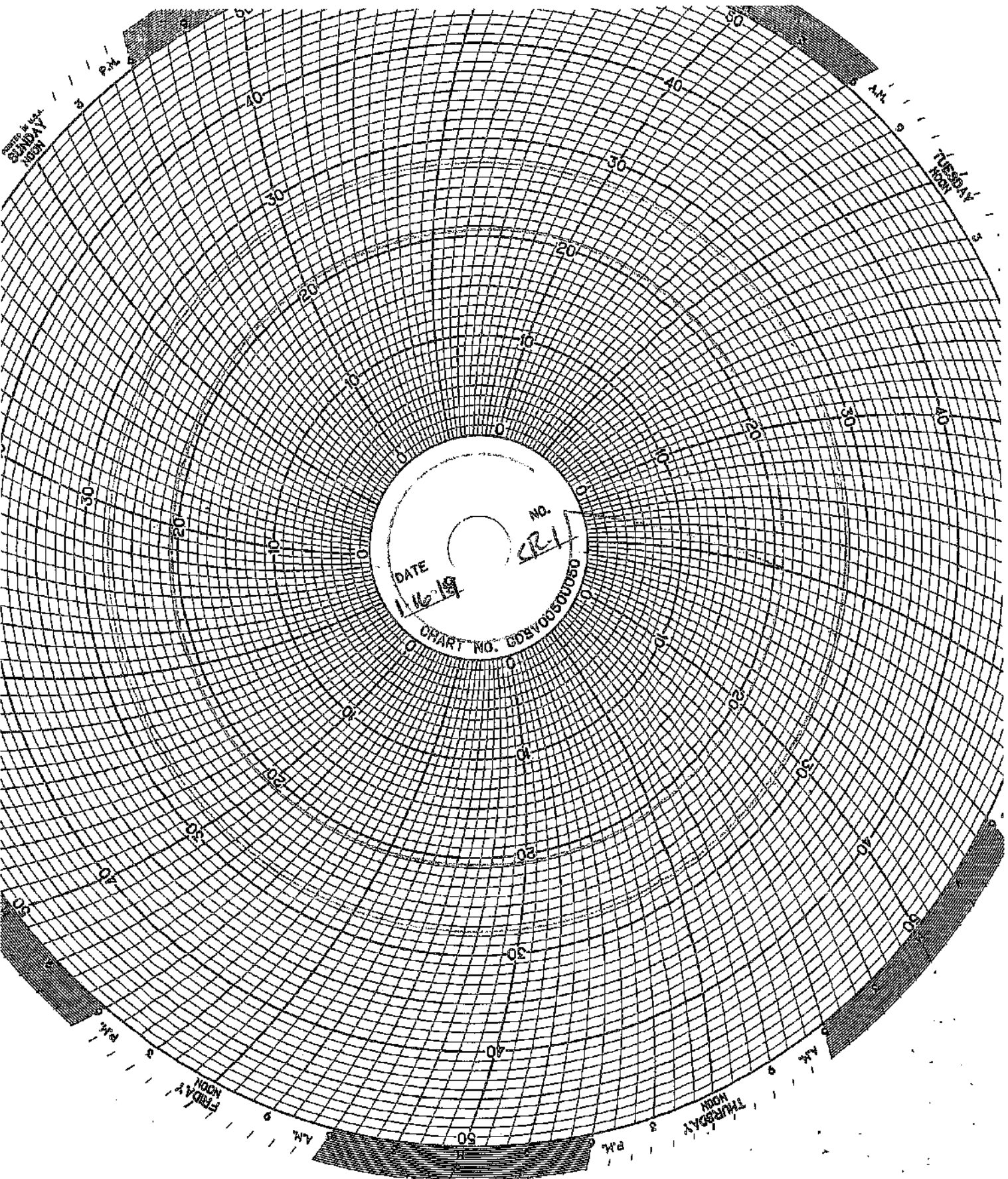
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THURSDAY

WEDNESDAY

TUESDAY

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DATE 1/16/19
NO. 211
CHART NO. 6030050050

SUNDAY 9 AM

TUESDAY 3 PM

THURSDAY 9 AM

FRIDAY 3 PM

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)
1/1/2019	0.0	0.0	13.7	13.8	0.0	0.0	13.6	13.6	0.0	0.0	0.0	0.0
1/2/2019	0.0	0.0	13.7	13.7	0.0	0.0	13.6	13.6	0.0	0.0	0.0	0.0
1/3/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	13.6	0.0	0.0	0.0	0.0
1/4/2019	0.0	0.0	13.3	14.2	0.0	0.1	8.2	8.2	0.0	0.0	0.0	0.1
1/5/2019	0.0	0.0	13.3	14.2	0.0	0.2	8.2	8.2	0.0	0.0	0.0	0.2
1/6/2019	0.0	0.0	13.3	14.1	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/7/2019	0.0	0.0	13.5	14.3	0.0	0.1	8.2	8.2	0.0	0.0	0.0	0.1
1/8/2019	0.0	0.0	13.4	14.3	0.0	0.2	8.2	8.2	0.0	0.0	0.0	0.2
1/9/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/10/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/11/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/12/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/13/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/14/2019	0.0	0.0	13.5	13.9	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/15/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/16/2019	0.0	0.0	13.7	13.9	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/17/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/18/2019	0.0	0.0	13.7	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/19/2019	0.0	0.0	13.6	14.0	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/20/2019	0.0	0.0	13.2	14.1	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/21/2019	0.0	0.0	13.2	14.1	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/22/2019	0.0	0.0	13.4	14.0	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/23/2019	0.0	0.0	-8.3	13.8	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/24/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/25/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/26/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/27/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/28/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/29/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/30/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0
1/31/2019	0.0	0.0	-8.3	-8.3	0.0	0.0	8.2	8.2	0.0	0.0	0.0	0.0

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

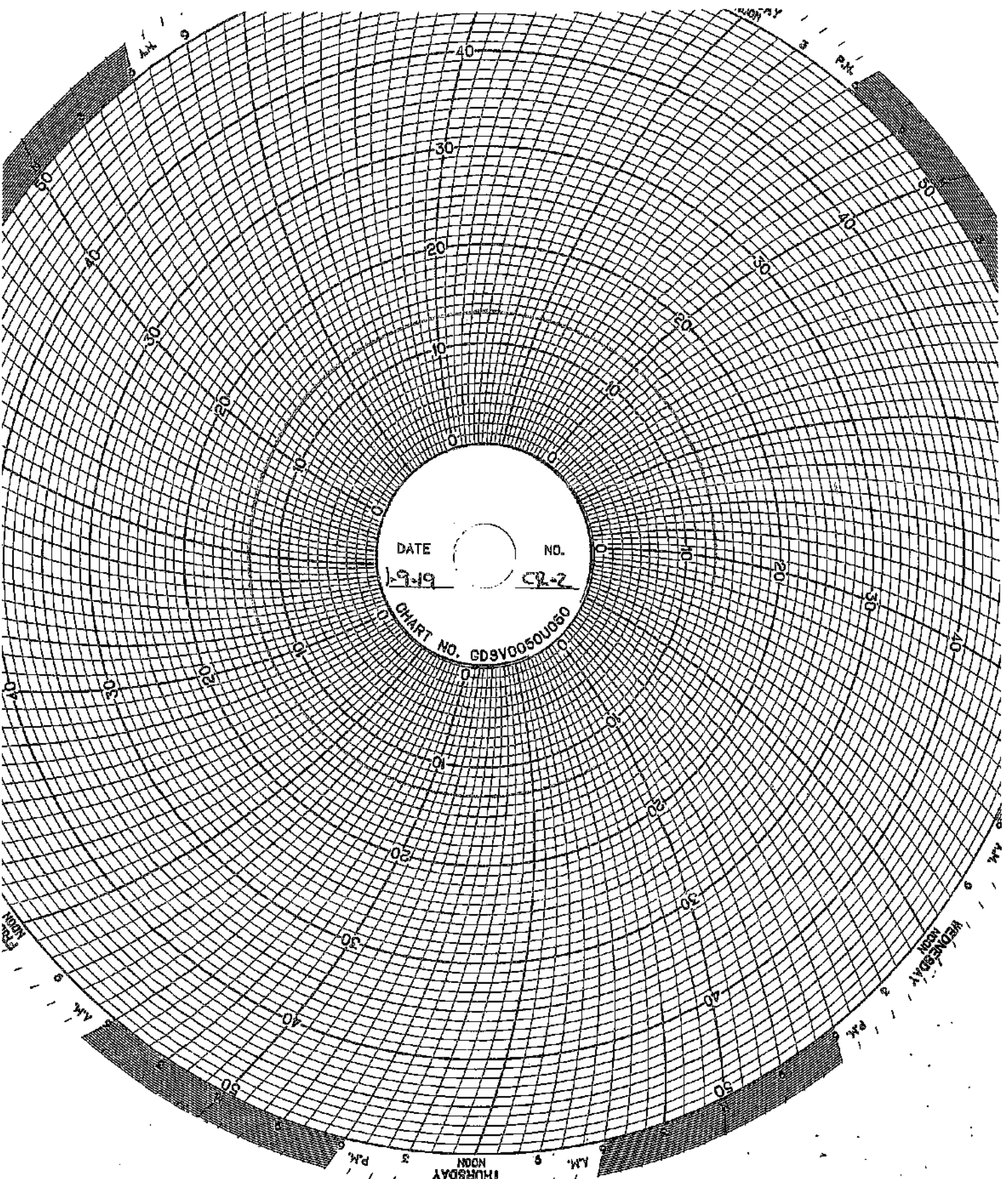
Red Pen - Well 1 Monthly Volume (chart value x 100,000)

