

Gelman Sciences, Inc. d/b/a Pall Life Sciences 642 South Wagner Road Ann Arbor, MI 48103 734.436.4025 phone 734.436.4040 fax

CASE NARRATIVE

Monthly Data Pall Life Sciences Project: 1,4-Dioxane Remediation

Date: April, 2021

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Gelman Sciences, Inc. d/b/a Pall Life Sciences (PLS) attests to the validity of the laboratory data generated by PLS's Ann Arbor, Michigan Environmental Laboratory facilities reported herein. All analyses performed by PLS's Environmental Laboratory facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. PLS's Environmental group has reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

All 1,4-dioxane and bromate samples were analyzed by Pall Corporation's Environmental Laboratory. The test results in this report meet all NELAP requirements for parameters for which accreditation are required or available. Any exceptions to NELAP requirements are noted in this report. All exceptions are noted per laboratory standard operating procedure based on EPA Method 1624c. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results. The odd even rule is used for rounding. Holding times were met for all samples analyzed. Proper preservation was observed on all samples unless otherwise detailed in the individual sections below.

RECEIPT/ STORAGE

The samples were received on the days noted in the report for the Month; the samples arrived in good condition, properly preserved and on ice when necessary. Samples that require 1,4-dioxane analysis are collected in hydrochloric HCl acid-preserved vials to a pH of ≤2, except for the Pall ozone treatment samples. These samples have chemicals that, when mixed with the HCl acid, cause interferences and trap damage. Every attempt is made to analyze these samples within 24 hours of receipt.

Samples that require Bromate analysis are collected and preserved in the laboratory with ethylene di-amine and refrigerated.

The barium sample was taken as a composite sample, preserved with nitric acid, and refrigerated before and after being sent to Ann Arbor Technical Services (ATS) for analysis. This sample is preserved with nitric acid and refrigeration.

Samples that are delivered to the laboratory the same day as they are collected are likely not to have reached a fully chilled temperature. This is acceptable as long as there is evidence that chilling has begun. All samples are iced or refrigerated at 4°C (±2°C) from the time of collection until sample preparation or analysis.

1,4-Dioxane (GC-MS)

All ground water and treated water samples were analyzed for 1,4-Dioxane (GC-MS) in accordance with EPA 1624C, which has been modified to enhance detection limits. Samples that were diluted to bring them within the calibrated range of the instrument are noted with a "D" under the Qualifier Code section of the data report. Reporting limits were adjusted based on each dilution.

Reporting limit for undiluted samples is 1ppb (part per billion, micrograms per liter, $\mu g/L$). All quality control parameters were within the acceptance limits for reported samples unless indicated.

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Bromate (Ion Chromatography)

All surface water and treated samples were analyzed for Bromate (Ion Chromatography) in accordance with EPA 300.1. Surrogates are added to all samples. All quality control parameters were within the acceptance limits with the balance of sample analyzed.

The reporting limit for treated samples is 5.0ppb and for surface samples is 2.0ppb.

Barium

A composite Outfall001 sample was sent to Ann Arbor Technical Services (ATS) for total barium analysis in accordance with EPA 200.7. Barium samples are analyzed quarterly in compliance with PLS NPDES permit. This sample is preserved with nitric acid and refrigeration. The results were less than the permitted level of 440µg/L at 250µg/L.

Qualifiers

1,4-Dioxane Qualifier Codes:

Qualifier Code	Description
nd:	The compound was analyzed for, but not detected at or above the detection limit indicated.
D:	Analyte value quantified from a dilution, reporting limit is raised to reflect dilution.
E:	The compound result is greater than the upper quantitation limit in the associated calibration curve, reported as estimate.
В:	The sample vials contained air bubbles larger than 5mm, which may affect compound results.
J:	The compound was positively identified; the associated numerical value is the approximate concentration.
M:	Matrix effects, sample required dilution.
R:	The reported value is unusable and rejected due to variance from quality control criteria.
V:	The reported value is considered estimated due to variance from quality control criteria.
H:	Sample was analyzed past 14 day hold time, but within 45 days.
0:	Samples analyzed in outside laboratory.
S:	Samples split with DEQ.

