

CASE NARRATIVE

Monthly Data Pall Life Sciences
Project: 1,4-Dioxane Remediation
Date: July 2017

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 instrumentation. 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.

A series of drinking water samples: 697 S. Wagner Road; 723 S. Wagner Road; 745 S. Wagner Road; 777 S. Wagner Road; and 5115 Jackson Road were sent to Ann Arbor Technical Services (ATS) for analysis. In addition one Outfall001 sample was sent to ATS for analysis.

The quarterly barium sample was sent to ATS for analysis. An Outfall composite sample was analyzed by EPA 200.7 for total Barium by ATS. The result was 210ppb with a reporting limit of 1ppb.

All other 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 at PLS 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 , with the exception of the PLS 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 then 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 ATS for analysis.

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 ($\pm 2^\circ\text{C}$) from the time of collection until sample preparation or analysis.

PLS 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, µg/L). All quality control parameters were within the acceptance limits.

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

Qualifiers

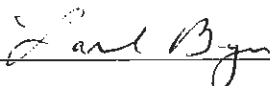
1,4-Dioxane Qualifier Codes:

<u>Qualifier Code</u>	<u>Description</u>
nd:	The compound was analyzed for, but was 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.
B:	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 28 days.
O:	Samples analyzed in outside laboratory.
S:	Samples split with DEQ.

Bromate Qualifier Codes:

<u>Qualifier Code</u>	<u>Description</u>
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
O:	Samples analyzed in outside laboratory.

Analyst: Susan E.O. Peters Date: _____

Report Checked by: Laurel Beyer  Date: 8/4/17

Sample Analysis Report

July, 2017

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

Analyst Initials: SOP
Date: 08-04-17

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)
Residential Wells								
D0								
5115 Jackson Rd-07-12-17-15:05-1	nd	1.0					ATS	O
Miscellaneous Wells								
ARTESIAN #3-07-12-17-15:20-1	11	1.0						
Residential Wells								
Not Determined								
697 South Wagner Rd-07-12-17-13:49-1	nd	1.0					ATS	O
723 S. Wagner Road-07-12-17-13:42-1	nd	1.0					ATS	O
745 S. Wagner Road-07-12-17-13:34-1	nd	1.0					ATS	O
777 S. Wagner Road-07-12-17-13:27-1	nd	1.0					ATS	O
Extraction Wells								
C3								
DOLPH-07-10-17-08:40-1	110	5.0						D
TW-20-07-10-17-08:10-1	900	10.0						D
D2								
LB-1-07-26-17-09:07-1	400	10.0						D
LB-4-07-11-17-08:10-1	480	10.0						D
TW-21-07-11-17-09:04-1	190	10.0						D
E								

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)
TW-18-07-10-17-08:00-1	280	5.0						D
TW-19-07-11-17-11:03-1	720	10.0						D
TW-23-07-11-17-11:05-1	470	10.0						D
SW								
TW-22-07-10-17-08:30-1	440	10.0						D
TW-8-07-10-17-08:31-1	700	25.0						D
Monitoring Wells								
C3								
MW-22-07-13-17-13:49-1	290	10.0						D
MW-23-07-25-17-11:01-1	110	1.0						
MW-24-07-26-17-13:51-1	660	10.0						D
MW-25d-07-13-17-11:24-1	130	1.0						
MW-2d-07-13-17-14:30-1	40	1.0						
MW-39s-07-26-17-15:27-1	1.7	1.0						
D0								
110 Parkland Plaza-07-26-17-10:40-1	1.6	1.0						
4141 Jackson Rd-07-26-17-10:00-1	3.0	1.0						
4401 Park West-07-25-17-14:21-1	6.4	1.0						
4742 Park Rd-07-25-17-15:39-1	6.3	1.0						
A2 Cleaning Supply-07-12-17-16:27-1	82	1.0						
MW-31-07-27-17-11:50-1	11	1.0						
MW-40d-07-25-17-12:10-1	nd	1.0						
MW-40s-07-25-17-12:40-1	nd	1.0						
MW-42d-07-27-17-10:27-1	nd	1.0						
MW-42s-07-27-17-11:03-1	nd	1.0						
MW-53d-07-14-17-12:23-1	nd	1.0						