Channel #3

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

Channel #4

Black Pen - Temperature (chart value x 0)



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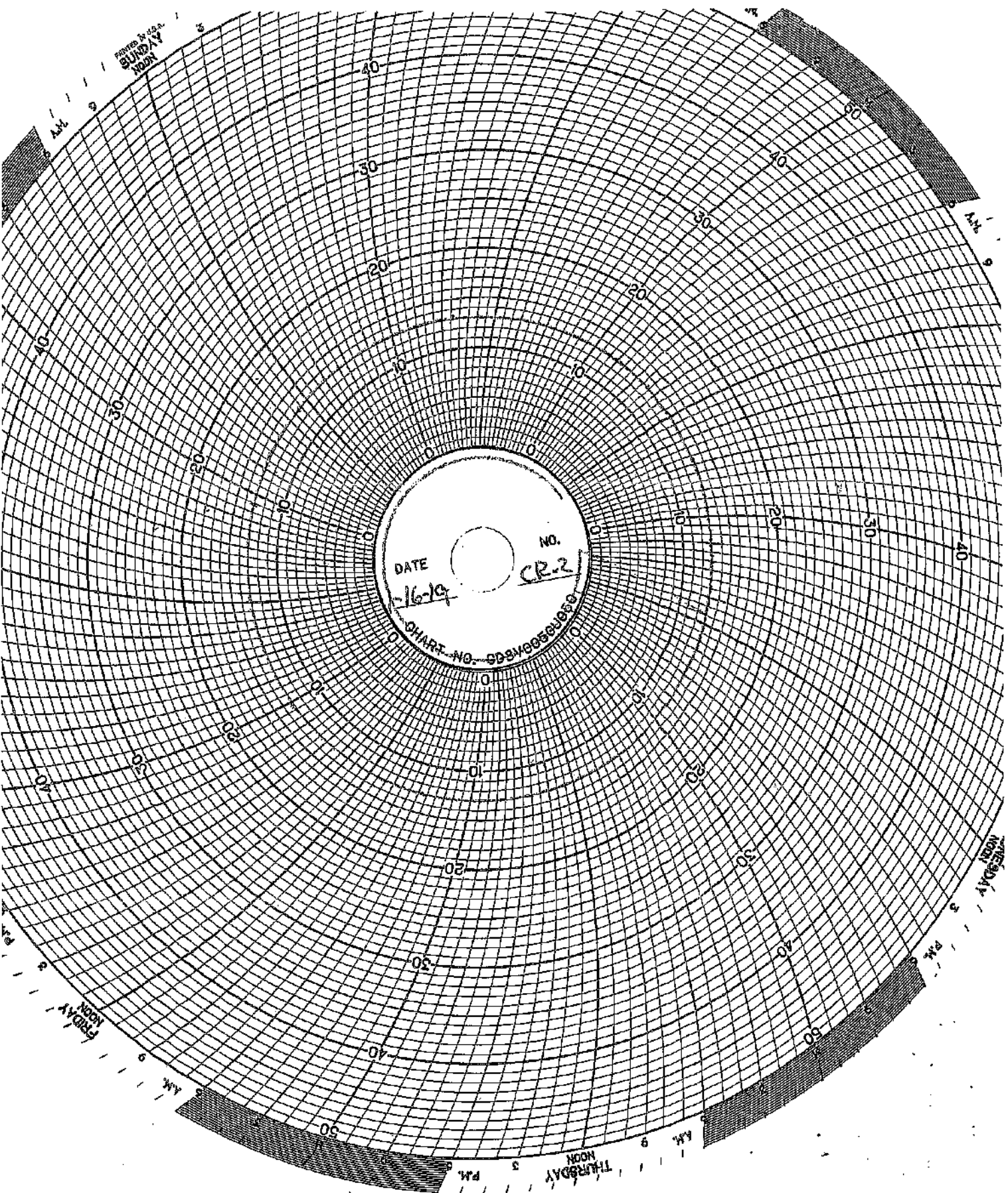
THURSDAY 9 A.M. 3 P.M. 9 P.M.
WEDNESDAY 9 A.M. 3 P.M. 9 P.M.

Printed by U.S.A.
SUNDAY
MORNING

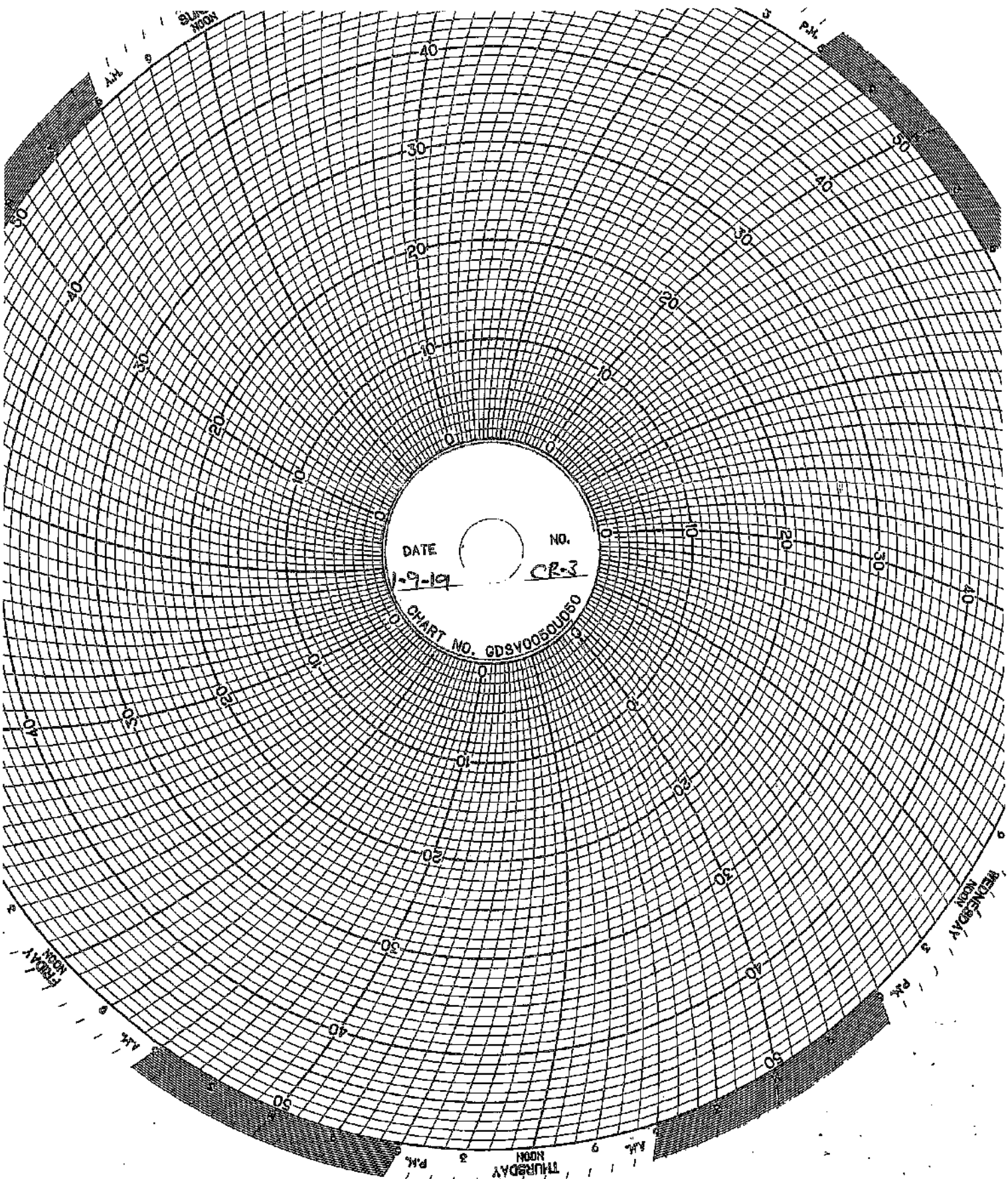
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NO.
CR-2

