This document is made available electronically by the Minnesota Legislative Reference Library as part of an ongoing digital archiving project. https://www.lrl.mn.gov

FY2021 Investigation Summary

Vadnais Heights Landfill
MPCA Site ID: SW #27
Vadnais Heights, Minnesota

Prepared for:

Minnesota Pollution Control Agency

Mr. Andrew Eddy
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155

Prepared by:

Bay West
Customer-Focused Environmental & Industrial Solutions

Bay West LLC
5 Empire Drive
St. Paul, Minnesota 55103

June 2021

Bay West Job # J200402

Report Author:	Erik Nimlos	Title:	Project Manager
Signature:		Date:	6/30/2021
Report Reviewer:	Rick Van Allen, PG	Title:	Senior Project Manager
Signature:		Date:	6/28/2021

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 BACKGROUND INFORMATION 1
3.0 SCOPE OF WORK 2
3.1 Administrative Tasks 2
3.2 Soil and Groundwater Investigation 2
3.3 Vapor Intrusion Assessment 3
4.0 FIELD WORK RESULTS 4
4.1 Soil Conditions 4
4.2 Monitoring Well Installation 4
4.3 Permanent Soil Gas Point Installation 5
4.4 Landfill Gas Monitoring Results 5
5.0 ANALYTICAL RESULTS 5
5.1 Soil 5
5.1.1 DRO 5
5.1.2 Dioxins/Furans 5
5.1.3 PFAS 6
5.2 Groundwater 6
5.2.1 DRO 6
5.2.2 1,4-Dioxane 6
5.2.3 Dioxins 6
5.2.4 PFAS 6
5.2.5 Nitrate and Nitrite 7
5.2.6 Gross Alpha 7
5.3 Soil Gas 7
5.3.1 VOCs 7
5.3.2 Methane 7
6.0 CONCLUSIONS AND RECOMMENDATIONS 7
6.1 Soil 7
6.2 Groundwater 8
6.3 Soil Gas 8

List of Figures

Figure 1 Site Location Map
Figure 2 Sampling Locations
Figure 3 Cross Section Location Map
Figure 4A Cross Section A-A'
Figure 4B Cross Section B-B'
Figure 5 Soil Results Summary
Figure 6 Groundwater Results Summary
Figure 7A Groundwater Contours (October 2020)
Figure 7B Groundwater Contours (February 2021)
Figure 7C Groundwater Contours (May 2021)

List of Tables

Table 1 Soil Headspace Results
Table 2 Groundwater Elevations
Table 3 Soil Analytical Results
Table 4 Groundwater Analytical Results
Table 5 Soil Gas Analytical Results
Table 6 Quarterly Landfill Gas Monitoring Results

List of Appendices

Appendix A – Investigation-Derived Wastes
Appendix B – 2021 Sampling and Construction Logs
Appendix C – 2021 Laboratory Analytical Reports

1.0 INTRODUCTION

This report summarizes the results of the FY2021 fieldwork performed at the Vadnais Heights Landfill (the Site) located at 655 County Road F East, Vadnais Heights, Minnesota. A site location map is included as **Figure 1**. This report summarizes Bay West's data collection activities and presents our recommendations regarding the risks posed to surrounding receptors by contamination remaining at the Site. The fieldwork was performed in accordance with our work plan dated August 22, 2020, and through subsequent consultation with the MPCA.

A summary of background information is provided in **Section 2.0**. The scope of work is summarized in **Section 3.0**. Results from the fieldwork screening activities are included in **Section 4.0**. **Section 5.0** contains a summary of the laboratory analytical detections for soil, groundwater, and soil gas. **Section 6.0** presents Bay West's conclusions and recommendations regarding the Site. Sampling locations are depicted on **Figure 2**. Maps showing soil boring / monitoring well cross sections are included as **Figures 3**, **4A**, and **4B**. Maps depicting soil and groundwater data are included as **Figure 5** and **Figure 6**, respectively. Groundwater elevation contour maps from the October 2020, February 2021, and May 2021 sampling events are included on **Figures 7A** through **7C**, respectively.

2.0 BACKGROUND INFORMATION

During FY2020, Bay West revisited historical sources to better determine the nature and extent of the landfill. Review of the available records provided by city, county, and state sources did not reveal any significant new discoveries related to historical waste disposal at the Site. Since no additional significant insights were made regarding waste type and distribution at the Site and based on the availability of historical records and their inherent limited quality, Bay West did not recommend further landfill waste research.

Results of the FY2020 field investigations lead to the following findings:

- In soil samples, benzo(a)pyrene (BaP) and its equivalents, arsenic, diesel-range organics (DRO), 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD) equivalents, and polychlorinated biphenyls (PCBs) exceeded their respective screening criteria in one or more soil samples. Arsenic and PCB impacts were limited to the top four feet of the soil borings while BaP impacts occurred in both the surface interval (0–2 ft bgs) and the 8–10 ft bgs interval. Dioxin impacts occurred in the 8-10 ft bgs interval. DRO impacts to soil were detected as shallow as 2 feet below grade and as deep as 10 feet below grade at the Site.

- In groundwater, gross alpha, perfluorooctanoic acid (PFOA), and DRO exceeded their respective screening criteria at one or more groundwater sampling locations. Based on Site groundwater contours for March and May 2020, groundwater appeared to be traveling to the southwest, toward largely vacant land south of County Road F East. Based on the previously conducted groundwater risk assessment, the identified groundwater impacts did not appear to pose a risk to surrounding water supply wells. However, impacts to groundwater did not appear to be fully delineated at the time.

- In soil gas, sampling results from PSG05 and PSG06 along with historical data indicated that the methane plume had been delineated to the west, north, and east of the Site. Indoor landfill gas monitoring results indicate that the methane soil gas plume appeared stable in the vicinity of the on-Site buildings (event/city center, warming house and concession building). In March 2020, PCE was detected in the sample collected from PSG05, located approximately 65 feet off the southeast corner of the event/city center building at concentrations greater than the Residential and Industrial ISVs but less than

the 33x ISVs. No other VOCs were detected at concentrations above their respective Industrial or Residential 33x ISVs in the remaining PSG sample location (PSG06).

Based on the FY2020 results, for FY2021 Bay West recommended installation of additional sampling locations to further delineate impacts to soil, groundwater, and soil vapor. Bay West also recommended targeted analysis for only contaminants with historical detections above action levels to expedite delineation of potential offsite contaminant migration. The FY2021 scope of work and any deviations are discussed in the following section.

3.0 SCOPE OF WORK

The FY2021 scope of services and deviations from the work plan are summarized below.

3.1 Administrative Tasks

Bay West completed the following project coordination and administrative tasks:

- Prepared a project-specific Site Safety and Health Plan (SSHP). The SSHP governed all project field activities authorized by the MPCA.
- Conducted project coordination and communication with the MPCA and surrounding property owners for properties where soil, groundwater, permanent soil gas (PSG) probes, and sub-slab sampling were to be performed.
- Executed state and non-state contract order forms for drilling, analytical services, waste disposal, and disposable sampling equipment.

3.2 Soil and Groundwater Investigation

Bay West performed the following soil and groundwater investigation activities:

Administration

Marked proposed drilling locations as approved by MPCA and the City of Vadnais Heights, as required by Gopher State One Call.

Soil Investigation

Advanced seven (7) soil borings at off-site locations.

- Advanced three (3) soil borings in the vicinity of SW27-SB06 located along the perimeter of the Site where elevated detections of diesel-range organics (DRO) were documented in soil during FY2020 investigation activities.
- Advanced four (4) soil borings as part of the installation of four (4) additional permanent groundwater monitoring wells.

Bay West continuously logged the lithology and waste observed in the soil borings. Soil samples collected from the soil borings were field screened for organic vapors using a photoionization detector (PID) equipped with a 10.6 electron-volt (eV) lamp. A combustible gas indicator was used to monitor for explosive gas conditions and a PID was used to monitor organic vapors emanating from the subsurface during drilling activities.

One soil sample was collected from each boring from the depth interval with the highest PID (organic vapor) reading. In the absence of elevated PID readings, soil samples were collected from depth intervals either exhibiting landfill waste impacts or at the transition where native and fill soils were in contact with one another.

Nine (9) soil samples, including quality control (QC) samples, were submitted for laboratory analysis of DRO; six of the nine samples were additionally sampled for dioxins/furans and per- and poly-fluoroalkyl substances (PFAS). Deviation from the original soil investigation scope of

work included analysis of dioxins/furans instead of 2,3,7,8 tetrachlorodibenzodioxin (2,3,7,8-TCDD) equivalents due to laboratory error.

Groundwater Investigation

Four additional permanent monitoring wells were constructed in four of the soil borings advanced at locations further out from the Site boundaries. The wells were completed as above-grade, two-inch diameter PVC-cased wells with ten-foot long PVC screens, and protected using above-grade steel casing. Bay West employed low-flow sampling techniques to purge and sample the monitoring wells. The U.S. EPA has developed this technique (EPA EQASOP-GW4) to minimize stress on the well and to provide the most representative sample of formation water.