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)
MW-53i-07-14-17-13:23-1	48	1.0						
MW-53s-07-14-17-12:53-1	nd	1.0						
MW-59s-07-18-17-11:33-1	nd	1.0						
MW-60-07-25-17-13:34-1	3.0	1.0						
D2								
170 Aprill-07-26-17-12:12-1	6.6	1.0						
MW-120s-07-14-17-11:40-1	nd	1.0						
MW-121s-07-13-17-14:47-1	nd	1.0						
MW-123s-07-14-17-10:28-1	nd	1.0						
MW-124s-07-12-17-15:45-1	nd	1.0						
MW-126s-07-18-17-12:48-1	nd	1.0						
MW-129i-07-13-17-12:43-1	nd	1.0						
MW-129s-07-13-17-14:00-1	nd	1.0						
MW-130i-07-13-17-10:53-1	4.0	1.0						
MW-130s-07-13-17-11:23-1	nd	1.0						
MW-131s-07-18-17-09:55-1	nd	1.0						
MW-133i-07-26-17-13:10-1	1.7	1.0						
MW-133s-07-26-17-13:33-1	1.9	1.0						
MW-134i-07-18-17-14:39-1	8.6	1.0						
MW-134s-07-21-17-12:35-1	9.9	1.0						
MW-39d-07-26-17-16:07-1	50	1.0						
E								
MW-103d-07-24-17-13:21-1	8.7	1.0						
MW-103s-07-24-17-14:02-1	53	1.0						
MW-112d-07-24-17-09:37-1	nd	1.0						
MW-112i-07-24-17-11:13-1	9.6	1.0						
MW-112s-07-24-17-10:23-1	nd	1.0						

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)
MW-121d-07-13-17-15:22-1	1.6	1.0						
MW-124d-07-12-17-14:46-1	nd	1.0						
MW-126d-07-18-17-12:21-1	nd	1.0						
MW-129d-07-13-17-13:13-1	1.2	1.0						
MW-131d-07-18-17-09:15-1	nd	1.0						
MW-133d-07-26-17-14:13-1	3.3	1.0						
MW-134d-07-18-17-14:13-1	5.6	1.0						
MW-135-07-13-17-09:50-1	nd	1.0						
MW-59d-07-18-17-10:51-1	nd	1.0						
MW-76i-07-25-17-10:00-1	110	1.0						
MW-76s-07-25-17-10:32-1	280	5.0						D
MW-82s-07-24-17-15:05-1	370	10.0						D
MW-84s-07-25-17-11:15-1	21	10.0						D
MW-97d-07-12-17-09:30-1	nd	1.0						
MW-97s-07-12-17-08:35-1	nd	1.0						
MW-98s-07-24-17-12:27-1	1.6	1.0						
MW-99d-07-12-17-10:59-1	nd	1.0						
MW-99s-07-12-17-11:37-1	nd	1.0						
Marshy								
AMW-1-07-26-17-11:04-1	300	10.0						D
AMW-2-07-25-17-11:14-1	84	2.0						D
MOW-1-07-25-17-11:29-1	440	10.0						D
NMW-1d-07-26-17-11:31-1	650	5.0						D
NMW-1s-07-26-17-11:21-1	1500	1.0						D
NMW-2d-07-26-17-12:06-1	780	10.0						D
NMW-2s-07-26-17-11:55-1	2200	50.0						D
NMW-3d-07-26-17-14:15-1	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)
NMW-3s-07-26-17-14:08-1	410	5.0						D
PMW-1-07-25-17-16:46-1	160	2.0						D
PMW-2-07-25-17-16:31-1	4300	50.0						D
PMW-3-07-25-17-11:47-1	6000	100.0						D
PMW-4-07-25-17-16:13-1	1000	1.0						D
SH								
MW-25s-07-13-17-11:15-1	130	1.0						
MW-2s-07-13-17-14:12-1	2.4	1.0						
MW-5d-07-13-17-15:15-1	10000	100.0						D
SW								
MW-57-07-13-17-14:54-1	2.6	1.0						
Surface Water								
Not Applicable								
HC/HR-07-05-17-07:45-1				nd	2.0			
HC/HR-07-06-17-07:10-1				nd	2.0			
HC/HR-07-07-17-08:00-1				nd	2.0			
HC/HR-07-10-17-08:12-1				nd	2.0			
HC/HR-07-11-17-07:55-1				nd	2.0			
HC/HR-07-12-17-08:33-1				nd	2.0			
HC/HR-07-13-17-08:40-1				nd	2.0			
HC/HR-07-14-17-09:45-1				nd	2.0			
HC/HR-07-17-17-07:15-1				nd	2.0			
HC/HR-07-18-17-07:50-1				nd	2.0			
HC/HR-07-19-17-11:05-1				nd	2.0			
HC/HR-07-20-17-13:00-1				nd	2.0			
HC/HR-07-21-17-08:30-1				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-07-24-17-08:33-1			nd	2.0				
HC/HR-07-25-17-08:32-1			nd	2.0				
HC/HR-07-26-17-08:21-1			nd	2.0				
HC/HR-07-27-17-08:56-1			nd	2.0				
HC/HR-07-28-17-08:12-1			nd	2.0				
HC/HR-07-31-17-09:16-01			nd	2.0				