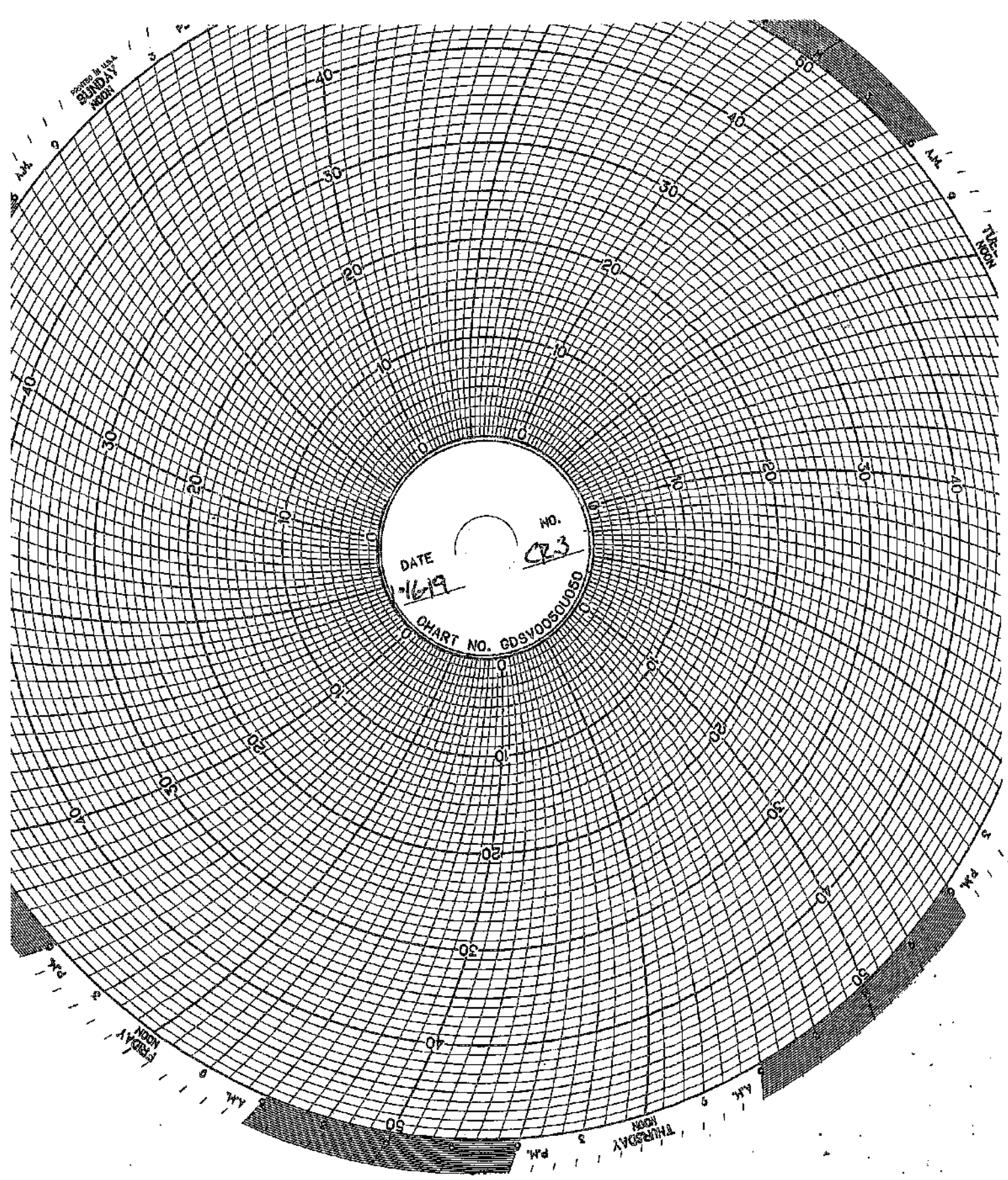
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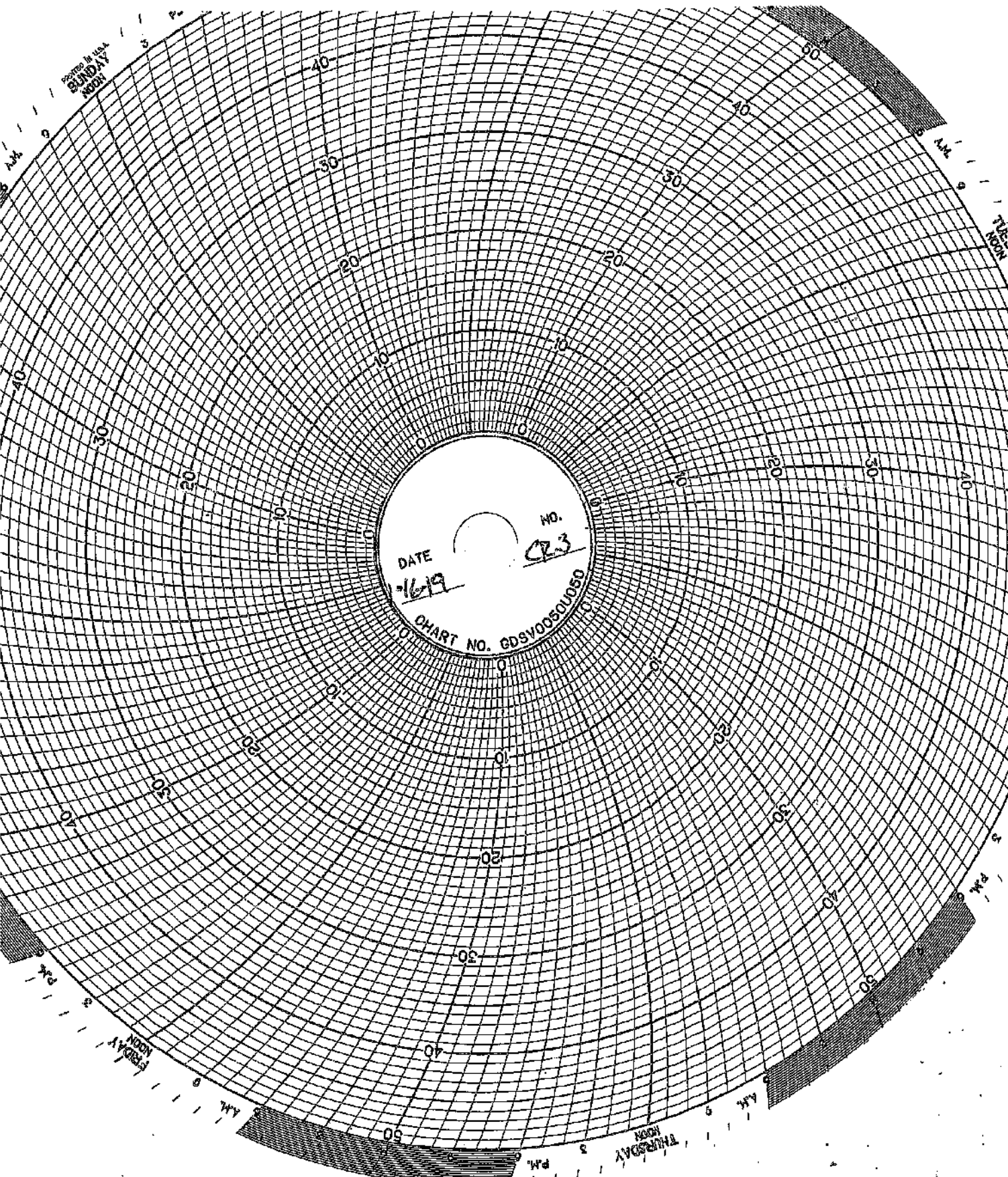
DATE 1-9-19 NO. CR-3
CHART NO. GDSV0050U650