Up to 30 groundwater samples, including QC samples, were submitted for laboratory analysis of 1,4-dioxane, dioxins/furans, DRO, PFAS, 2,3,7,8-TCDD equivalents, gross alpha, nitrogen as nitrate/nitrite.

Deviations from the original groundwater investigation scope of work included the following:

- Additional analysis for dioxins/furans instead of 2,3,7,8-TCDD equivalents during the October 2020 sampling event due to laboratory error;
- Missing gross alpha and nitrogen as nitrate/nitrite analysis during the October 2020 sampling event by Bay West due to laboratory bottle order omissions; and
- PFAS were analyzed using EPA Method 527M for the October 2020 sampling event and by using the PFAS-ID36 Method for the February and May 2021 sampling events based on sampling methodology availability for additional compounds for no additional fees.

Based on the data made available by additional analysis or the data available during the second and third quarter groundwater sampling events, these deviations are not expected to affect our conclusions and recommendations regarding FY2021 investigation conclusions or FY2022 fieldwork recommendations.

Investigation-derived Waste

The investigation derived waste (IDW) (i.e., soil boring cuttings and associated landfill debris) was containerized in steel 55-gallon drums following the drilling activities. An IDW soil sample was collected from the drummed IDW and submitted for laboratory analysis of toxicity characteristic leaching procedure (TCLP) VOCs, TCLP semi-volatile organic compounds, TCLP RCRA metals, and TCLP pesticides/herbicides. The IDW drums were disposed at a State-contracted disposal facility for non-hazardous waste. Copies of the IDW drum characterization sample laboratory results and disposal documentation are attached in **Appendix A**.

3.3 Vapor Intrusion Assessment

The vapor intrusion assessment was performed in accordance with the current applicable MPCA guidance documents.

PSG Sampling

Bay West performed the following activities:

- Installation of five additional permanent soil gas monitoring points (PSGs 33 through 37) along the southern boundary of the landfill south of County Road F East.
- Collection of two rounds of soil gas samples from the newly installed permanent monitoring points. The PSG samples were collected using a 200 milliliter/minute (mL/min) flow controller attached to an individually certified summa canister and submitted for VOC analysis (individually certified summa cans are not available for methane and fixed gases). The PSGs were screened with a PID and combustible gas meter after collecting the analytical samples.

- The PSG analytical samples were analyzed for VOCs by USEPA Method TO-15 and the Minnesota Soil Gas List, methane by method TO-3M, and oxygen (fixed gases) by method TO-3C. A total of five samples were collected during the heating and cooling seasons due to elevations of the water table which submerged PSGs 35-37 during the heating season. Despite installation in dry conditions, PSG-34 was not sampled following installation in either the cooling or heating seasons due to screen submersion at the time of the sampling events.

Two rounds of sub-slab vapor sampling at 620 County Road F East were planned for FY2021; however, based on the active COVID-19 pandemic and lack of site access, the sampling was not performed.

On-site Buildings Indoor Air Screening

Bay West performed one round of methane indoor air screening at the on-site buildings: event/city center, warming house, and concession building. A methane field meter that reads in parts per million (ppm) and a combustible gas indicator (CGI) that measure the lower explosive limit (LEL) of methane were used to perform the indoor air screening. The findings of the methane indoor air screening are presented on **Table 6**.

4.0 FIELD WORK RESULTS

4.1 Soil Conditions

On October 13, 2020, Bay West advanced three soil borings (SB-17, SB-16, SB-18) to the west, north, and east of previous soil boring SW27-SB06, respectively.

Based on borings logs, the area surrounding SW27-SB06 is underlain by variable unconsolidated soils. Near the surface, either organic soils or poorly sorted fill soils are first encountered to depths of up to 12 feet bgs. Below these soils are intermittent lenses of clay, well-sorted sands with trace gravel, and sandy clays to depths of at least 30 feet bgs. Fill materials were observed in each boring, consisting of organics and asphalt to depths up to 7 feet bgs. Soil headspace readings using a PID ranged from 0.0 ppm up to 3.5 ppm. Indications of free product or other evidence of material release (visual, olfactory) were not encountered.

Soil encountered at soil borings for SW27-MW05 through SW27-MW08 consisted of alternating lenses of sands and clays. Cobbles were encountered by the drill rig in MW-05 and MW-06, resulting in several intervals without sample recovery. Cobbles were not encountered in MW-07 or MW-08, and soils contained greater amounts of sand and/or silt than the clayey soils in MW-05 and MW-06.

Bay West compiled the soil borings advanced during FY2020 and FY2021 to create soil cross-sections to better understand subsurface conditions at the Site and surrounding area. Below sands and gravels extending over the center of the Site are silt-sand mixtures, which appear to be somewhat continuous. Well screenings have been placed in both the sand/gravel and sand/silt lenses, though MW-05 extends through the silt-sand to a deeper sandy lens. The location of the cross-section lines are displayed on **Figure 3**, and the A-A' and B-B' cross section transects are included as **Figures 4A** and **4B**, respectively.

The complete soil headspace readings are summarized on **Table 1**. Boring locations are depicted on **Figures 2** and **5**. The field boring logs and notes are included in **Appendix B**.

4.2 Monitoring Well Installation

Four permanent groundwater monitoring wells (SW27-MW05 through SW27-MW08) were installed from October 12 – 16, 2020. Groundwater was measured at depths ranging from approximately 6 feet in MW-6 to 45 feet in MW-5 below the top of the well casings. Based on

three rounds of gauging and sampling, groundwater appears to be flowing toward the west, with evidence of mounding beneath the Site leading to flow toward the southeast near MW08. Groundwater elevations as collected from the top of casing (permanent wells) are summarized in **Table 2** and displayed as contours derived from the October 2020, February 2021, and May 2021 sampling events on **Figures 7A**, **7B**, and **7C**, respectively. The field boring logs, permanent well construction diagrams, and groundwater sampling logs are included in **Appendix B**.

4.3 Permanent Soil Gas Point Installation

Five permanent soil gas (PSG) monitoring points (PSG-33 through PSG-37) were installed on October 21, 2020. The PSG-33 through 36 monitoring screens were installed to approximately 3 feet bgs; due to the elevated water table at the time of installation, PSG-37 monitoring screen was installed at 2.75 feet bgs. The PSG risers were installed from grade to approximately 2.25-2.5 feet bgs and were protected by at-grade vault covers. Elevated PID readings from the PSG sampling lines were not observed above 0.0 ppm.

The PSG locations are depicted on **Figure 2**. Soil gas sampling field notes are included in **Appendix B**.

4.4 Landfill Gas Monitoring Results

On March 5, 2021, Bay West performed indoor air screening at the on-site buildings: event/city center, warming house, and concession building using a methane field meter that reads in ppm and a CGI that measure the lower explosive limit (LEL) of methane. Methane as a measure of LEL or percent by air volume was not detected during the field screening activities. The landfill gas monitoring results are presented in **Table 6**.

5.0 ANALYTICAL RESULTS

5.1 Soil

The soil headspace screening results are summarized in **Table 1**. The soil analytical results were compared to the MPCA 2013 Screening Soil Leaching Values (SLVs) and MPCA 2021 Tier 1 Residential and Tier 2 Industrial Soil Reference Values (SRVs) and are summarized in **Table 2**. The soil results that exceed screening criteria are summarized on **Figure 5**. The field boring logs and notes are included in **Appendix B**. The laboratory analytical reports are included in **Appendix C**. The soil results are summarized below by analyte type.

5.1.1 DRO

There are no applicable SLVs and SRVs for DRO; therefore, the DRO concentrations were compared to the MPCA Best Management Practices for the Off-Site Reuse of Unregulated Fill Criteria of 100 milligrams per kilogram (mg/kg).

DRO exceeded the Unregulated Fill Criteria of 100 mg/kg only in the sample collected from soil boring SW27-SB17 (0-5 feet bgs) at a concentration of 117 mg/kg. DRO also was detected in SW27-SB18 (2.5-7.5') at a concentration of 20 mg/kg, which is above the laboratory reporting limit but below the unregulated fill criteria. DRO was not detected above the laboratory reporting limit in the remaining soil samples collected during FY2021.

5.1.2 Dioxins/Furans

The 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalents (TEQ) were calculated using the dioxins/furans results for each soil sample. All 2,3,7,8-TCDD TEQ calculated concentrations were below their respective SLVs/SRVs.

Several other dioxins/furans (1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; octachlorodibenzofuran; and octachlorodibenzodioxin) were detected in one or more of the soil samples analyzed, but at concentrations below their respective action levels.

5.1.3 PFAS

PFAS analyzed by EPA Method 537 M were not detected above laboratory reporting limits in any of the soil samples submitted for laboratory analysis.

5.2 Groundwater

The groundwater sampling results were compared to the Minnesota Department of Health (MDH) Health Risk Limits (HRLs), Health-Based Values (HBVs), and Risk Assessment Advice (RAAs). The groundwater constituent results were compared to other applicable screening criteria (EPA Maximum Contaminant Levels [MCLs] or Health Advisory Levels [HALs]) for constituents with no applicable MDH criteria or where other more stringent criteria applies. The Groundwater results are summarized in **Table 4**. The groundwater results that exceed screening criteria are summarized on **Figure 6**. The groundwater results are summarized below by analyte type.