Treatment System

OUTFALL-07-02-17-2			nd	5.0				
OUTFALL-07-02-17-1	6.9	1.0						
OUTFALL-07-03-17-2			5.9	5.0				
OUTFALL-07-03-17-1	6.3	1.0						
OUTFALL-07-04-17-2			5.8	5.0				
OUTFALL-07-04-17-1	6.5	1.0						
OUTFALL-07-05-17-1	6.4	1.0						
OUTFALL-07-05-17-2			6.8	5.0				
OUTFALL-07-06-17-2			6.8	5.0			ATS	
OUTFALL-07-06-17-1	6	1.0					ATS	O, H
OUTFALL-07-09-17-1	6.6	1.0						
OUTFALL-07-09-17-2			7.4	5.0				
OUTFALL-07-10-17-1	6.2	1.0						
OUTFALL-07-10-17-2			5.3	5.0				
OUTFALL-07-11-17-1	6.0	1.0						
OUTFALL-07-11-17-2			6.9	5.0				
OUTFALL-07-12-17-1	6.5	1.0						
OUTFALL-07-12-17-2			5.6	5.0				
OUTFALL-07-13-17-1	6.6	1.0						
OUTFALL-07-13-17-2			5.5	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-07-16-17-1	6.4	1.0						
OUTFALL-07-16-17-2			6.4	5.0				
OUTFALL-07-17-17-1	7.0	1.0						
OUTFALL-07-17-17-2			6.1	5.0				
OUTFALL-07-18-17-1	6.5	1.0						
OUTFALL-07-18-17-2			6.0	5.0				
OUTFALL-07-19-17-1	6.4	1.0						
OUTFALL-07-19-17-2			nd	5.0				
OUTFALL-07-20-17-1	6.1	1.0						
OUTFALL-07-20-17-2			6.4	5.0				
OUTFALL-07-23-17-2			6.6	5.0				
OUTFALL-07-23-17-1	6.2	1.0						
OUTFALL-07-24-17-2			6.2	5.0				
OUTFALL-07-24-17-1	6.2	1.0						
OUTFALL-07-25-17-1	6.2	1.0						
OUTFALL-07-25-17-2			7.2	5.0				
OUTFALL-07-26-17-1	6.4	1.0						
OUTFALL-07-26-17-2			7.3	5.0				
OUTFALL-07-27-17-1	6.2	1.0						
OUTFALL-07-27-17-2			8.0	5.0				
OUTFALL-07-30-17-01	5.8	1.0						
OUTFALL-07-30-17-02			7.8	5.0				
OUTFALL-07-31-17-1	5.9	1.0						
OUTFALL-07-31-17-2			7.1	5.0				
Red Pond-07-05-17-07:30-1	410	10.0						D
Red Pond-07-10-17-07:55-1	370	10.0						D
Red Pond-07-17-17-06:50-1	390	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-07-24-17-10:00-1	380	10.0						D
Red Pond-07-31-17-08:46-1	390	10.0						D