Printed in U.S.A.
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NOON

11 AM

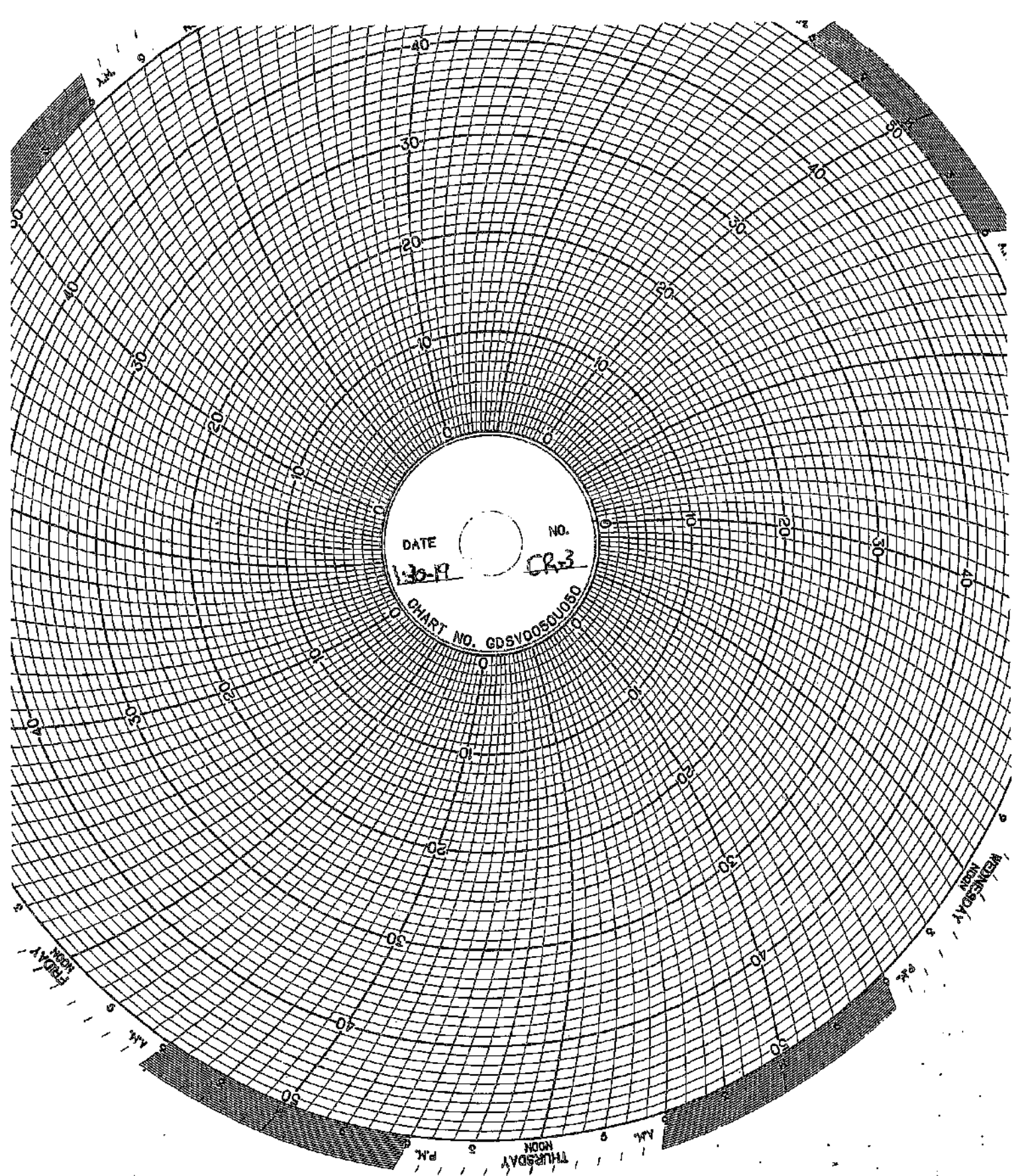
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11 AM

THURSDAY
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DATE 1-30-19 NO. CR-3
CHART NO. GDSV00501050

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THURSDAY
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SATURDAY
P.M. 5 8 A.M.

SUNDAY
P.M. 5 8 A.M.

MAINTENANCE LOG

UIC Monthly Maintenance Log

No Maintenance This Month

CORROSION MONITORING

CORROSION MONITORING COUPONS VISUAL DESCRIPTION

January, 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. No injection this month.

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. No injection this month.

Stainless Steel Coupon

No change since last month. No injection this month.

CORROSION MONITORING PLAN
COUPON SUMMARY

Date	Hastelloy	Stainless Steel	Fiberglass	
	(C267)	(316L)	(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	New hastelloy coupon
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	New stainless steel coupon
2/16/2016	13.332 g	8.799 g	6.757 g	
3/31/2016	13.339 g	9.286 g	7.005 g	
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	New Fiberglass coupon
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	
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	New stainless steel coupon
1/29/2018	13.326 g	10.930 g	18.027 g	
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	

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 C1562. 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.

GHESEQUIERE PLASTIC TESTING, INC.

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

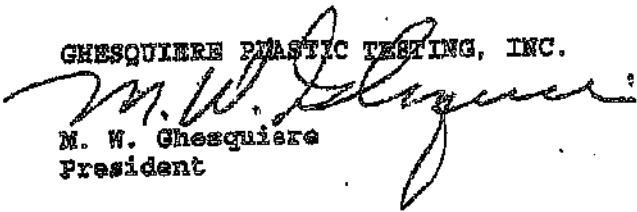
Hardness

Specimen 1

90

Specimen is being returned with this report for further evaluation.

GHESEQUIERE PLASTIC TESTING, INC.


M. W. Ghesquiere
President

DWG/kni

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TOTAL 1 PAGES

GHESEQUIERE PLASTIC TESTING, INC.

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

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

Report #1402-78036
Performed for:
Environmental Geo-Technologies
28470 Citrin Drive
Roxulus, 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:

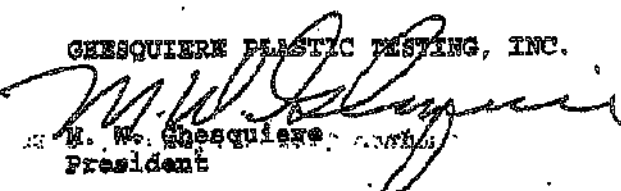
BARCOL HARDNESS

Hardness

Specimen 1: 90

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

GHESEQUIERE PLASTIC TESTING, INC.


M. W. Ghesquiere
President

NWG/dm

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TOTAL 1 PAGES

Ghesquiere Plastic Testing, Inc.