5.2.1 DRO

DRO results were compared to the MDH RAA for total petroleum hydrocarbons (TPH) of 50 micrograms per liter (µg/L). DRO was detected at concentrations greater than the RAA in SW27-MW-06 on October 28, 2020 (110 mg/kg) and SW27-MW08 on May 12, 2021 (180 mg/kg). The remaining DRO groundwater detections above the method detection limits were reported at estimated concentrations between 44 mg/kg and 59 mg/kg in SW27-MW03 and 36 mg/kg in MW-06 (May 12, 2021). DRO was not detected in the remaining samples at concentrations above the laboratory method detection or reporting limits.

5.2.2 1,4-Dioxane

1,4-Dioxane was not detected above the laboratory reporting limit in any of the groundwater samples submitted for laboratory analysis.

5.2.3 Dioxins

1,2,3,7,8-Pentachlorodibenzodioxin (PeCDD) and 1,2,3,6,7,8-hexachlorodibenzodioxin (HxCDD) were detected in one or more samples at concentrations above their respective laboratory detection or reporting limits, but below their respective MDH action levels. 2,3,7,8-TCDD was detected in one sample (SW27-MW02) at an estimated concentration of 1 picogram per liter (pg/L), but below the MDH action level of 10 pg/L. No additional dioxins were detected at concentrations above the laboratory reporting limits.

5.2.4 PFAS

Perfluorohexanesulfonic acid (PFHxS) was detected in SW27-MW01 and SW27-MW03 at concentrations above the MDH action level of 0.047 µg/L, ranging from 0.086 to 0.16 µg/L.
Perfluorooctane Sulfonate (PFOS) was detected in SW27-MW01, SW27-MW04, and SW27-MW07 at concentrations above the MDH action level of 0.015 µg/L, ranging from 0.021 to 0.23 µg/L.
Perfluorooctanoic Acid (PFOA) was detected in SW27-MW03 and SW27-MW08 at concentrations above the MDH action level of 0.035 µg/L, ranging from 0.0569 to 0.0723 µg/L.
The EPA health advisor level for combined PFOS and PFOA of 0.070 µg/L was exceeded in SW27-MW01 and SW27-MW07, calculated up to 0.07974 µg/L in SW27-MW07 (May 12, 2021) and 0.251 µg/L in SW27-MW01 (February 2, 2021).

The remaining PFAS identified in one or more samples at concentrations above laboratory detection or reporting limits (6:2 fluorotelomersulfonic acid, perfluorobutanesulfonic acid, perfluorobutyric acid, perfluoroheptanesulfonic acid, perfluoroheptanoic acid, perfluorohexanoic acid, perfluoropentanesulfonic acid, and perfluoropentanoic acid) were not found at concentrations above their respective MDH action levels.

5.2.5 Nitrate and Nitrite

Nitrate and nitrite were not detected at concentrations exceeding the HRL of 10 milligrams per liter (mg/L) in any of the groundwater samples submitted for laboratory analysis.

5.2.6 Gross Alpha

Gross alpha was not detected at concentrations exceeding the USEPA MCL of 15 picocuries per liter in any of the groundwater samples submitted for laboratory analysis.

5.3 Soil Gas

5.3.1 VOCs

The soil gas results were compared to the MPCA Residential and Industrial 33x ISVs, as the land use at the Site and immediately surrounding properties is a mix of residential and commercial.

VOCs were not detected at concentrations exceeding the ISVs or 33x Industrial or Residential ISVs in the soil gas samples submitted for laboratory analysis. The soil gas analytical results are summarized in **Table 5**.

5.3.2 Methane

There are no Residential or Commercial ISVs established for methane, therefore, methane concentrations were compared to the USEPA Action Level of 5,000 ppm per volume (ppmv), or 0.5%. Methane was detected at an estimated concentration of 61.2 ppmv in PSG-36 (October 16, 2020). Methane was not detected in any of the remaining soil gas samples at concentrations above the laboratory reporting limit.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Bay West makes the following conclusions and recommendations regarding the potential risks posed by the Site contamination:

6.1 Soil

Additional soil screening data indicates that the Site and surrounding area are underlain by unconsolidated sediments primarily consisting of alternating layers of sands, clays, or sandy clays, with trace amounts of organic material or urban fill. In general, the Site center is underlain by sand and gravel, with the surrounding area also underlain by sand and silt. To the west side of the Site, a deeper sand lens is encountered below the sand and silt. Based on groundwater well screen intervals, the sand and silt layers do not appear to act as confining units.

DRO was detected in SW27-SB17 at a concentration of 117 mg/kg (above the Unregulated Fill Criteria of 100 mg/kg) and in SW27-SB18 at a concentration of 20 mg/kg. DRO was not detected in the remaining soil samples submitted for laboratory analysis.

Several dioxins/furans were detected in one or more soil samples collected from the 7 soil borings completed as part of our scope of work, but at concentrations below their respective MPCA SLVs or SRVs.

PFAS were not detected at concentrations above their respective reporting limits in any of the soil samples submitted for laboratory analysis.

The DRO detection above the unregulated fill criteria appear to be isolated to a location within the former landfill boundaries and overall appear to diminish with distance. Based on the distribution of non-detections or below unregulated fill criteria, the detections of DRO in soil surrounding the Site, and the lack of immediate receptors, Bay West does not recommend further assessment for DRO in soil at this time.

6.2 Groundwater

Groundwater was detected at depths of approximately 6 to 45 feet below top of casing per groundwater sampling location. The addition of four new groundwater monitoring wells has enhanced our understanding of local groundwater flow, which appears to be toward the west and the southeast, with mounding over the Site.

DRO was detected during one or more sampling rounds in SW27-MW06 and SW27-MW08 at concentrations above the MDH RAA of 50 µg/L; the remaining DRO detections were below the RAA or the laboratory reporting limit.

PFHxS, PFOS, PFOA, and PFOS + PFOA were detected in one or more samples at concentrations above their respective MDH and EPA action levels.

Gross alpha, 1,4-dioxane, and nitrate/nitrite were not detected at concentrations above their respective action levels in any of the groundwater samples submitted for laboratory analysis.

DRO and several PFAS have been detected downgradient of the Site at concentrations above their respective action levels. Additionally, PFOS and PFOS + PFOA were detected up-gradient (SW27-MW06) at concentrations above action levels. These detections, within an order of magnitude from their respective action levels, do not have immediate receptors or appear to represent an uncontrolled release requiring expedited response actions.

In order to establish a consistent baseline for on and off-site impact concentrations in groundwater, Bay West recommends additional quarterly groundwater monitoring events to include full suite contaminant and attenuation analytes per landfill closure guidance.

6.3 Soil Gas

VOCs were not detected at concentrations above 33x their respective Residential or Commercial ISVs in the newly installed PSG points.

Methane was not detected at concentrations above action levels in either the PSG laboratory analytical samples or during landfill gas field screening activities.

Access has yet to be established for the property located at 620 County Road F East, where previous sampling events identified nearby elevated VOC concentrations in soil gas.

Based on a lack of consistent sampling data due to sampling events timed during an elevated water table, Bay West recommends additional sampling rounds from PSG-33 through PSG-37 to complete the site conceptual model regarding soil gas conditions along the southern edge of the Site.

PCE has historically been detected in exceedance of the 33x Residential ISV near the event/city center (159 µg/m^3 detected at SV-2, approximately 20 feet north of the building, in 2009). Bay West recommends completion of the planned sub-slab sampling events at 620 County Road F East once access is established.