PLS Qualifier Codes:

- nd: The compound was analyzed for, but was not detected at or above the detection limit indicated.
- D: Analyte value quantified from a dilution, reporting limit is raised to reflect dilution.
- H: Sample was analyzed past 14 day hold time, but within 28 days used by ATS for same method with EPA approval.
- O: Samples analyzed in outside laboratory.



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

Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): SRF_0725171

Project Description: This data report contains the results of seven water samples, received by ATS on 7/25/17, to be analyzed for 1,4-Dioxane or Barium.

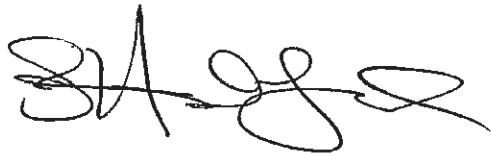
We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. 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:** Sue_Peters@Pall.com
FAX Number: _____

No. of Pages (including cover pg.): 18

From: Sarah Stubblefield **Email:** Sarah.Stubblefield@AnnArborTechnicalServices.com
Senior Chemist / Lab Manager **FAX Number:** 734-995-3731

Additional Message: Email Copy: Ms. Laurel Beyer (Laurel_Beyer@Pall.com)



Date: 8/1/17 **Signed:** _____

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LABORATORY OPERATIONS SAMPLE DELIVERY GROUP (SDG) CASE NARRATIVE

ATS Project Number: G001-002

ATS SRF's: 0725171

SDG Summary

This case narrative applies to the following seven samples that were received by Ann Arbor Technical Services, Inc. (ATS) on 7/25/17, and associated matrix-specific QA/QC:

Samples

Client Sample Identification	Laboratory Sample ID	Analysis	Matrix
Received 7/25/17			
Outfall 001 7/14/17	Same	Barium	Water
697 South Wagner Road 7/12/17	Same	1,4-Dioxane	Water
723 South Wagner Road 7/12/17	Same	1,4-Dioxane	Water
745 South Wagner Road 7/12/17	Same	1,4-Dioxane	Water
777 South Wagner Road 7/12/17	Same	1,4-Dioxane	Water
5115 Jackson Road 7/12/17	Same	1,4-Dioxane	Water
Outfall 7/6/17	Same	1,4-Dioxane	Water

Matrix Specific QC

Client Sample Identification	Laboratory Sample ID	Analysis	Matrix
Outfall 001 7/14/17 Matrix Spike	Same	Barium	Water
Outfall 001 7/14/17 Laboratory Duplicate	Same	Barium	Water

Upon receipt, samples were scheduled for the following analyses:

- 1,4-Dioxane by EPA method 1624 (select samples)
- Barium by EPA method 200.7 (select samples)

Sample Receipt and Chain of Custody Records

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies are presented in the "Chain of Custody and Sample Receipt Documentation" section of this report.

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 procedure (SOP) specific to the ATS Laboratory, as required by USEPA. 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).

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 Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed in accordance with EPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits.

Metals Analysis: Samples were analyzed in accordance with USEPA 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.