Bromate Qualifier Codes:

Qualifier Code	Description
nd:	The compound was analyzed for, but was not detected at or above the detection limit indicated.
E:	The compound result is greater than the upper quantitation limit in the associated calibration curve.
J:	The compound was positively identified; the associated numerical value is the approximate concentration.
R:	The reported value is unusable and rejected due to variance from quality control criteria.
V:	The reported value is considered estimated due to variance from quality control criteria.
H:	Sample was analyzed past 28 day hold time
Manager: Susan	E.O. Peters Susan EDPURED Date: 05(10/2)
Analyst: Gage N	1. Trendel Date:
Report Checked	Date: 5/10/2)



Sample Analysis Report April, 2021

642 South Wagner Road Ann Arbor, MI 48103-9019 US 734.436.4025 phone

Analyst Initials: SEOP/GHT
Date: 05-10-20

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
Extraction Wells								
C3	-							
DOLPH-04-07-21-11:55-1	160	5.0						D
TW-20-04-07-21-11:57-1	1000	10.0						D
D2			7					
LB-4-04-02-21-12:00-1	560	10.0						D
LB-4-04-07-21-11:25-1	480	10.0						D
TW-21-04-07-21-11:40-1	300	10.0						D
E								
TW-18-04-07-21-11:45-1	250	10.0						D
TW-18-04-28-21-07:25-1	310	5.0	ā					D
TW-19-04-07-21-11:20-1	620	10.0						D
TW-23-04-09-21-14:30-1	440	10.0						D
Marshy								
PW-1-04-07-21-11:50-1	440	10.0						D
SW								
TW-22-04-07-21-12:00-1	520	10.0						D
TW-28-04-07-21-12:05-1	860	10.0				.6.		D
Monitoring Wells	•							
C3								

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)	
MW-105s-04-09-21-14:50-1	430	10.0						D	
D0	00								
A2 Cleaning Supply-04-07-21-11:15-1	43	10.0						D	
MW-53d-04-07-21-08:47-1	nd	1.0							
MW-53j-04-07-21-11:05-1	35	5.0						D	
MW-53s-04-07-21-09:55-1	nd	1.0							
D2									
2819 Dexter Rd-04-19-21-14:21-1	210	10.0					war turnt ich t	D	
456 Clarendon-04-27-21-13:14-1	600	10.0						D	
MW-107-04-19-21-13:05-1	690	10.0						D	
MW-113-04-14-21-14:21-1	140	5.0						D	
MW-117-04-28-21-14:25-1	nd	1.0							
MW-120s-04-14-21-09:54-1	nd	1.0							
MW-121s-04-15-21-10:15-1	nd	1.0							
MW-123s-04-20-21-13:33-1	nd	1.0							
MW-124s-04-28-21-10:04-1	nd	1.0							
MW-129i-04-13-21-10:58-1	nd	1.0							
MW-129s-04-13-21-09:38-1	nd	1.0							
MW-130i-04-20-21-12:18-1	6.6	1.0							
MW-130s-04-20-21-10:02-1	nd	1.0							
MW-134i-04-09-21-09:59-1	9.2	1.0							
MW-134s-04-09-21-11:06-1	11	1.0							
MW-54d-04-27-21-09:46-1	55	1.0							
MW-54s-04-27-21-08:39-1	nd	1.0							
MW-77-04-27-21-14:36-1	1200	10.0						D	
MW-92-04-19-21-11:48-1	88	5.0						D	
MW-94s-04-29-21-12:59-1	830	10.0						D	