Figures

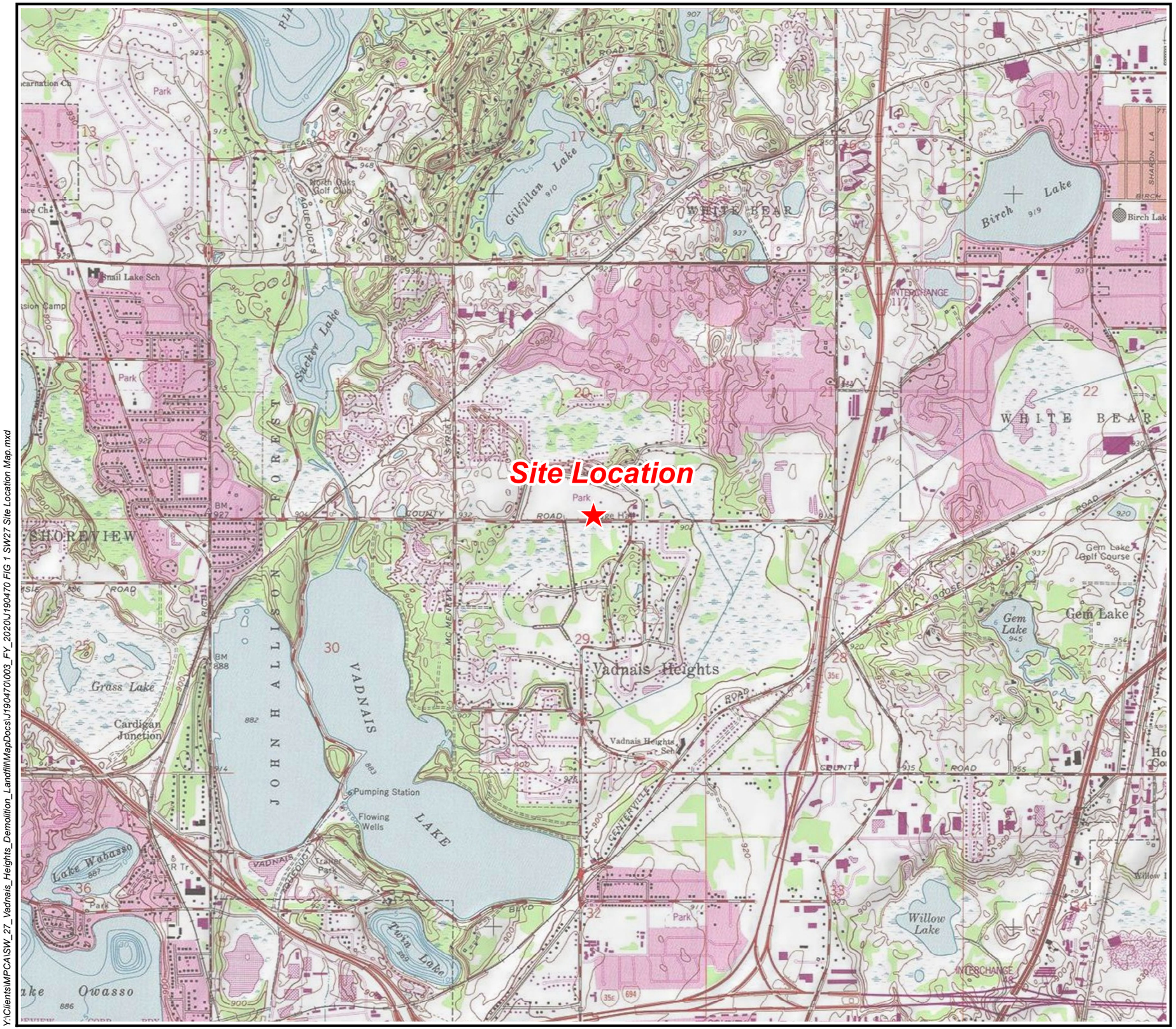
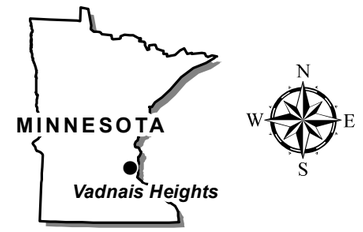


Figure 1

Site Location Map

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: National Geographic Society, i-cubed

0 2,000 4,000 Feet
0 600 1,200 Meters

★ Site Location

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/3/2020 Project No.J190470

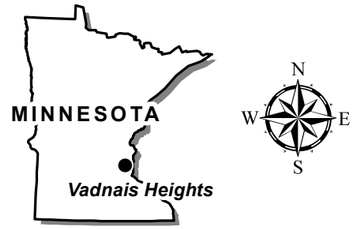
Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_LandfillMapDocs\J190470\003_FY_2020\J190470 FIG 1 SW27 Site Location Map.mxd

Figure 2

Sampling Locations

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: Ramsey County Aerial Imagery WMS, 2018

0 250 500 750 1,000 Feet

0 100 200 300 Meters

- Monitoring Well (Bay West, 2020 - 2021)
- Temporary Well (Historical)
- Permanent Soil Gas Sample (Bay West, 2021)
- Site Boundary
- Commercial or Industrial Properties
- Residential

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/28/2021 Project No.J200402

Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_Landfill\MapDocs\J200402\001_FY_2021\J200402 FIG 2 SW27 Sampling Locations.mxd

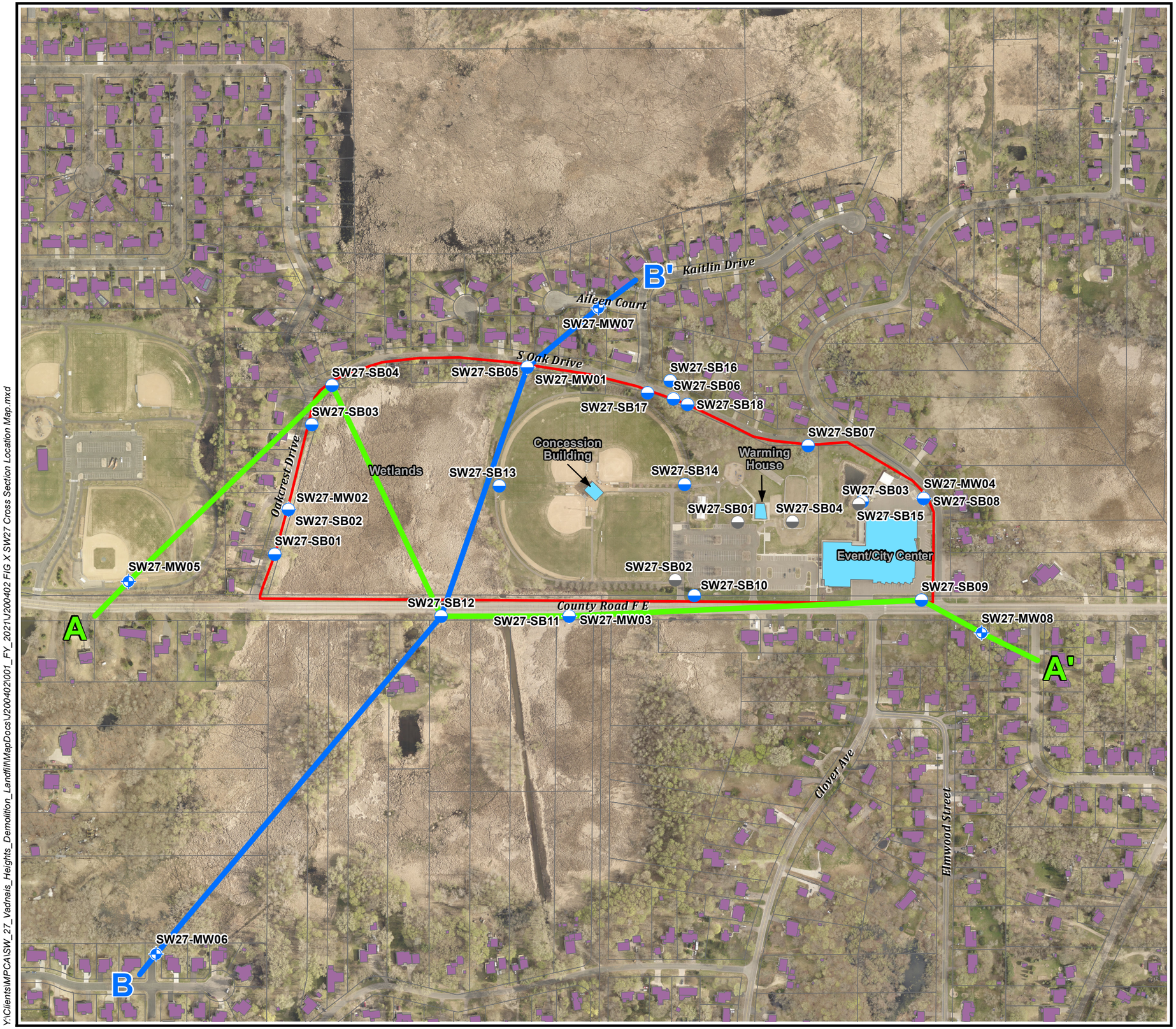


Figure 3

Cross Section Location Map

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: Ramsey County Aerial Imagery WMS, 2018

0 250 500 750 1,000 Feet
0 100 200 300 Meters

- Soil Boring (Bay West, 2017)
- Soil Boring (Bay West, 2020-2021)
- Monitoring Well (Bay West, 2020)
- Cross Section Line A to A'
- Cross Section Line B to B'
- Site Boundary
- Commercial or Industrial Properties
- Residential

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/26/2021 Project No.J200402

Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_Landfill\MapDocs\J200402\001_FY_2021\J200402 FIG X SW27 Cross Section Location Map.mxd

A

A'

SW27-MW05	Oct-20	Feb-21	May-21
DRO	< 100	< 110	< 98
PFHxS	< 0.00470	< 0.00092	**0.00066**
PFOS	< 0.00480	< 0.00094	< 0.00048
PFOA	< 0.0050	< 0.0010	**0.00063**
PFOS + PFOA	---	---	**0.00063**

SW27-MW03	Oct-20	Feb-21	May-21
DRO	**52 J**	**59 J**	**44 J**
PFHxS	**0.1**	**0.11**	**0.0873**
PFOS	< 0.00470	**0.0019**	**0.00246 J**
PFOA	**0.067**	**0.061**	**0.0569**
PFOS + PFOA	**0.067**	**0.0629**	**0.05936 J**

SW27-MW08	Oct-20	Feb-21	May-21
DRO	< 100	< 100	**180**
PFHxS	< 0.0170	< 0.0034	**0.00382**
PFOS	< 0.0170	< 0.0034	**0.00705**
PFOA	< 0.0180	**0.0095**	**0.0723**
PFOS + PFOA	---	**0.0095**	**0.00705**