20450 HARPER AVENUE
HARPER WOODS, MI 48225
PHONE (313) 885-3635
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

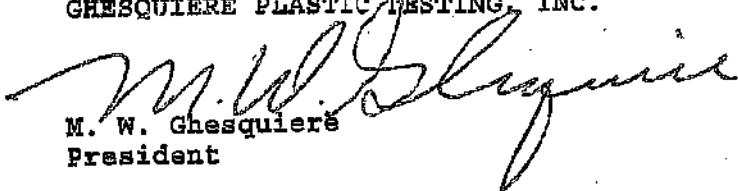
Specimen 1

Hardness

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:

[Signature]
Melissa Martin
Sr. Project Technician

Approved By:

[Signature]
Jim Drummond
Physical & Plastics Testing, Manager



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



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www.ardl.com

2887 Gilchrist Rd. | Akron, Ohio 44305 | answers@ardl.com
Toll Free (800) 630-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
PN118925

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) 794-6300 | Fax (330) 794-6610



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
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ISO 9001:2008
Registered

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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

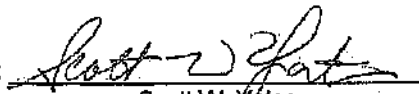
96

Prepared By:



Melissa Martin
Sr. Project Technician

Approved By:



Scott W. Yates
Plastics Testing Assistant Manager

to



Progress Through Innovation, Technology and Customer Satisfaction

December 12, 2016


TEST REPORT

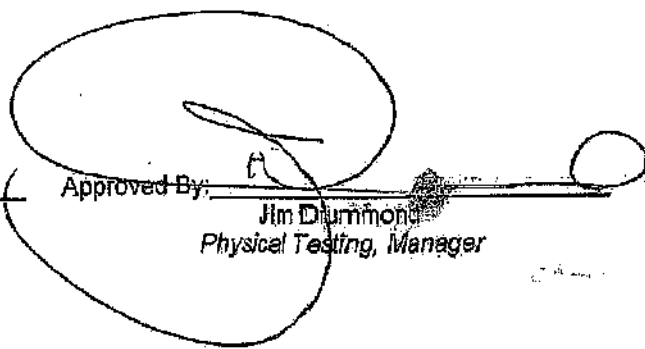
PN 132662
PO

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 Drummond
Physical Testing, Manager

Rev 041916



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December 12, 2016

John Frost
Environmental Geo-Technologies, LLC

Page 2 of 2
PN 132662

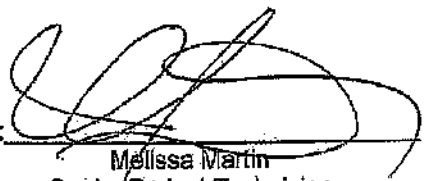
SUBJECT: Barcol Hardness on one (1) material.

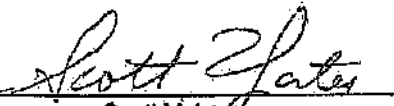
RECEIVED: One (1) small section identified as; Fiberglass Coupon.

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

ARDL is ISO 17025 accredited by A2LA for the test methods listed on the certificates referenced on page one. NOTE: Non-ISO 17025 accredited test methods are designated with the ^ symbol to differentiate from ISO 17025 accredited methods in the body of the test report.



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: [Signature]
Melissa Martin
Sr Project Technician

Approved By: [Signature]
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

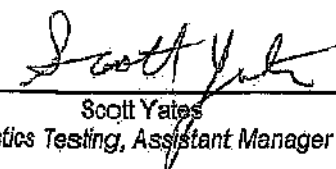
Barcol Hardness, Instant

96

Prepared By:


Melissa Martin
Sr Project Technician

Approved By:


Scott Yates
Plastics Testing, Assistant Manager

sc

ARDL is ISO 17025 accredited by A2LA for the test methods listed on the certificates referenced on page one. NOTE: Non-ISO 17025 accredited test methods are designated with the ^ symbol to differentiate from ISO 17025 accredited methods in the body of the test report.

**INJECTION
FINGERPRINTS**

**WASTE STREAMS
CHARACTERIZATIONS**

ENVIRONMENTAL GEO-TECHNOLOGIES, LLC

28470 Citrin Dr, Romulus, MI 48174. Telephone 734 946 1000. Fax 734 946 1002

Generator Waste Profile

Profile # **01394**

GENERATOR INFORMATION

Name: _____ USEPA ID# _____

Facility Address: _____ SIC/NAICS Code: _____ State Code: _____

City: _____ State: _____ Zip Code: _____

Contact: _____ Title: _____ Phone: _____ Fax: _____

BILLING INFORMATION

SAME AS ABOVE

Company Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Attention: _____ Phone: () _____ Fax: () _____

WASTE INFORMATION

Name of Waste/Common Chemical Name:

Fluoride Bulk Tank #4

Process Generating Waste (Please be specific, incomplete information may delay the approval process):

HFS ACCIDENTALLY MIXED IN AL₂(SO₄)₃ TANK

USEPA / STATE WASTE IDENTIFICATION

- This waste is considered to be: Non Hazardous Liquid Industrial Waste Hazardous Waste
- Regulated by TSCA? Yes No (PCBs, etc.)
- List ALL Applicable Waste Codes: D002

PHYSICAL CHARACTERISTICS OF WASTE

Color: <input checked="" type="checkbox"/> White/Clear <input type="checkbox"/> Black/Brown <input type="checkbox"/> Other _____	Suspended Solids <input checked="" type="checkbox"/> 0-1 % <input type="checkbox"/> 3-5 % <input 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 type="checkbox"/> 1.0-1.2 <input checked="" type="checkbox"/> 0.8-1.0 <input type="checkbox"/> 1.3-1.4 Exact / Other _____	<i>acceptable</i> <i>010319</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 - 0 PPM (MUST BE COMPLETED)

TOTAL COMPOSITION OF WASTE - MUST BE EQUAL TO OR GREATER THAN 100% (LIST EACH CONSTITUENT ≥ 0.1%)

CONSTITUENT	MAX	MIN	CONSTITUENT	MAX	MIN
<u>Hexafluoroarsinic Acid</u>	<u>85</u>	<u>80</u>			
<u>ALUMINUM SULFATE (ALUM)</u>	<u>20</u>	<u>15</u>			

Metals: Indicate if this waste contains any of the following metals. If Generator knowledge-provide backup

Lab Analysis Generator Knowledge TCLP TOTAL

Table with columns for metal names (PCB, Dioxins, Cyanides, etc.), presence status (Not Present, Present), and concentration (ppm). Includes a list of metals like Arsenic, Barium, Cadmium, etc.

TCLP Organics D012 - D043 above regulatory limits: Present Not Present

IS WASTE ANY OF THE FOLLOWING? At Least One Box Must Be Checked.

- Radioactive Water Reactive Oxidizer Shock Sensitive Reactive (other) DOT Explosives
NIOSH Human-Positive Carcinogens NESHAP Wastes (Benzene, etc.) Biological None Apply

SHIPPING INFORMATION

- 1. Is this a DOT Hazardous Material (49CFR 172.101 & 173 Subpart D)? Yes No
2. Reportable Quantity (RQ) in pounds
3. DOT Shipping Name RQ 3264 Waste Corrosive Liquid, Acidic, inorganic, n.o.s., (HFS), 8, PG I Hazard Class 8 UN 3264
PG I ERG Hazardous Constituents for "n.o.s." Hexafluorosilicic Acid
4. Method of Shipment Bulk Tanker Vac truck Rail Car Drums Totes
5. Number of Units to Ship Now: 8 6. Anticipated Volume / Units per Year: 20,000 gal or One Time
6. Special Handling Requirements including PPE:

CERTIFICATION STATEMENT

I hereby represent and warrant that I have personally examined and am familiar with the information contained and submitted in this and all attached documents. Based on my inquiry and personal knowledge of those individuals responsible for supplying or obtaining the information, the information contained herein is true, accurate, and complete to the best of my knowledge and belief.

Printed Name: [Redacted] Title: [Redacted]
Generator's Signature: [Redacted] Date: 12-2017

GENERATOR'S CHAIN OF CUSTODY RECORD INSTRUCTIONS: PLEASE collect a representative 1-quart sample of the waste described in the above referenced GENERATORS WASTE PROFILE REPORT using an appropriate container.