Anomalies Noted:

- None

Analytical QA/QC Summary

Calibration Verification

Method calibration was verified through the running of a mid-level initial calibration verification (CV) standard at a frequency of every 12 hours (GC/MS) or every ten samples (ICP/AES). All verification standards met the acceptance criteria with the following exceptions:

- None

Instrument Blanks

Instrument blanks were analyzed at a frequency of every 12 hours (GC/MS) or every ten samples (ICP/AES). All 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 each QA/QC batch. The LRB's met the acceptance criteria with the following exceptions:

- None

Laboratory Fortified Blanks and Matrix Spikes *(Applicable to all analyses)*

A laboratory fortified blank (LFB) / laboratory control sample (LCS) was analyzed with each QA/QC batch. The LCS/LFB's met the acceptance criteria with the following exceptions:

- None

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

- None

Matrix Duplicates

A replicate analysis was analyzed with each QA/QC batch. All 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:

- None



/ August 1, 2017

Mark T. DeLong (Quality Assurance Coordinator)



/ August 1, 2017

Philip B. Simon (Laboratory Director)



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: 8/1/17
ATS SRF: 0725171

Sample Identification: Outfall 001

Sample Date: 7/14/17
Sample Time: na
Sampled By: Client
Laboratory Receipt Date: 7/25/17
Sample Matrix: Treated Groundwater

<u>Parameter</u>	<u>Method</u>	<u>Units</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Analysis Date</u>	<u>Analysis Time</u>	<u>Analyzed By</u>
Metals Analysis							
Total Barium	EPA 200.7	mg/L	0.21	0.001	8/1/17	8:42	SLS

Comments

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



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

Organic 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: 8/1/17
ATS SRF: 0725171

Sample Identification: 697 South Wagner Road

Sample Date: 7/12/17
Sample Time: 1:49 PM
Sampled By: Client
Laboratory Receipt Date: 7/25/17
Sample Matrix: Drinking Water

<u>Parameter</u>	<u>Method</u>	<u>Units</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Analysis Date</u>	<u>Analysis Time</u>	<u>Analyzed By</u>
Organic Analysis							
1,4-Dioxane	EPA 1624	mg/L	<0.001	0.001	7/26/17	15:22	JEB

Comments

All methods reference USEPA methods unless otherwise noted.



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

Organic 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: 8/1/17
ATS SRF: 0725171

Sample Identification: 723 South Wagner Road

Sample Date: 7/12/17
Sample Time: 1:42 PM
Sampled By: Client
Laboratory Receipt Date: 7/25/17
Sample Matrix: Drinking Water

<u>Parameter</u>	<u>Method</u>	<u>Units</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Analysis Date</u>	<u>Analysis Time</u>	<u>Analyzed By</u>
Organic Analysis							
1,4-Dioxane	EPA 1624	mg/L	<0.001	0.001	7/26/17	16:04	JEB

Comments

All methods reference USEPA methods unless otherwise noted.



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

Organic 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: 8/1/17
ATS SRF: 0725171

Sample Identification: 745 South Wagner Road

Sample Date: 7/12/17
Sample Time: 1:34 PM
Sampled By: Client
Laboratory Receipt Date: 7/25/17
Sample Matrix: Drinking Water

<u>Parameter</u>	<u>Method</u>	<u>Units</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Analysis Date</u>	<u>Analysis Time</u>	<u>Analyzed By</u>
Organic Analysis							
1,4-Dioxane	EPA 1624	mg/L	<0.001	0.001	7/26/17	16:46	JEB

Comments

All methods reference USEPA methods unless otherwise noted.



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

Organic 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: 8/1/17
ATS SRF: 0725171

Sample Identification: 777 South Wagner Road

Sample Date: 7/12/17
Sample Time: 1:27 PM
Sampled By: Client
Laboratory Receipt Date: 7/25/17
Sample Matrix: Drinking Water

<u>Parameter</u>	<u>Method</u>	<u>Units</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Analysis Date</u>	<u>Analysis Time</u>	<u>Analyzed By</u>
Organic Analysis							
1,4-Dioxane	EPA 1624	mg/L	<0.001	0.001	7/26/17	17:28	JEB

Comments

All methods reference USEPA methods unless otherwise noted.