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
MW-BE-1d-04-27-21-11:04-1	660	10.0						D
MW-BE-1s-04-27-21-12:14-1	690	10.0						D
Е								
MW-101-04-14-21-13:05-1	110	5.0						D
MW-103d-04-08-21-12:27-1	7.4	1.0			•			
MW-103s-04-08-21-13:36-1	110	1.0						
MW-104-04-13-21-13:28-1	28	1.0						
MW-105d-04-09-21-13:40-1	180	5.0						D
MW-106s-04-09-21-12:27-1	270	5.0						D
MW-108d-04-26-21-14:20-1	690	10.0						D
MW-108s-04-26-21-13:00-1	320	5.0						D
MW-110-04-13-21-14:44-1	120	5.0						D
MW-112d-04-08-21-09:57-1	1.3	1.0						
MW-112i-04-08-21-11:09-1	9.8	1.0						
MW-112s-04-08-21-08:47-1	1.7	1.0						
MW-119-04-14-21-11:33-1	33	1.0						
MW-120d-04-14-21-08:44-1	nd	1.0						
MW-121d-04-15-21-11:23-1	1.3	1.0						
MW-123d-04-20-21-14:42-1	nd	1.0						
MW-124d-04-28-21-08:55-1	nd	1.0						
MW-129d-04-13-21-12:08-1	2.1	1.0						
MW-130d-04-20-21-11:09-1	nd	1.0						
MW-134d-04-09-21-08:49-1	6.7	1.0						
MW-135-04-28-21-12:52-1	nd	1.0						
MW-71-04-29-21-14:33-1	730	10.0						D
MW-76i-04-07-21-12:39-1	100	5.0						D
MW-76s-04-07-21-13:50-1	300	10.0						D