Form with fields for SAMPLING METHOD, COLLECTION POINT, SAMPLE COLLECTOR'S NAME, TITLE, EMPLOYER, Sample No., and Preservation status.

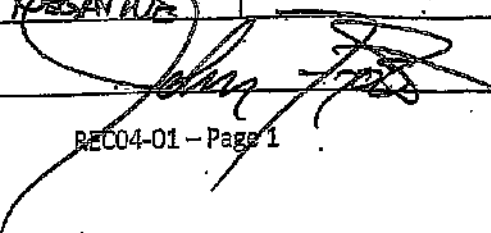
Table for CHAIN OF CUSTODY with columns: Relinquished by: (Signature), Date, Time, Received by: (Signature), Date, Time.

FINGERPRINT FORM

ENVIRONMENTAL GEO-TECHNOLOGIES, LLC.

RECEIVING & APPROVAL FORM

Date	1-3-19
Receiving ID#	[REDACTED]
Manifest# Line:	[REDACTED]
Land Ban Cert Included	Yes No
EGT Approval #	
Generator	[REDACTED]
Client	[REDACTED]
Transporter	
Time In	
Time out	
Received by	JKF
Sampled by	

Compatible? (RT#)	<input checked="" type="radio"/> Yes <input type="radio"/> No	Barium	
PCBs (ppm)(Oily Waste Only)?	NA	Calcium	
TOC (ppm)(CC Waste Only)?	NA	Total Iron	
Flash Point (°F)	< 140°F	Magnesium	
pH (S.U.)	0	Sodium Chloride	
Cyanides? (mg/L)	< 30	Bicarbonate	
Sulfides? (ppm)	< 200	Carbonate	
Specific Gravity	1.21	TDS	
Physical Description	Liquid	Resistivity	
Stream Consistency	Yes <input type="radio"/> No <input type="radio"/>	Sulfate	
Oil in Sample	Yes <input type="radio"/> No <input checked="" type="radio"/>		
Temperature	63°F		
Conductivity	306.5 mS		
% Solids	< 0.1		
Turbidity	Yes <input type="radio"/> No <input checked="" type="radio"/>		
Color (visual)	None		
TSS (%)	< 5		
Radiation Screen (as needed)	None		
Lab Signature			

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION**Product Identifier****Product Name:** Fluorosilicic Acid**Synonyms:** Hydrofluorosilicic Acid, Hexafluorosilicic Acid, Hydrosilicofluoric Acid**Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:****Product Use:** Various commercial and industrial uses**Manufacturer:****UNIMIN CORPORATION**

258 Elm Street

New Canaan, CT 06840

Emergency Telephone Number

(203) 966-8880

Telephone Number for Information

(203) 966-8880

SDS Date of Preparation/Revision: April 2014**SECTION 2: HAZARDS IDENTIFICATION****GHS/ Hazcom 2012 Classification:**

Physical:	Health:	Environmental
Not Hazardous	Acute Toxicity Category 3 (Dermal) Acute Toxicity Category 4 (Oral, Inhalation) Skin Corrosion Category 1	Not Hazardous

GHS/Hazcom 2012 Label:**DANGER!****Statements of Hazard**

Harmful if swallowed.

Toxic in contact with skin.

Harmful if inhaled

Causes severe skin burns and eye damage.

Response:**IF ON SKIN (or hair):** Take off immediately all contaminated clothing. Rinse skin with soap and water.

Wash contaminated clothing before reuse.

Immediately call a POISON CENTER or doctor.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER or doctor.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Immediately call a POISON CENTER or doctor.

Call a POISON CENTER or doctor.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Immediately call a POISON CENTER or doctor.

Storage:

Store locked up.

Disposal:

Dispose of contents/containers in accordance with local regulation

Prevention:

Do not breathe mist, vapors, or spray.

Wash exposed skin thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear protective gloves, protective clothing, eye protection, and face protection.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

CAS#	Component	Percentage
7732-18-5	Water	74%
16961-83-4	Fluorosilicic Acid	10-30%
7647-01-0	Hydrochloric Acid	<3%
7664-39-3	Hydrofluoric Acid	<1%

SECTION 4: FIRST AID MEASURES

Gross Inhalation: Remove victim to fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult have qualified personnel administer oxygen. Get immediate medical attention. Lung effects may be delayed – medical observation is recommended.

Skin Contact: Immediately remove all contaminated clothing and shoes. Flush skin thoroughly with water for at least 15 minutes. Launder clothing before reuse. Discard contaminated items, such as shoes, that cannot be decontaminated. Get immediate medical attention. Skin effects may be delayed.

Eye Contact: Flush the eyes immediately with large amounts of running water, lifting the upper and lower lids occasionally for at least 15 minutes. Get immediate medical attention.

Ingestion: If the victim is conscious, rinse mouth with water and give one glass of water or milk to drink. Do not induce vomiting. Do not give anything by mouth to an unconscious or convulsing person. Get immediate medical attention.

Most Important Symptoms and Effects, Both Acute and Delayed: Corrosive. May cause burns to the eyes and skin. Skin burns may not be apparent or painful for several hours. Inhalation of vapors or mists may cause severe mucous membrane and respiratory irritation with possible lung damage. May be harmful or fatal if swallowed. Effects of overexposure may be delayed. Chronic exposure may cause fluorosis with effects on the teeth and bones.

Indication of immediate medical attention and Special Treatment Needed: If any contact occurs, get immediate medical attention.

SECTION 5: FIREFIGHTING MEASURES

Suitable Extinguishing Media: This product will not burn but is compatible with all extinguishing media. Use any media that is appropriate for the surrounding fire.

Specific Hazards Arising from the Chemical:

Unusual Fire and Explosion Hazards: This product is a water solution and is not flammable. Thermal decomposition may yield flammable, corrosive and toxic gases. This product may react with metals to form flammable and explosive hydrogen gas.

Hazardous Combustion Products: Thermal decomposition yields hydrogen silica tetrafluoride and hydrogen fluoride gas.

Special Protective Equipment and Precautions for Fire-Fighters: Prevent contact with eyes, skin and clothing. Firefighters should wear self-contained breathing apparatus and full protective clothing.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective equipment.

Environmental Precautions: Report spills and releases as required to appropriate authorities.

Methods and Material for Containment/Cleanup: Ventilate area. Contain spill and collect with absorbent material and place in appropriate container for disposal. Flush spill area with water.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling: Avoid creating and breathing mists. Avoid breathing vapors. Prevent eye, skin and clothing contact. Wash thoroughly with soap and water after handling.

Use only with adequate ventilation. Maintain and use proper, clean protective equipment (See Section 8). Launder contaminated clothing before reuse. **WARN and TRAIN** employees in accordance with state and federal regulations.

WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS AND USERS IN CASE OF RESALE) BY POSTING, AND OTHER MEANS, OF THE HAZARDS AND OSHA PRECAUTIONS AND ANY OTHER APPLICABLE REGULATORY PRECAUTIONS TO BE USED. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT OSHA PRECAUTIONS.

Conditions for Safe Storage, Including any Incompatibilities: Store in a cool, dry, well-ventilated area. Keep away from metals. Reaction with metals will generate flammable hydrogen gas.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Definitions:

MSHA means Mine Safety and Health Administration.

NIOSH means National Institute for Occupational Safety and Health.

OSHA means Occupational Safety and Health Administration.

PEL means OSHA Permissible Exposure Limit.

REL means the NIOSH Recommended Exposure Limit.

TLV means American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value.

TWA means time-weighted average.

Fluorosilicic Acid: PEL – 2.5 mg/m³ TWA (as Fluorides)
 TLV- 2.5 mg/m³ TWA (as Fluorides)
 MSHA - 2.5 mg/m³ TWA (as Fluorides)

Hydrochloric Acid: PEL - 5 ppm Ceiling
 TLV- 2 ppm Ceiling
 MSHA - 5 ppm Ceiling

Hydrofluoric Acid: PEL – 3 ppm TWA
 TLV- 0.5 ppm TWA, 2 ppm Ceiling skin (as F)
 MSHA - 3 ppm TWA

Appropriate Engineering Controls: Use local exhaust as required to maintain exposures below applicable occupational exposure limits. See also ACGIH "Industrial Ventilation - A Manual for Recommended Practice" (current edition). Control of exposure must be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general or local exhaust ventilation and substitution of less toxic materials).