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

Organic 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: 8/1/17
 ATS SRF: 0725171

Sample Identification: 5115 Jackson Road

Sample Date: 7/12/17
 Sample Time: 3:05 PM
 Sampled By: Client
 Laboratory Receipt Date: 7/25/17
 Sample Matrix: Drinking Water

Parameter	Method	Units	Result	Reporting Limit	Analysis Date	Analysis Time	Analyzed By
Organic Analysis							
1,4-Dioxane	EPA 1624	mg/L	<0.001	0.001	7/26/17	18:10	JEB

Comments

All methods reference USEPA methods unless otherwise noted.



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

Organic 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: 8/1/17
ATS SRF: 0725171

Sample Identification: Outfall

Sample Date: 7/6/17
Sample Time: na
Sampled By: Client
Laboratory Receipt Date: 7/25/17
Sample Matrix: Treated Groundwater

<u>Parameter</u>	<u>Method</u>	<u>Units</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Analysis Date</u>	<u>Analysis Time</u>	<u>Analyzed By</u>
Organic Analysis 1,4-Dioxane	EPA 1624	mg/L	0.006	0.001	7/26/17	18:52	JEB

Comments

All methods reference USEPA methods unless otherwise noted.



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

Quality Assurance Data Summary

QC Batch Number: QCINORG0726171-G

ATS Project: Pall Corporation #G001-002

Method Number: EPA 1624

Report Date: 8/1/17

Results of QA Samples run concurrently with project samples

Spike and/or QC Check Samples

Sample	Known Concentration	Spiked Concentration	Analyzed Concentration	Percent Recovery
#G001-002, #Z999-001 Laboratory Fortified Blank 7/26/17 1,4-Dioxane	<0.001 mg/L	0.010 mg/L	0.009 mg/L	93.6
#Z999-001 Barton Shore 7/24/17 Matrix Spike 1,4-Dioxane	<0.001 mg/L	0.010 mg/L	0.011 mg/L	109.6
Barton Shore 7/24/17 Matrix Spike Duplicate 1,4-Dioxane	<0.001 mg/L	0.010 mg/L	0.011 mg/L	106.8

Comments:

Calculations were performed prior to rounding.

Limits

Laboratory Control Sample Recovery (85 - 115%)
 Matrix Spike Recovery (80 - 120%)



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Tel. 734/995-0995 Fax. 734/995-3731
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Quality Assurance Data Summary

QC Batch Number: QCINORG0726171-G

ATS Project: Pall Corporation #G001-002

Method Number: EPA 1624

Report Date: 8/1/17

Results of QA Samples run concurrently with project samples

Replicate Analysis

Sample	Replicate #1	Replicate #2	Mean	Relative Range (percent)
#Z999-001 Barton Shore 7/24/17 Matrix Spike 1,4-Dioxane	0.011 mg/L	0.011 mg/L	0.011 mg/L	2.6

Comments:

Limits

Calculations were performed prior to rounding.

Relative Range (< 30%)



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Quality Assurance Data Summary

QC Batch Number: QCINORG0726171-G

ATS Project: Pall Corporation #G001-002

Method Number: EPA 1624

Report Date: 8/1/17

Results of QA Samples run concurrently with project samples

Blank Analysis

Sample	Analyzed Concentration	QC Decision
#G001-002, #Z999-001 Laboratory Reagent Blank 7/26/17 1,4-Dioxane	<0.001 mg/L	Acceptable

Comments: _____



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

Quality Assurance Data Summary

QC Batch Number: QCINORG0801171-G

ATS Project: Pall Corporation #G001-002

Method Number: EPA 200.7

Report Date: 8/1/17

Results of QA Samples run concurrently with project samples

Spike and/or QC Check Samples

Sample	Known Concentration	Spiked Concentration	Analyzed Concentration	Percent Recovery
#G001-002 Laboratory Fortified Blank 8/1/17 Barium	<0.001 mg/L	0.16 mg/L	0.16 mg/L	98.4
Outfall 7/14/17 Matrix Spike Barium	0.21 mg/L	2.0 mg/L	2.3 mg/L	105.4

Comments:

Calculations were performed prior to rounding.