MW-796-04-15-21-12-55-1 330 5.0 D MW-81-04-26-21-10-22-1 180 10.0 D MW-81-04-26-21-10-22-1 180 10.0 D MW-81-04-26-21-10-22-1 180 10.0 D MW-81-04-26-21-10-22-1 180 10.0 D MW-91-04-26-21-10-90-1 190 5.0 D MW-91-04-26-21-11-28-1 180 1.0 D MW-91-04-26-21-11-31-1 180 1.0 D MW-91-04-28-21-11-31-1 180 1.0 D MW-91-04-28-21-31-31-1 180 1.0 D M									
MW-79s-04-15-21-102-1 180 5.0 D MW-81-04-26-21-102-1 180 5.0 D MW-81-04-26-21-102-1 180 5.0 D MW-84s-04-08-21-14-55-1 220 5.0 D MW-84s-04-26-21-102-1 460 10.0 D MW-88-04-26-21-11-40-1 150 5.0 D MW-98-04-26-21-11-40-1 150 5.0 D MW-98-04-26-21-11-40-1 150 5.0 D MW-98-04-26-21-11-40-1 150 5.0 D MW-98-04-26-21-11-40-1 180 1.0 D MW-98-04-28-21-11-28-1 180 1.0 D MW-98-04-28-21-11-28-1 180 1.0 D MW-98-04-28-21-19-31-1 22 1.0 D MW-98-04-28-21-19-31-1 10 D MW-98-04-28-21-19-1 10 D MW-98-04-28-21-1 10 D MW-98-04-28-21-19-1 10 D MW-98-04-28-21-19-1 10 D MW	Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
MW-81-04-28-21-10:24-1	MW-79d-04-15-21-12:43-1	nd	1.0						
MW-646-04-08-21-14:55-1 220 5.0 D MW-85-04-28-21-10-22-1 460 10.0 D MW-85-04-28-21-11:40-1 150 5.0 D MW-85-04-28-21-11:40-1 150 5.0 D MW-95-04-28-21-11:28-1 150 10 D MW-96-04-28-21-11:28-1 150 10 D MW-96-04-28-21-11:28-1 150 10 D MW-96-04-28-21-11:38-1 150 10 D MW-96-04-28-21-11:38-1 150 10 D MW-96-04-28-21-11:38-1 150 10 D MW-96-04-28-21-11:38-1 150 D MW-96-04-28-21-10-03-1 150 D	MW-79s-04-15-21-13:55-1	330	5.0						D
MM-85-04-29-21-10-22-1	MW-81-04-26-21-10:24-1	180	5.0						D
MM-98-04-28-21-114-0-1 MM-99-04-28-21-09-06-1 MM-99-04-28-21-11-28-1 MM-98-04-28-21-11-28-1 MM-98-	MW-84s-04-08-21-14:55-1	220	5.0						D
MW-90-04-26-21-09:06-1 5.1 1.0	MW-85-04-29-21-10:22-1	460	10.0						D
MW-91-04-28-21-11:28-1 180 1.0	MW-88-04-26-21-11:40-1	150	5.0						D
MW-986-04-29-21-11:44-1 3.4 1.0	MW-90-04-26-21-09:06-1	5.1	1.0						
MW-98d-04-29-21-09/03-1 22 1.0	MW-91-04-28-21-11:28-1	180	1.0						
Surface Water Not Applicable HC/HR-04-01-21-08:50-1 nd 2.0 HC/HR-04-05-21-08:30-1 nd 2.0 HC/HR-04-05-21-08:30-1 nd 2.0 HC/HR-04-06-21-08:15-1 nd 2.0 HC/HR-04-06-21-11:10-1 nd 2.0 HC/HR-04-08-21-13:16-1 nd 2.0 HC/HR-04-09-21-10:05-1 nd 2.0 HC/HR-04-12-21-14:20-1 nd 2.0 HC/HR-04-13-21-09:45-1 nd 2.0 HC/HR-04-16-21-09:45-1 nd 2.0 HC/HR-04-16-21-08:15-1 nd 2.0 HC/HR-04-16-21-08:15-1 nd 2.0 HC/HR-04-18-21-08:00-1 nd 2.0 HC/HR-04-21-08:00-1 nd 2.0 HC/HR-04-20-21-07:50-1 nd 2.0	MW-94d-04-29-21-11:44-1	3.4	1.0						
Not Applicable HC/HR-04-01-21-08:50-1 HC/HR-04-02-21-07:55-1 HC/HR-04-05-21-08:30-1 HC/HR-04-05-21-08:15-1 HC/HR-04-07-21-11:10-1 HC/HR-04-07-21-11:10-1 HC/HR-04-08-21-13:15-1 HC/HR-04-09-21-10:05-1 HC/HR-04-19-21-10:05-1 HC/HR-04-19-21-10:05-1 HC/HR-04-18-21-09:45-1 HC/HR-04-18-21-09:45-1 HC/HR-04-18-21-09:45-1 HC/HR-04-18-21-09:45-1 HC/HR-04-18-21-09:45-1 HC/HR-04-18-21-09:45-1 HC/HR-04-18-21-09:45-1 HC/HR-04-18-21-09:00-1 HC/HR-04-18-21-08:15-1 HC/HR-04-18-21-08:00-1 HC/HR-04-18-21-08:15-1 HC/HR-04-18-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1	MW-98d-04-29-21-09:03-1	22	1.0						
HC/HR-04-01-21-08:50-1	Surface Water								
HC/HR-04-02-21-07:55-1 HC/HR-04-05-21-06:30-1 HC/HR-04-06-21-08:15-1 HC/HR-04-06-21-13:15-1 HC/HR-04-08-21-13:15-1 HC/HR-04-08-21-13:15-1 HC/HR-04-08-21-13:15-1 HC/HR-04-13-21-109:45-1 HC/HR-04-13-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-16-21-08:15-1 HC/HR-04-16-21-08:15-1 HC/HR-04-16-21-08:15-1 HC/HR-04-16-21-08:15-1 HC/HR-04-18-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-21-07:50-1	Not Applicable								
HC/HR-04-05-21-08:30-1 HC/HR-04-06-21-08:15-1 HC/HR-04-06-21-11:10-1 HC/HR-04-08-21-13:15-1 HC/HR-04-08-21-10:05-1 HC/HR-04-09-21-10:05-1 HC/HR-04-13-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-16-21-08:15-1 HC/HR-04-16-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-21-08:00-1	HC/HR-04-01-21-08:50-1			nd	2.0				
HC/HR-04-06-21-08:15-1 HC/HR-04-07-21-11:10-1 HC/HR-04-08-21-13:16-1 HC/HR-04-09-21-10:05-1 HC/HR-04-09-21-10:05-1 HC/HR-04-12-21-14:20-1 HC/HR-04-13-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-16-21-08:15-1 HC/HR-04-15-21-07:00-1 HC/HR-04-16-21-08:15-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-08:00-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1	HC/HR-04-02-21-07:55-1			nd	2.0				
HC/HR-04-07-21-11:10-1 HC/HR-04-08-21-13:15-1 HC/HR-04-09-21-10:05-1 HC/HR-04-12-21-14:20-1 HC/HR-04-13-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-15-21-07:00-1 HC/HR-04-16-21-08:15-1 HC/HR-04-19-21-08:00-1 HC/HR-04-19-21-07:50-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1	HC/HR-04-05-21-08:30-1			nd	2.0				
HC/HR-04-08-21-13:15-1	HC/HR-04-06-21-08:15-1			nd	2.0				
HC/HR-04-09-21-10:05-1 HC/HR-04-12-21-14:20-1 HC/HR-04-13-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-15-21-07:00-1 HC/HR-04-16-21-08:15-1 HC/HR-04-16-21-07:50-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1	HC/HR-04-07-21-11:10-1			nd	2.0				
HC/HR-04-12-21-14:20-1 HC/HR-04-13-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-15-21-07:00-1 HC/HR-04-16-21-08:15-1 HC/HR-04-19-21-08:00-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1	HC/HR-04-08-21-13:15-1			nd	2.0				
HC/HR-04-13-21-09:45-1 HC/HR-04-14-21-09:45-1 HC/HR-04-15-21-07:00-1 HC/HR-04-16-21-08:15-1 HC/HR-04-19-21-08:00-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1	HC/HR-04-09-21-10:05-1			nd	2.0				
HC/HR-04-14-21-09:45-1 HC/HR-04-15-21-07:00-1 HC/HR-04-16-21-08:15-1 HC/HR-04-19-21-08:00-1 HC/HR-04-20-21-07:50-1 Ind Description 1	HC/HR-04-12-21-14:20-1			nd	2.0				
HC/HR-04-15-21-07:00-1 HC/HR-04-16-21-08:15-1 HC/HR-04-19-21-08:00-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1 HC/HR-04-20-21-07:50-1	HC/HR-04-13-21-09:45-1			nd	2.0				
HC/HR-04-16-21-08:15-1 nd 2.0	HC/HR-04-14-21-09:45-1			nd	2.0				
HC/HR-04-19-21-08:00-1 nd 2.0	HC/HR-04-15-21-07:00-1			nd	2.0				
HC/HR-04-20-21-07:50-1 nd 2.0	HC/HR-04-16-21-08:15-1			nd	2.0				
	HC/HR-04-19-21-08:00-1			nd	2.0				
HC/HR-04-21-21-08:05-1 nd 2.0	HC/HR-04-20-21-07:50-1			nd	2.0				
	HC/HR-04-21-21-08:05-1			nd	2.0				