Personal Protective Equipment:

Respiratory Protection: When effective engineering controls are not feasible, or while they are being implemented, appropriate respiratory protection must be used. Use appropriate respiratory protection for respirable particulates based on

consideration of airborne workplace concentrations and duration of exposure arising from intended end use. Refer to the most recent government and local standards.

Gloves: Chemical resistant gloves recommended.

Eye Protection: Chemical safety goggles and/or face shield recommended.

Other Protective Equipment/Clothing: Chemical resistant clothing and boots as needed to prevent skin contact. A safety shower and eye wash should be available in the work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquid	Appearance:	Water white to straw yellow
Viscosity:	Not applicable	Odor:	Pungent odor
pH:	Not applicable	Odor Threshold:	Not applicable
Boiling Point/Range:	105.56°C / 222°F	Vapor Density:	Not applicable
Melting point/freezing point:	-20°C / -4°F	Evaporation Rate:	Not applicable
Flammability (solid, gas):	Water solution, will not burn	Partition coefficient (n-octanol/water):	Not applicable
Decomposition Temperature:	Non-combustible	Vapor Pressure:	218 mmHg @ 75°
Flash Point:	Not applicable	Relative Density:	1.223
Lower Explosion Limit:	Not applicable	Solubilities:	Completely soluble in water
Upper Explosion Limit:	Not applicable	Autoignition Temperature:	Non-combustible

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Reacts with metals to form flammable hydrogen gas.

Chemical Stability: This product is stable at normal temperatures.

Possibility of Hazardous Reactions: Contact with metals may form flammable hydrogen gas.

Conditions to Avoid: None

Incompatible Materials: Metals, glass, stoneware, alkali, strong concentrated acids.

Hazardous Decomposition Products: Thermal decomposition yields hydrogen silica tetrafluoride and hydrogen fluoride gas.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects

Potential Health Effects:

Inhalation: Inhalation of vapors or mists may cause severe irritation of the nose, throat and respiratory passages. High concentrations may cause lung damage (edema) with symptoms of chest pain and difficulty breathing. The effects may be delayed for several hours and are aggravated by physical exertion.

Skin Contact: May cause severe irritation and chemical burns. Burns may not be apparent for several hours.

Eye Contact: Contact may cause severe irritation or chemical burns with possible permanent damage.

Ingestion: Swallowing may cause irritation and burns to the mouth, throat and gastrointestinal tract with nausea, weakness and shock. Severe damage, which may be fatal, may occur.

Chronic Health Effects: Prolonged absorption of fluorides may result in fluorosis. Symptoms include changes in bone density (osteosclerosis), ossification of ligaments and mottling of the dental enamel.

Signs and Symptoms of Exposure: Overexposure to mists may cause mucous membrane and respiratory irritation, cough, sore throat, nasal congestion, sneezing and shortness of breath. Eye and skin contact may cause redness, burning, pain and swelling.

Acute Toxicity Values: Fluorosilicic Acid: LD50 oral rat 430 mg/kg
Hydrochloric Acid: LC50 Inhalation rat 3124 ppm/ 1 hour.
Hydrofluoric Acid: LC50 Inhalation rat 1276 ppm/1 hr

Skin Sensitization: Not a skin sensitizer in animals or humans.

Repeated Dose Toxicity: No specific data is available.

Carcinogenicity: None of the components of this product are listed as carcinogens or suspected carcinogens by IARC, NTP or OSHA.

Developmental / Reproductive Toxicity: No specific data is available.

Genetic Toxicity: No specific data is available.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity: Fluorosilicic Acid: Lepomis macrochirus 96hr LC50: 50 mg/L; Daphnia magna 48hr EC50: 270 mg/L
Hydrofluoric Acid: Oncorhynchus mykiss: 96hr LC50 51 mg/L; Daphnia magna 48hr EC50: 26-48 mg/L

Persistence and Degradability: This product is expected to be highly degradable.

Bioaccumulative Potential: Not expected to bioaccumulate.

Mobility in Soil: Not applicable.

Results of PBT and vPvB Assessment: None required.

Other Adverse Effects: None known

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Treatment Methods:

This product, as produced, is classified as a hazardous waste under US EPA RCRA regulations – characteristic corrosive (D002). Dispose in accordance with all applicable local, state/provincial and federal regulations. Local regulations may be more stringent than regional and national requirements. It is the responsibility of the waste generator to determine the toxicity and physical characteristics of the material to determine the proper waste identification and disposal in compliance with applicable regulations.

SECTION 14: TRANSPORT INFORMATION

U.S. DOT HAZARD CLASSIFICATION

Proper Shipping Name: Fluorosilicic Acid

Technical Name: N/A

UN Number: UN1778

Hazard Class/Packing Group: 8, 11
Labels Required: Corrosive
DOT Packaging Requirements: 173.202, 173.242
Exceptions: None

SECTION 15: REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Acute health

SARA 313 This Product Contains the Following Chemicals Subject to Annual Release Reporting Requirements Under the SARA Section 313 (40 CFR 372): Hydrochloric Acid <3%, Hydrofluoric Acid <1%

CERCLA Section 103 Reportable Quantity: Product: 10,000 lbs. (Hydrofluoric Acid 100 lbs.)

California Proposition 65: This product does not contain substances regulated under California Proposition 65.

Toxic Substances Control Act: All of the components of this product are listed on the EPA TSCA Inventory or exempt from premanufacture notification requirements.

EU Inventory: All of the components of this product are listed on the EINECS inventory or exempt from notification requirements.

EU REACH Status: This substance is exempt from REACH registration.

Canadian Environmental Protection Act: All the components of this product are listed on the Canadian Domestic Substances List or exempt from notification requirements.

Canadian WHMIS Classification: Not a controlled product

This SDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the SDS contains all of the information required by the CPR.

Japan METI: All of the components of this product are existing chemical substances as defined in the Chemical Substance Control Law.

Australian Inventory of Chemical Substances: All of the components of this product are listed on the AICS inventory or exempt from notification requirements.

Australian National Occupational Health & Safety Commission Status: Hazardous according to the criteria of Australian National Occupational Health & Safety Commission – Corrosive C, Toxic T, R21/22 Harmful in contact with the skin and if swallowed, R23 Toxic by inhalation R35 Causes severe burns.

Korea: All of the components of this product are listed on the KECL inventory or exempt from notification requirements.

Philippines: All of the components of this product are listed on the PICCS inventory or exempt from notification requirements.

New Zealand: All of the components of this product are listed on the HSNO inventory or exempt from notification requirements.

China: All of the components of this product are listed on the IECSC inventory or exempt from notification requirements.

Taiwan: All of the components of this product are listed on the CSNN inventory or exempt from notification requirements.

16: OTHER INFORMATION

NFPA Hazard Rating: Health: 3 Fire: 0 Reactivity: 0

HMIS Hazard Rating: Health: 3 Fire: 0 Reactivity: 0

References:

Registry for Toxic Effects of Chemical Substances (RTECS), 2014
Patty's Industrial Hygiene and Toxicology
NTP Twelfth Report on Carcinogens, 2011
Hazardous Substances Data Bank (HSDB), 2014

SDS Date of Preparation/Revision: April 2014

Revision Summary: Conversion to US Hazcom 2012 format – GHS Classification added.

The data in this Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information set forth herein is based on technical data the Unimin Corporation believes reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside the control of Unimin Corporation, no warranties, expressed or implied, are made and no liability is assumed in connection with any use of this information. Any use of these data and information must be determined by the user to be in accordance with federal, state and local laws and regulations.