Sample ID (Sample Date)	Screening	Source
Diesel Range Organics (DRO)	50	RAA
Perfluorohexanesulfonate (PFHxS)	0.047	HBV
Perfluorooctanesulfonate (PFOS)	0.027	HBV
Perfluorooctanoic acid (PFOA)	0.035	HBV
PFOS + PFOA	0.070	EPA [2]

Notes:

Bold result = Detected above laboratory reporting limits

< = Not detected above laboratory reporting limit

--- = Not Calculated

ng/L = nanograms per liter

ft bgs = feet below ground surface

mg/kg = milligram per kilogram

*From MPCA Best Management Practices for the Off-Site Reuse of Unregulated Fill Criteria of 100 mg/kg

HBV = Minnesota Department of Health (MDH) Health Based Value

RAA = MDH Risk Assessment Advice

[1]Results were compared to the lowest applicable screening criteria

[2]US Environmental Protection Agency (USEPA) health advisory level for PFOS + PFOA (November 2016)

Blue shading = Result exceeds applicable screening criteria

Elevation (feet above mean sea level)

Distance Along Baseline (feet)

Vertical Scale (feet): 10

Horizontal Scale (feet): 500

Sand

Silt

Sand and Silt

Sand and Gravel

Groundwater Elevation

Limit of Found Landfill Material

Boring

PID (ppm)

Well Screen

ENGR'G	PLS	Bay West — Customer-Focused Environmental & Industrial Solutions
DRAWN	7-Jun-21	
REV.	v1	
PROJECT NAME	SW#27 Vadnais Heights Demolition Landfill	
TITLE	CROSS SECTION A - A'	
DWG. NO. SW27_J200402_210426.dwg	SCALE AS SHOWN	FIGURE # 4A

Z:\Commercial\MPCA\SW27 Vadnais Heights Demo Landfill\SW27_J200402_210426.dwg

B

B'

SW27-MW06	Oct-20	Feb-21	May-21
DRO	**110**	< 100	**36 J**
PFHxS	< 0.00440	< 0.00093	< 0.00092
PFOS	< 0.00450	< 0.00094	**0.001 J**
PFOA	**0.006**	**0.0065**	**0.0071**
PFOS + PFOA	**0.017**	**0.0065**	**0.0081**

SW27-MW01	Oct-20	Feb-21	May-21
DRO	< 110	< 100	< 98
PFHxS	**0.10 J**	**0.16**	**0.127**
PFOS	**0.093 J**	**0.23**	**0.102**
PFOA	**0.02**	**0.021**	**0.0193**
PFOS + PFOA	**0.114 J**	**0.251**	**0.1213**

SW27-MW07	Oct-20	Feb-21	May-21
DRO	< 110	< 100	< 96
PFHxS	< 0.00460	**0.003**	**0.0282**
PFOS	**0.012**	**0.0066**	**0.0739**
PFOA	**0.011**	**0.0089**	**0.00684**
PFOS + PFOA	**0.023**	**0.0155**	**0.07974**

Notes:

Bold result = Detected above laboratory reporting limits

< = Not detected above laboratory reporting limit

--- = Not Calculated

ng/L = nanograms per liter

ft bgs = feet below ground surface

mg/kg = milligram per kilogram

*From MPCA Best Management Practices for the Off-Site Reuse of Unregulated Fill Criteria of 100 mg/kg

HBV = Minnesota Department of Health (MDH) Health Based Value

RAA = MDH Risk Assessment Advice

(1)Results were compared to the lowest applicable screening criteria

(2)US Environmental Protection Agency (USEPA) health advisory level for PFOS + PFOA (November 2016)

Blue shading = Result exceeds applicable screening criteria

Sample ID (Sample Date)	Screening	Source
Diesel Range Organics (DRO)	50	RAA
Perfluorohexanesulfonate (PFHxS)	0.047	HBV
Perfluorooctanesulfonate (PFOS)	0.027	HBV
Perfluorooctanoic acid (PFOA)	0.035	HBV
PFOS + PFOA	0.070	EPA (2)

Elevation (feet above mean sea level)

Distance Along Baseline (feet)

Vertical Scale (feet) 10

Horizontal Scale (feet) 500

Sand

Silt

Sand and Silt

Sand and Gravel

Groundwater Elevation

Limit of Found Landfill Material

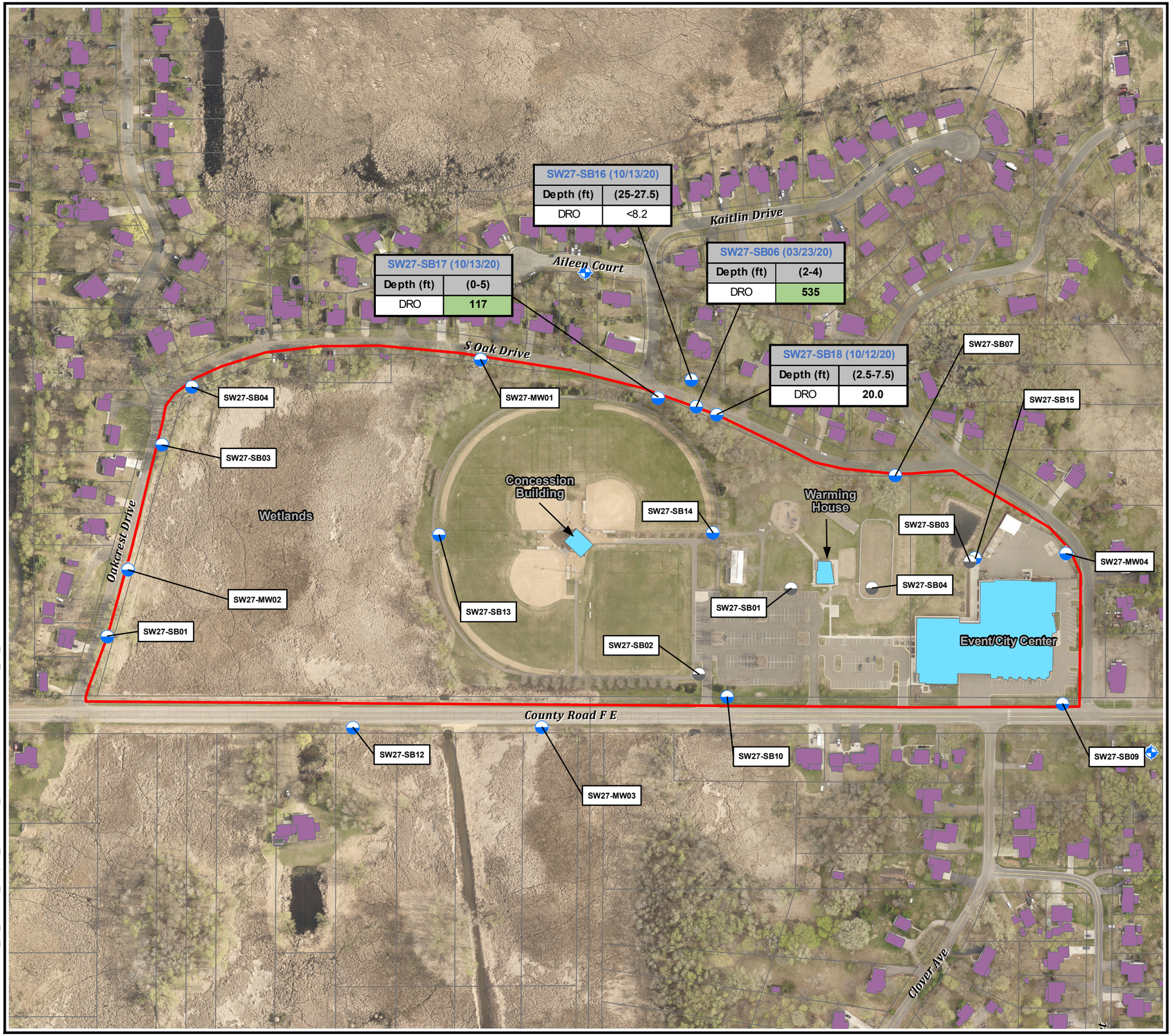
Boring

PID (ppm)

Well Screen

ENGR'G	PLS	Bay West
DRAWN	7-Jun-21	Customer-Focused Environmental & Industrial Solutions
REV.	v1	
PROJECT NAME	SW#27 Vadnais Heights Demolition Landfill	
TITLE	CROSS SECTION B - B'	
DWG. NO. SW27_J200402_210426.dwg	SCALE AS SHOWN	FIGURE # 4B

Z:\Commercial\MPCA\SW27 Vadnais Heights Demo Landfill\SW27_J200402_210426.dwg



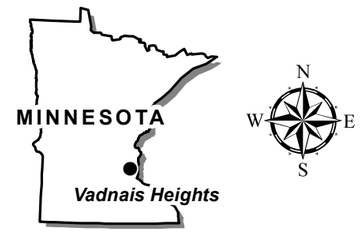
Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_Landfill\MapDocs\J200402\001_FY_2021\J200402 FIG 3 SW27 Soil Analytical Results.mxd