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
HC/HR-04-22-21-08:20-1			nd	2.0				
HC/HR-04-23-21-08:00-1			nd	2.0				
HC/HR-04-26-21-09:25-1			nd	2.0				
HC/HR-04-27-21-13:15-1			nd	2.0				
HC/HR-04-28-21-13:55-1			nd	2.0				
HC/HR-04-29-21-10:55-1			nd	2.0				
HC/HR-04-30-21-09:20-1			nd	2.0				
Treatment System								
OUTFALL-04-01-21-2			6.4	5.0				
OUTFALL-04-01-21-1	1.6	1.0						
OUTFALL-04-04-21-1	1.9	1.0						
OUTFALL-04-04-21-2			8.1	5.0				
OUTFALL-04-05-21-1	2.6	1.0						
OUTFALL-04-05-21-2			7.2	5.0				
OUTFALL-04-06-21-2			6.2	5.0				
OUTFALL-04-06-21-1	2.9	1.0						
OUTFALL-04-07-21-2			9.0	5.0				
OUTFALL-04-07-21-1	5.8	1.0						
OUTFALL-04-08-21-2			9.6	5.0				
OUTFALL-04-08-21-1	7.2	1.0						
OUTFALL-04-11-21-2			9.2	5.0				
OUTFALL-04-11-21-1	5.5	1.0						
OUTFALL-04-12-21-2			9.1	5.0				
OUTFALL-04-12-21-1	6.1	1.0						
OUTFALL-04-13-21-2			10	5.0				
OUTFALL-04-13-21-1	5.5	1.0						
OUTFALL-04-14-21-2			8.2	5.0				