Material Safety Data Sheet

NFPA	HMIS	PPE	Symbol(s)
			Regulated

Preparation Date August 14, 2008

Revision Date

Revision Number: 0

Product Name: Liquid Alum

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Liquid Alum

Other/Generic Names: Aluminum sulfate, aqueous solution

Recommended Use: Water treatment. Various industrial uses.

Manufacturer

General Chemical, LLC
 90 East Halsey Road
 Parsippany, NJ 07054

General Chemical Performance Products Ltd.
 90 East Halsey Road
 Parsippany, NJ 07054

Further information

FOR MORE INFORMATION CALL:
 Customer Service US ONLY: 800-631-8050
 (Monday-Friday, 9:00am - 4:30pm)

Customer Service CANADA ONLY: 866-543-3896
 (Monday-Friday, 9:00am - 4:30pm)

Emergency Telephone Number

IN CASE OF EMERGENCY CALL CHEMTREC: 800-424-9300 US ONLY
 24 Hours/Day, 7 Days/Week) CANADA ONLY CALL CANUTEC: 613-996-6666
 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A clear, odorless light green or amber liquid. Can irritate the skin and eyes. Not flammable, but may release toxic vapors if decomposed in a fire.

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential Health Effects

Skin: May cause skin irritation.

Eyes: May strongly irritate or burn the eyes.

Inhalation: Product mists may cause irritation to the respiratory tract.

Ingestion: May irritate the gastrointestinal tract. Concentrated solutions may cause burns to the digestive tract.

Delayed Effects: None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No	Weight %
aluminum sulfate	10043-01-3	~48.5

4. FIRST AID MEASURES

Eye Contact Immediately flush eyes with water for at least 15 minutes. Get medical attention if irritation persists.

Skin Contact: Flush with plenty of water, removing contaminated clothing. If irritation develops, get medical attention.

Inhalation: Remove victim immediately to fresh air.

Ingestion: If conscious, immediately give large quantity of water or milk. Do not induce vomiting. Get medical attention immediately.

Notes to Physician Treat symptomatically.

5. FIRE FIGHTING MEASURES**Flammable Properties**

Flash Point: Not flammable
FLASH POINT METHOD: Not applicable
Autoignition Temperature Not applicable
UPPER FLAME LIMIT (volume % in air): Not applicable
LOWER FLAME LIMIT (volume % in air): Not applicable
FLAME PROPAGATION RATE (solids): Not applicable
OSHA FLAMMABILITY CLASS: Not applicable

Suitable Extinguishing Media

Product is not flammable. Use any extinguishing agent suitable for surrounding fire.

Unsuitable Extinguishing Media

No information available.

Explosion Limits**Hazardous Combustion Products**

No information available

Impact sensitivity

No information available

Sensitivity to static discharge

No information available

Specific Hazards Arising from the Chemical

Keep product and empty container away from heat and sources of ignition.

Protective Equipment and Precautions for Firefighters

Use self-contained breathing apparatus. Use water spray to keep containers cool.

NFPA

Health 2

Flammability 0

Instability 1

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

(See Section 8 for recommended personal protective equipment.) Dilute small spills or leaks cautiously with plenty of water. Neutralize any further residue with alkali such as soda ash, lime or limestone. Adequate ventilation is required if soda ash or limestone is used, because of the consequent release of carbon dioxide gas. Large spills: dike up with soda ash and neutralize as above. Collect liquid and/or residue and dispose of in accordance with applicable regulations.

7. HANDLING AND STORAGE

Handling

Avoid contact with skin, eyes and clothing. Do not breathe product mists.

Storage

Store in a cool area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Component	ACGIH TLV	OSHA PEL	Ontario TWAEV	Mexico OEL (TWA)	NIOSH IDLH
aluminum sulfate 10043-01-3				TWA: 2 mg/m ³	

Engineering Measures

Use local exhaust to keep airborne concentrations below the permissible exposure limits.

Personal Protective Equipment

Eye/Face Protection

Wear chemical safety goggles or face shield to prevent eye contact. Do not wear contact lenses.

Skin Protection

Wear appropriate personal protective clothing to prevent skin contact. If prolonged or repeated contact is anticipated, all clothing should be impervious to liquid.

Respiratory Protection

A respiratory protection program that meets OSHA 1910.134 and ANSI Z89.2 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use. NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.

General Hygiene Considerations

To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment in accordance with the OSHA PPE Standard (29CFR1910.132) be conducted before using this product. Eyewash and safety showers are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

No information available

Color

Clear, light green or amber

Chemical Formula

48.5% Al₂(SO₄)₃ * 14H₂O in water

Odor

Odorless

Odor Threshold

No information available

Physical State

Liquid

pH	~3.5 (1% solution)
Flash Point:	Not flammable
Autoignition Temperature	Not applicable
Boiling Point/Range	101 °C
Melting Point/Range	-16 °C
Flammability Limits in Air	No information available
Explosive Properties	No information available
Oxidizing Properties	No information available
Evaporation Rate	Not determined
Vapour Pressure	Not applicable
Vapour Density	Not applicable
Specific Gravity	1.335
Solubility	No information available
Partition Coefficient (n-octanol/water)	No information available
Viscosity	No information available
Molecular Weight	~594 for Al ₂ (SO ₄) ₃ * 14H ₂ O
Water Solubility	100
VOC Content(%)	~50

10. STABILITY AND REACTIVITY

Chemical Stability	Normally stable. If evaporated to dryness, residue should not be exposed to elevated temperatures (above 760°C), as this will yield toxic and corrosive gases.
Incompatible Products	Alkalis and water reactive materials such as oleum: causes exothermic reactions.
Hazardous Decomposition Products	At elevated temperatures, sulfur oxides may be formed. These are toxic and corrosive and are oxidizers. Sulfur trioxide is also a fire hazard. The loss of these gases leaves a caustic residue.
Possibility of Hazardous Reactions	Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

LD50 Oral: (oral-mouse): 6207 mg/kg
(oral-rat): 1930 mg/kg

Component Information

Irritation	No information available
Corrosivity	No information available.
Sensitization	No information available.

Chronic Toxicity

Carcinogenicity There are no known carcinogenic chemicals in this product.

Mutagenic Effects No information available.

Reproductive Effects	No information available.
Developmental Effects	No information available.
Teratogenicity	No information available.
Target Organ Effects	No information available
Endocrine Disruptor Information	

12. ECOLOGICAL INFORMATION

Ecotoxicity

Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
aluminum sulfate		LC50= 100 mg/L goldfish 96 h		

Persistence and Degradability	No information available.
Bioaccumulation	No information available.
Mobility in Environmental Media	No information available
Other adverse effects	14 ppm/36 hr./fundulus/fatal/fresh water; 240 ppm/48 hr./mosquito fish/TLM/water type not specified; TLM Mosquito fish, 235 ppm, 96 hours; LC50 Largemouth bass, 250 ppm, 96 hours

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods	If permitted by regulations, material may be neutralized with alkali. The information offered in Section 13 is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.
Contaminated Packaging	Empty containers should be taken for local recycling, recovery or waste disposal.
US EPA Waste Number	No information available

Component	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
aluminum sulfate - 10043-01-3				

14. TRANSPORT INFORMATION

DOT	Regulated
Proper Shipping Name	Corrosive liquid, acidic, inorganic, n.o.s. (contains aluminum sulfate)
Hazard Class	8
UN-No	UN3264
Packing Group	PGIII
TDG	Regulated
Hazard Class	8

UN-No UN3264
Packing Group PGIII

15. REGULATORY INFORMATION

International Inventories

TSCA	Complies
DSL	Complies
NDSL	Complies
EINECS/ELINCS	Does not Comply
ENCS	Complies
CHINA	Complies
KECL	Does not Comply
PICCS	Complies
AICS	Complies

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization

Chronic Health Hazard	No
Acute Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

CERCLA

U.S. State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
aluminum sulfate	X	X	X		

Other International Regulations

Mexico - Grade No information available

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

E Corrosive material

D2B Toxic materials

**6. OTHER INFORMATION**

Prepared By Kaci Rosario, Product Safety Supervisor

Preparation Date August 14, 2008

Revision Date

Revision Summary Transfer to new Werco format

Disclaimer

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End of MSDS