Figure 5

Soil Analytical Results

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: Ramsey County Aerial Imagery WMS, 2018

0 250 500 750 Feet
0 100 200 Meters

- Soil Boring (Bay West, 2017)
- Soil Boring (Bay West, 2020-2021)
- Monitoring Well (Bay West, 2020)
- Site Boundary
- Commercial or Industrial Properties
- Residential

Sample ID (Sample Date) Sample Depth in ft bgs	Unregulated Fill Criteria
Diesel Range Organics (DRO) - mg/kg	100

Notes:

ft bgs = feet below ground surface

mg/kg = milligrams per kilogram

*From MPCA Best Management Practices for the Off-Site Reuse of Unregulated Fill Criteria of 100 mg/kg

Bold = Detected above laboratory reporting limits

< = not detected above laboratory reporting limits

Underlined result = The detection limit exceeds the low est applicable standard

*Green shading = Result exceeds MPCA Unregulated Fill Criteria

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/11/2021 Project No.J190470

SW27-MW01	Oct-20	Feb-21	May-21
DRO	< 110	< 100	< 98
PFHxS	**0.10 J**	**0.16**	**0.127**
PFOS	**0.093 J**	**0.23**	**0.102**
PFOA	**0.02**	**0.021**	**0.0193**
PFOS + PFOA	**0.114 J**	**0.251**	**0.1213**

SW27-MW07	Oct-20	Feb-21	May-21
DRO	< 110	< 100	< 96
PFHxS	< 0.00460	**0.003**	**0.0282**
PFOS	**0.012**	**0.0066**	**0.0739**
PFOA	**0.011**	**0.0089**	**0.00584**
PFOS + PFOA	**0.023**	**0.0155**	**0.07974**

SW27-MW04	Oct-21	Feb-21	May-21
DRO	< 120	< 100	< 98
PFHxS	< 0.0180	**0.0046**	**0.00374**
PFOS	**0.021**	**0.007 J**	**0.00562 J**
PFOA	< 0.0190	**0.0052**	**0.00528**
PFOS + PFOA	**0.021**	**0.0122 J**	**0.0109 J**

SW27-MW05	Oct-20	Feb-21	May-21
DRO	< 100	< 110	< 98
PFHxS	< 0.00470	< 0.00092	**0.00066**
PFOS	< 0.00480	< 0.00094	< 0.00048
PFOA	< 0.0050	< 0.0010	**0.00063**
PFOS + PFOA	---	---	**0.00063**

SW27-MW08	Oct-20	Feb-21	May-21
DRO	< 100	< 100	**180**
PFHxS	< 0.0170	< 0.0034	**0.00382**
PFOS	< 0.0170	< 0.0034	**0.00705**
PFOA	< 0.0180	**0.0095**	**0.0723**
PFOS + PFOA	---	**0.0095**	**0.00705**

SW27-MW02	Oct-20	Feb-21	May-21
DRO	< 110	< 100	< 98
PFHxS	< 0.00420	**0.0011**	**0.00081**
PFOS	< 0.00460	**0.00099**	**0.00118 J**
PFOA	**0.012**	**0.011**	**0.011**
PFOS + PFOA	**0.012**	**0.01199**	**0.01218**

SW27-MW03	Oct-20	Feb-21	May-21
DRO	**52 J**	**59 J**	**44 J**
PFHxS	**0.1**	**0.11**	**0.0873**
PFOS	< 0.00470	**0.0019**	**0.00246 J**
PFOA	**0.067**	**0.061**	**0.0569**
PFOS + PFOA	**0.067**	**0.0629**	**0.05936 J**

SW27-MW06	Oct-20	Feb-21	May-21
DRO	**110**	< 100	**36 J**
PFHxS	< 0.00440	< 0.00093	< 0.00092
PFOS	< 0.00450	< 0.00094	**0.001 J**
PFOA	**0.006**	**0.0065**	**0.0071**
PFOS + PFOA	**0.017**	**0.0065**	**0.0081**

Notes:

(1)Results were compared to the lowest applicable screening criteria

(2)US Environmental Protection Agency (USEPA) health advisory level for PFOS + PFOA (November 2016).

Bold result = Detected above laboratory reporting limits

< = Not detected above laboratory reporting limit

--- = Not Calculated

ug/L = Micrograms per liter

pg/L = Picograms per liter

Blue shading = Result exceeds applicable screening criteria

HBV = Minnesota Department of Health (MDH) Health Based Value

RAA = MDH Risk Assessment Advice

BLUE = (Bay West)

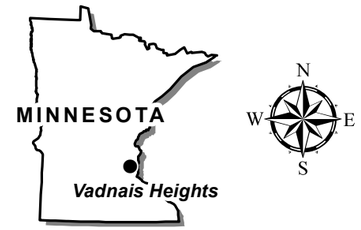
BLACK = Historical Samples (other consultants)

Figure 6

Groundwater Analytical Results

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: Ramsey County Aerial Imagery WMS, 2018

0 250 500 750 Feet
0 100 200 Meters

- Monitoring Well (Bay West, 2020 -2021)
- Temporary Well (Bay West)
- Site Boundary
- Commercial or Industrial Properties
- Residential

Sample ID (Sample Date)	Screening Criteria(1)	Source
Diesel Range Organics (DRO)	50	RAA
Perfluorohexanesulfonate (PFHxS)	0.047	HBV
Perfluorooctanesulfonate (PFOS)	0.027	HBV
Perfluorooctanoic acid (PFOA)	0.035	HBV
PFOS + PFOA	0.070	EPA(2)

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/11/2021 Project No.J200402

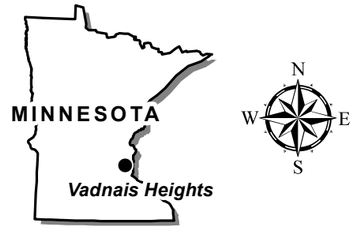
Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_Landfill\MapDocs\J200402001_FY_2021\J200402 FIG 5 SW27 Groundwater Analytical Results.mxd

Figure 7A

Groundwater Elevation Contour Map (October 2020)

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: Ramsey County Aerial Imagery WMS, 2018

0 250 500 750 1,000 Feet
0 100 200 300 Meters

- Monitoring Well (Bay West, 2020 - 2021)
- Temporary Well (Bay West)
- Groundwater Elevation Contour Line
- (900.06) Groundwater Elevation at Well (ft amsl)
- Site Boundary
- Commercial or Industrial Properties
- Residential

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/11/2021 Project No.J200402

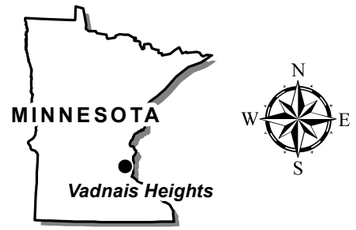
Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_Landfill\MapDocs\J200402\001_FY_2021\J200402 FIG 4A SW27 Groundwater Elevation Contour Map (October 2020).mxd

Figure 7B

Groundwater Elevation Contour Map (February 2021)

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: Ramsey County Aerial Imagery WMS, 2018

0 250 500 750 1,000 Feet
0 100 200 300 Meters

- Monitoring Well (Bay West, 2020 - 2021)
- Temporary Well (Bay West)
- Groundwater Elevation Contour Line
- (899.25) Groundwater Elevation at Well (ft amsl)
- Site Boundary
- Commercial or Industrial Properties
- Residential

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/11/2021 Project No.J200402

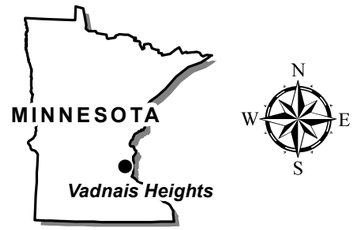
Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_Landfill\MapDocs\J200402\001_FY_2021\J200402 FIG 4B SW27 Groundwater Elevation Contour Map (February 2021).mxd

Figure 7C

Groundwater Elevation Contour Map (May 2021)

SW#27-Vadnais Heights Demolition Landfill

655 County Road F East
Vadnais Heights, MN



Map Projection: NAD 1983 UTM Zone 15 N, Meters
Basemap: Ramsey County Aerial Imagery WMS, 2018

0 250 500 750 1,000 Feet
0 100 200 300 Meters

- Monitoring Well (Bay West, 2020 - 2021)
- Temporary Well (Bay West)
- Groundwater Elevation Contour Line
- (900.19) Groundwater Elevation at Well (ft amsl)
- Site Boundary
- Commercial or Industrial Properties
- Residential

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: N.J. Date Drawn/Revised:6/11/2021 Project No.J200402

Y:\Clients\MPCA\SW_27_Vadnais_Heights_Demolition_Landfill\MapDocs\J200402\001_FY_2021\J200402 FIG 4C SW27 Groundwater Elevation Contour Map (May 2021).mxd

Tables

Table 1

Soil Headspace Results
SW27 Vadnais Heights Landfill
651 County Road F East
Vadnais Heights, MN
Bay West Job 200402

Depth (ft bgs)	Sample Location:	SW27-MW05	SW27-MW06	SW27-MW07	SW27-MW08	SW27-SB16	SW27-SB17	SW27-SB18
	Date:	10/13/2020	10/14/2020	10/15/2020	10/16/2020	10/13/2020	10/13/2020	10/13/2020
0-2.5		1.9	1.9	0.1	0.2	0.0	3.5	0.0
2.5-5		0.4	2.1	0.4	1.1	0.0	1.8	2.3
5-7.5		NR	2.2	0.7	1.3	0.0	0.2	0.2
7.5-10			2.1	0.5	2.0	0.0	0.5	0.0
10-12.5		2.5	2.2	0.2	1.8	0.0	0.6	0.3
12.5-15		0.7	1.8	0.2	1.5	0.0	0.5	0.0
15-17.5		2.2	1.3	0.0		0.0	0.3	0.0
17.5-20		1.0	1	0.0		0.0	0.2	0.0
20-22.5		0.3	0.0			0.0	1.3	0.3
22.5-25		0.3	0.0			0.0	1.2	0.1
25-27.5		0.9				0.5	0.8	0.0
27.5-30		0.2				0.2	0.4	0.0
30-32.5		0.9						
32.5-35		0.5						
35-37.5		2.0						
37.5-40		2.0						
40-42.5		0.0						
42.5-45		0.0						
DTB		NE	NE	NE	NE	NE	NE	NE
EOB		45	25	20	15	30	30	

Notes:
All results in parts per million (ppm).