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
OUTFALL-04-14-21-1	6.8	1.0						
OUTFALL-04-15-21-2			6.8	5.0				
OUTFALL-04-15-21-1	7.2	1.0						
OUTFALL-04-18-21-2			7.4	5.0				
OUTFALL-04-18-21-1	7.7	1.0						
OUTFALL-04-19-21-2			8.9	5.0				
OUTFALL-04-19-21-1	5.7	1.0						
OUTFALL-04-20-21-2			8.7	5.0				
OUTFALL-04-20-21-1	8.5	1.0						
OUTFALL-04-21-21-2			9.4	5.0				
OUTFALL-04-21-21-1	8.2	1.0						,
OUTFALL-04-22-21-2			9.2	5.0				
OUTFALL-04-22-21-1	9.5	1.0						
OUTFALL-04-25-21-2			9.2	5.0				
OUTFALL-04-25-21-1	9.6	1.0						
OUTFALL-04-26-21-2			8.5	5.0				
OUTFALL-04-26-21-1	9.7	1.0						
OUTFALL-04-27-21-2			8.7	5.0				
OUTFALL-04-27-21-1	7.3	1.0						
OUTFALL-04-28-21-2			9.0	5.0				
OUTFALL-04-28-21-1	6.0	1.0						
OUTFALL-04-29-21-2			7.0	5.0				
OUTFALL-04-29-21-1	6.1	1.0						
Red Pond-04-05-21-07:57-1	370	10.0						D
Red Pond-04-12-21-06:50-1	370	10.0						D
Red Pond-04-19-21-07:40-1	340	10.0						D
Red Pond-04-26-21-08:10-1	480	10.0						D

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
Red Pond-04-28-21-14:15-1	400	10.0						D



290 South Wagner Road Ann Arbor, Michigan 48103 Tel. 734/995-0995 Fax. 734/995-3731 Michigan Laboratory ID: 9504 Wisconsin Laboratory ID: 998321720

Data Transmittal Cover Page

Project Name:

Pall Corporation

ATS Project Number:

G001-002

ATS Report Number(s):

Inorg_SRF_040621

Client PO Number:

4503886817

Project Description:

This data report contains the results of one water sample, received by ATS on

4/6/21, to be analyzed for Barium.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient:	Ms. Sue Peters		Email: FAX Number:	Sue Peters@Pall.com
No. of Page	s (including cover pg.):	7		
From:	Sarah Stubblefield Senior Chemist / Lab Manager	Email: FAX Number:		d@AnnArborTechnicalServices.com
Additional M	Message:			8
Date	4/14/21	Signed:	34	H

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-995-0995.

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LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002

Report Date: 4/14/21

SRF / SDG Number(s): 0406211 Client PO Number: 4503886817

Case Narrative Summary

This case narrative applies to the following sample that was received at Ann Arbor Technical Services, Inc. (ATS) on 4/6/21, and associated matrix-specific QA/QC:

Samples

ampics							
Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix			
Received 4/6/21							
Outfall Composite	4/2/21 - 4/3/21	Standard	Barium	Water			

Upon receipt, samples were scheduled for the following analyses:

Analysis

• Total Barium (US EPA 200.7) (Standard Turn)

Number of Samples

• 1 + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Samples were preserved to a pH of <2 at the time of sample receipt. Sample condition and anomalies, if any, are presented in the "Sample Receipt" section of this report. All samples were prepared and analyzed within the holding times cited in the corresponding analytical methods with the following exceptions:

None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedures (SOPs) specific to the ATS Laboratory, as required by US EPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manuals.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DUP, DUP, LR).

G001-002.21/CN_0406211.doc

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA R5 EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Preparation

<u>Metals Analysis</u>: Samples were digested in accordance with US EPA method 200.7 (Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry).