Limits

Laboratory Control Sample Recovery (85 - 115%)

Matrix Spike Recovery (75 - 125%)



290 South Wagner Road
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Quality Assurance Data Summary

QC Batch Number: QCINORG0801171-G

ATS Project: Pall Corporation #G001-002

Method Number: EPA 200.7

Report Date: 8/1/17

Results of QA Samples run concurrently with project samples

Replicate Analysis

Sample	Replicate #1	Replicate #2	Mean	Relative Range (percent)
#G001-002 Outfall 7/14/17 Barium	0.22 mg/L	0.21 mg/L	0.21 mg/L	2.5

Comments:

Calculations were performed prior to rounding.

Limits

Relative Range (< 20%)



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Quality Assurance Data Summary

QC Batch Number: QCINORG0801171-G

ATS Project: Pall Corporation #G001-002

Method Number: EPA 200.7

Report Date: 8/1/17

Results of QA Samples run concurrently with project samples

Blank Analysis

Sample	Analyzed Concentration	QC Decision
#G001-002 Laboratory Reagent Blank 8/1/17 Barium	<0.001 mg/L	Acceptable

Comments: _____



290 South Wagner Road
Ann Arbor, MI 48103
Tel 734/995-0995
Fax 734/995-3731

CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME				NO. OF CONTAINERS	SAMPLE TYPE										REMARKS - INDICATE SOIL / WATER / AIR / SEDIMENT / SLUDGE						
ADDRESS:		STATION LOCATION					Total Barium	1,1-Dioxane	1,1,1-TCE	1,1,2-TCE	1,1-DCE	1,2-DCE	1,1,1-THC	1,1,2-THC	1,1,2,2-TCA	1,1,1,2-TCDF		1,2,3,4-TCDF	1,2,3,4-TCDF	1,2,3,4-TCDF	1,2,3,4-TCDF	1,2,3,4-TCDF	1,2,3,4-TCDF
642 S. Wagner Rd, Ann Arbor, Mi.		Drinking water + Barium																					
EMAIL: sue.peters@pall.com		SAMPLER (SIGNATURE) Keith Patterson; Robert Ursillo																					
STA NO.	DATE	TIME	COMP	GRAB	STATION LOCATION																		
	7-14-17	N/A	✓		Outfall 001 (HCL)	1	✓															Treated Groundwater	
	7-12-17	13:49		✓	697 S. Wagner Rd (HCL)	2		✓														Drinking Water	
	7-12-17	13:42		✓	723 S. Wagner Rd (HCL)	2		✓														Drinking Water	
	07-02-17	10:34		✓	745 S. Wagner Rd (HCL)	2		✓														Drinking Water	
	7-12-17	13:27		✓	777 S. Wagner Rd (HCL)	2		✓														Drinking Water	
	7-12-17	15:05		✓	511 S Jackson Rd. (HCL)	2		✓														Drinking Water	
	07-06-17	N/A	✓		Outfall 4	2		✓														Treated Groundwater	
RELINQUISHED BY: (SIGNATURE) Sue Peters		DATE/TIME 7-25-17 16:04		RECEIVED BY: (SIGNATURE) 		RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE)		DATE/TIME		REMARKS									
RELINQUISHED BY: (SIGNATURE)		DATE/TIME		RECEIVED BY: (SIGNATURE) FOR DISPOSAL <input type="checkbox"/>		DATE/TIME		REMARKS															