PID = Photoionization detector

ft bgs = Feet below the ground surface

NR = No sample recovery

DTB = Depth to bedrock

NE = Not encountered

EOB = End of soil boring

Table 2
Groundwater Elevations
SW27 Vadnais Heights Landfill
651 County Road F East
Vadnais Heights, MN
Bay West Job J200402

Well ID	Elevation (feet)	Gauging Date	GW Gauge Level (ft BTOC)	GW Elevation (ft BTOC)
MW-1	905.29	10/28/20	5.91	899.38
		02/01/21	6.61	898.68
		05/10/21	5.87	899.42
MW-2	904.57	10/29/20	7.43	897.14
		02/01/21	8.03	896.54
		05/10/21	7.49	897.08
MW-3	902.16	10/29/20	3.51	898.65
		02/01/21	3.97	898.19
		05/10/21	3.52	898.64
MW-4	906.83	10/30/20	6.77	900.06
		02/01/21	7.58	899.25
		05/10/21	6.64	900.19
MW-5	937.86	10/29/20	44.03	893.83
		02/01/21	44.57	893.29
		05/10/21	44.89	892.97
MW-6	904.84	10/28/20	7.65	897.19
		02/01/21	8.45	896.39
		05/10/21	5.99	898.85
MW-7	913.15	10/28/20	13.69	899.46
		02/01/21	14.35	898.80
		05/10/21	13.61	899.54
MW-8	904.26	10/30/20	10.41	893.85
		02/01/21	9.72	894.54
		05/10/21	6.08	898.18

Notes:
Elevations collected from the top of the well casing and used for the top and bottom of screen interval
BTOC = below top of casing

Table 3
Soil Sample Results
SW27 Vadnais Heights Landfill
651 County Road F East
Vadnais Heights, MN
Bay West Job J200402

Sample name Sample depth (feet) Sample date		MPCA SLV	MPCA SRV INDUSTRIAL	MPCA SRV RESIDENTIAL	SW-27-MW-05 (40-45) 10/13/2020	SW27-MW-06 (20-22.5) 10/14/2020	SW27-MW-07 (10-15) 10/15/2020	SW27-MW-08 (7.5-12.5) 10/16/2020	SW27-SB-16 (25-27.5) 10/13/2020	SW27-SB-17 (0-5) 10/13/2020	SW27-SB-18 (2.5-7.5) 10/12/2020
WI MOD DRO and WI MOD GRO (mg/kg)											
WDRO C10-C28	WDRO C10-C28	100*			< 7.8	< 8.5	< 7.9	< 11.4	< 8.2	**117**	**20.0**
Perfluorinated analytes SGS AXYS method MLA-041 unless otherwise noted (ng/g)											
PFBA	45048-62-2	NE	280,000,000	63,000,000	---	---	---	---	---	---	---
PFBA [EPA 537M]	375-22-4	NE	280,000,000	63,000,000	< 0.25	< 0.23	< 0.24	< 0.23	---	---	---
PFPeA	45167-47-3	NE	NE	NE	---	---	---	---	---	---	---
PFPeA [EPA 537M]	2706-90-3	NE	NE	NE	< 0.25	< 0.23	< 0.24	< 0.23	---	---	---
PFHxA	92612-52-7	NE	NE	NE	---	---	---	---	---	---	---
PFHxA [EPA 537M]	307-24-4	NE	NE	NE	< 0.25	< 0.23	< 0.24	< 0.23	---	---	---
PFHpA	120885-29-2	NE	NE	NE	---	---	---	---	---	---	---
PFOA	45285-51-6	NE	3,200,000	2,400,000	---	---	---	---	---	---	---
PFOA [EPA 537M]	335-67-1	NE	3,200,000	2,400,000	< 0.25	< 0.23	< 0.24	< 0.23	---	---	---
PFNA	72007-68-2	NE	NE	NE	---	---	---	---	---	---	---
PFDA	73829-36-4	NE	NE	NE	---	---	---	---	---	---	---
PFUnA	196859-54-8	NE	NE	NE	---	---	---	---	---	---	---
PFDoA	171978-95-3	NE	NE	NE	---	---	---	---	---	---	---
PFBS	45187-15-3	NE	77,000,000	5,700,000	---	---	---	---	---	---	---
PFBS [EPA 537M]	375-73-5	NE	77,000,000	5,700,000	< 0.22	< 0.21	< 0.21	< 0.20	---	---	---
PFHxS	108427-53-8	NE	1,700,000	130,000	---	---	---	---	---	---	---
PFHxS [EPA 537M]	355-46-4	NE	1,700,000	130,000	< 0.23	< 0.22	< 0.22	< 0.22	---	---	---
PFOS	45298-90-6	NE	560,000	41,000	---	---	---	---	---	---	---
PFOS [EPA 537M]	1763-23-1	NE	560,000	41,000	< 0.24	< 0.22	< 0.23	< 0.22	---	---	---
PFOSA	754-91-6	NE	NE	NE	---	---	---	---	---	---	---
Dioxins Method 8290 (ng/kg)											
2,3,7,8-TCDF	51207-31-9	NE	NE	NE	< 0.29	< 0.29	< 0.34	< 0.51	---	---	---
2,3,7,8-TCDD	1746-01-6	299	28	7	< 0.18	< 0.42	< 0.2	< 0.21	---	---	---
1,2,3,7,8-PeCDF	57117-41-6	NE	NE	NE	< 0.16	< 0.11	< 0.32	< 0.14	---	---	---
2,3,4,7,8-PeCDF	57117-31-4	NE	NE	NE	< 0.086	< 0.033	< 0.19	< 0.081	---	---	---
1,2,3,7,8-PeCDD	40321-76-4	NE	NE	NE	< 0.18	< 0.47	< 0.37	< 0.22	---	---	---
1,2,3,4,7,8-HxCDF	70648-26-9	NE	NE	NE	< 0.22	< 0.044	< 0.16	< 0.11	---	---	---
1,2,3,6,7,8-HxCDF	57117-44-9	NE	NE	NE	< 0.12	< 0.052	< 0.12	< 0.11	---	---	---
2,3,4,6,7,8-HxCDF	60851-34-5	NE	NE	NE	< 0.26	< 0.065	< 0.16	< 0.12	---	---	---
1,2,3,7,8,9-HxCDF	72918-21-9	NE	NE	NE	< 0.17	< 0.11	< 0.21	< 0.15	---	---	---
1,2,3,4,7,8-HxCDD	39227-28-6	NE	NE	NE	< 0.2	< 0.27	< 0.12	< 0.15	---	---	---
1,2,3,6,7,8-HxCDD	57653-85-7	NE	NE	NE	< 0.21	< 0.22	< 0.12	< 0.1	---	---	---
1,2,3,7,8,9-HxCDD	19408-74-3	NE	NE	NE	< 0.16	< 0.14	< 0.091	< 0.11	---	---	---
1,2,3,4,6,7,8-HpCDF	67562-39-4	NE	NE	NE	< 0.16	< 0.062	< 0.2	**0.83J**	---	---	---
1,2,3,4,7,8,9-HpCDF	55673-89-7	NE	NE	NE	< 0.22	< 0.093	< 0.19	< 0.15	---	---	---
1,2,3,4,6,7,8-HpCDD	35822-46-9	NE	NE	NE	< 0.31	**0.35J**	**0.2J**	**4.5J**	---	---	---
OCDF	39001-02-0	NE	NE	NE	< 0.53	**0.29J**	< 0.39	< 0.35	---	---	---
OCDD	3268-87-9	NE	NE	NE	**0.58J**	**2.2J**	< 0.55	**42**	---	---	---
Total TCDF	30402-14-3	NE	NE	NE	< 0.29	< 0.29	< 0.34	< 0.51	---	---	---
Total TCDD	41903-57-5	NE	NE	NE	< 0.18	**33**	< 0.2	**3.6**	---	---	---
Total PeCDF	30402-15-4	NE	NE	NE	< 0.12	**0.16J**	< 0.26	**0.29J**	---	---	---
Total PeCDD	36088-22-9	NE	NE	NE	< 0.18	**28**	< 0.37	**3.3J**	---	---	---
Total HxCDF	55684-94-1	NE	NE	NE	< 0.19	**0.11J**	< 0.16	**0.38J**	---	---	---
Total HxCDD	34465-46-8	NE	NE	NE	< 0.19	**15**	< 0.11	**3.3J**	---	---	---
Total HpCDF	38998-75-3	NE	NE	NE	< 0.19	< 0.078	< 0.19	**2.4J**	---	---	---
Total HpCDD	37871-00-4	NE	NE	NE	< 0.31	< 0.057	**0.2J**	**8.4**	---	---	---
TEQ	E17134024	299	28	7	**0.00017**	**0.0042**	**0.0023**	**0.067**	---	---	---