Anomalies Noted:

None

Sample Analysis

Metals Analysis: Samples were analyzed in accordance with US EPA method 200.7 (Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry). An initial calibration with at least five levels was used to quantitate individual metals. Samples were reported to project specific reporting limits as mg/L.

Anomalies Noted:

None

Analytical QA/QC Summary

Calibration Verification

Method calibration was verified through the analysis of a mid-level initial calibration verification (CV) standard at a frequency of every ten samples. All verification standards met the acceptance criteria with the following exceptions:

None

Instrument Blanks

Low system background was demonstrated through the analysis of instrument blanks at a minimum of every ten samples. All instrument blanks met the acceptance criteria with the following exceptions:

• None

QA/QC Batch Summary

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed with the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:

• None



Laboratory Fortified Blanks / Laboratory Control Samples

A laboratory fortified blank (LFB) was analyzed as part of the QA/QC batch. The LFB met the acceptance criteria with the following exceptions:

None

Matrix Spikes and Spike Duplicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the acceptance criteria with the following exceptions:

None

Matrix Replicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The replicates met the acceptance criteria with the following exceptions:

None

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for barium.

None

/ April 14, 2021

Mark T. DeLong (Quality Assurance Coordinator)

/ April 14, 2021

Philip B. Simon (Laboratory Director)

Mark alexong





290 South Wagner Road Ann Arbor, Michigan 48103 Tel. 734/995-0995 Fax. 734/995-3731 Michigan Laboratory ID: 9604 Wisconsin Laboratory ID: 998321720

Inorganic Analysis Data Summary Sheet

For: Ms. Sue Peters

Pall Corporation 642 South Wagner Road Ann Arbor, MI 48103

ATS Project:

Pall Corporation

#G001-002

Report Date:

ATS SRF:

4/14/21 0406211

Sample Identification:

Outfall - Composite

Sample Date:

4/2/21 - 4/3/21

Sample Time:

na

Sampled By:

Sample Matrix:

Total Barium

Client 4/6/21

Laboratory Receipt Date:

Water

Analyzed **Analysis Analysis** Reporting Limit Time Ву Method Units Result Date Parameter Metals Analysis 4/6/21 13:10 DMS Metals Digestion EPA 200.7 Yes 4/8/21 DMS 0.001 12:46 EPA 200.7 0.25

mg/L

Comments

All methods reference USEPA methods unless otherwise noted. na - Indicates not available / not applicable.



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Quality Assurance / Quality Control Data Summary

QC Batch Number: QCINORG0406211	ATS Project: Pall Corporation	#G001-002
Parameter: Barium (US EPA 200.7)	Report Date: 4/14/21	

Results of QA Samples run concurrently with project samples

REPLICATE ANALYSIS

Sample	Replicate #1	Replicate #1 Replicate #2 Me						
#G001-002 Outfall - Composite 4/2/21 - 4/3/21 Matrix Spike	1.3 mg/L	1.3 mg/L	1.3 mg/L	2.5				

SPIKES and/or QC CHECK SAMPLES

Comple/Applyte	Known	Spike Concentration	Analyzed	Recovery (percent)		
Sample/Analyte	Concentration	Concentration	Concentration	(percent)		
#G001-002						
Laboratory Fortified Blank	<0.001 mg/L	1.0 mg/L	0.96 mg/L	95.7		
Outfall - Composite 4/2/21 - 4/3/21 Matrix Spike	0.25 mg/L	1.0 mg/L	1.3 mg/L	102.9		
Outfall - Composite 4/2/21 - 4/3/21 Matrix Spike Duplicate	0.25 mg/L	1.0 mg/L	1.3 mg/L	104.9		
	,					

BLANK ANALYSIS

Sample	Analyzed Concentration	QC Decision
#G001-002		
Laboratory Reagent Blank	<0.001 mg/L	Acceptable
W 1000		**
		1

Comments:		
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Calculations performed prior to rounding.

Control Limits:

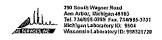
Recoveries

Laboratory Fortified Blank (85 - 115 %)

Matrix Spike (75 - 125 %)

Relative Range

Replicates (<20%)



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