Notes:
Bolded data indicates a detectable amount of an analyte.
J = estimated value
B = result associated with method blank contamination
--- = not analyzed/not sampled for
< = not detected above laboratory reporting limit
mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
ng/g = nanograms per gram
MPCA = Minnesota Pollution Control Agency
SLV = Soil Leaching Value
SRV = Soil Reference Value
NE = action level not established for an analyte
Blue shading = Result exceeds June 2013 SLVs
Yellow shading = Result exceeds May 2021 Residential SRVs
Orange shading = Result exceeds May 2021 Industrial SRVs
Green shading = Result exceeds MPCA Unregulated Fill Criteria
An underlined value indicates a non-detectable amount of an analyte which value exceeds an action level.
*From MPCA Best Management Practices for the Off-Site Reuse of Unregulated Fill Criteria of 100 mg/kg

Table 4
Groundwater Sample Results
SW27 Vadnais Heights Landfill
651 County Road F East
Vadnais Heights, MN
Bay West Job J200402

Bay West

Sample Name		HRL / HBV / RAA [1]	Result	SW27-MW01			SW27-MW02			SW27-MW03			SW27-MW04			SW27-MW05			SW27-MW06			SW27-MW07			SW27-MW08		
Sample Date			Unit	10/28/2020	2/2/2021	5/10/2021	10/29/2020	2/3/2021	5/10/2021	10/29/2020	2/1/2021	5/11/2021	10/30/2020	2/3/2021	5/11/2021	10/29/2020	2/2/2021	5/11/2021	10/28/2020	2/2/2021	5/12/2021	10/28/2020	2/3/2021	5/12/2021	10/30/2020	2/1/2021	5/12/2021
Nitrate and nitrite EPA 353.2 (mg/L)																											
Nitrate/Nitrite	NN	10	mg/L	---	**1.50**	**1.00**	---	**0.14**	**0.71 J**	---	**0.034 J**	**0.026 J**	---	< 0.1	**0.11**	---	**0.87**	**1.5**	---	< 0.1	**0.024 J**	---	**1.1**	**1.3**	---	**0.02 J**	**0.61**
1,4-Dioxane SW8270E (ug/L)																											
1,4-Dioxane	123-91-1	1	ug/L	< 0.24 J	< 0.24	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.23	< 0.25	< 0.23	< 0.23	< 0.25	< 0.25	< 0.24	< 0.25	< 0.24 J	< 0.25	< 0.25	< 0.26 J	< 0.23	< 0.25	< 0.24	< 0.25	< 0.25
WI MOD DRO AND WI MOD GRO (ug/L)																											
WDRO C10-C28	WDRO C10-C28	50	ug/L	< 110	< 100	< 98	< 110	< 100	< 98	**52 J**	**59 J**	**44 J**	< 120	< 100	< 98	< 100	< 110	< 98	**110**	< 100	**36 J**	< 110	< 100	< 96	< 100	< 100	**180**
WDRO C10-C32	WDRO C10-C32	50	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	< 100	---	---	< 96	---	---	**180**
WDRO C10-C36	WDRO C10-C36	50	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	< 100	---	---	< 96	---	---	**180**
Gross Alpha EPA 900.0 (pCi/L)																											
Gross alpha	12587-46-1	15[5]	pCi/L	---	**2.51±1.38**	**1.94±1.70**	---	**3.89±1.60**	**4.70±1.63**	---	**1.76±4.06**	**-0.693±4.38**	---	**2.43±3.01 J**	**13.2±5.97**	---	**2.43±1.22**	**3.39±1.96**	---	**6.34±2.28**	**9.27±5.43**	---	**0.840±1.86 J**	**0.311±1.14**	---	**2.35±1.60**	**9.10±4.80**
Dioxins Method 8290 (pg/L)																											
2,3,7,8-TCDF	51207-31-9	10	pg/L	< 0.3	---	---	< 0.81	---	---	< 0.36	---	---	< 0.76	---	---	< 0.5	---	---	< 0.34	---	---	< 0.38	---	---	< 0.63	---	---
2,3,7,8-TCDD	1746-01-6	10	pg/L	< 0.55	< 0.49	< 3.62	**1 J**	< 0.55	< 2.6	< 0.88	< 0.37	< 1.92	< 2	< 1.5	< 2.83	< 0.69	< 0.36	< 1.96	< 0.61	< 2.1	< 0.973	< 0.65	< 0.64	< 0.777	< 0.98	< 0.66	< 1.27
1,2,3,7,8-PeCDF	57117-41-6	50	pg/L	< 1.3	---	---	< 0.65	---	---	< 0.7	---	---	< 0.8	---	---	< 0.37	---	---	< 0.36	---	---	< 0.5	---	---	< 0.89	---	---
2,3,4,7,8-PeCDF	57117-31-4	50	pg/L	< 0.36	---	---	< 0.57	---	---	< 0.42	---	---	< 0.34	---	---	< 0.33	---	---	< 0.38	---	---	< 0.25	---	---	< 0.22	---	---
1,2,3,7,8-PeCDD	40321-76-4	50	pg/L	< 0.26	---	---	< 0.64	---	---	< 0.39	---	---	**7.5 J**	---	---	< 0.37	---	---	< 0.59	---	---	< 0.59	---	---	< 0.97	---	---
1,2,3,4,7,8-HxCDF	70648-26-9	50	pg/L	< 0.37	---	---	< 0.54	---	---	< 0.25	---	---	< 0.65	---	---	< 0.22	---	---	< 0.27	---	---	< 0.28	---	---	< 0.65	---	---
1,2,3,6,7,8-HxCDF	57117-44-9	50	pg/L	< 0.11	---	---	< 0.45	---	---	< 0.27	---	---	< 0.57	---	---	< 0.23	---	---	< 0.31	---	---	< 0.27	---	---	< 0.29	---	---
2,3,4,6,7,8-HxCDF	60851-34-5	50	pg/L	< 0.11	---	---	< 0.52	---	---	< 0.38	---	---	< 0.45	---	---	< 0.16	---	---	< 0.23	---	---	< 0.16	---	---	< 0.57	---	---
1,2,3,7,8,9-HxCDF	72918-21-9	50	pg/L	< 0.19	---	---	< 0.38	---	---	< 0.31	---	---	< 0.42	---	---	< 0.35	---	---	< 0.3	---	---	< 0.29	---	---	< 0.43	---	---
1,2,3,4,7,8-HxCDD	39227-28-6	50	pg/L	< 0.17	---	---	< 0.42	---	---	< 0.42	---	---	< 0.61	---	---	< 0.33	---	---	< 0.37	---	---	< 0.24	---	---	< 0.89	---	---
1,2,3,6,7,8-HxCDD	57653-85-7	50	pg/L	< 0.16	---	---	**0.95**	---	---	< 0.41	---	---	< 0.76	---	---	< 0.35	---	---	< 0.2	---	---	< 0.27	---	---	< 0.66	---	---
1,2,3,7,8,9-HxCDD	19408-74-3	50	pg/L	< 0.17	---	---	< 0.3	---	---	< 0.47	---	---	< 0.53	---	---	< 0.47	---	---	< 0.4	---	---	< 0.2	---	---	< 0.67	---	---
1,2,3,4,6,7,8-HpCDF	67562-39-4	50	pg/L	< 0.48	---	---	< 0.4	---	---	< 0.5	---	---	< 0.82	---	---	< 0.59	---	---	< 0.4	---	---	< 0.55	---	---	< 0.61	---	---
1,2,3,4,7,8,9-HpCDF	55673-89-7	50	pg/L	< 0.48	---	---	< 0.54	---	---	< 0.58	---	---	< 0.63	---	---	< 0.54	---	---	< 0.45	---	---	< 0.48	---	---	< 0.67	---	---
1,2,3,4,6,7,8-HpCDD	35822-46-9	50	pg/L	< 0.25	---	---	< 0.7	---	---	< 0.67	---	---	< 0.58	---	---	< 0.4	---	---	< 0.51	---	---	< 0.39	---	---	< 1.1	---	---
OCDF	39001-02-0	100	pg/L	< 1	---	---	< 1.1	---	---	< 1.1	---	---	< 1.1	---	---	< 0.77	---	---	< 0.7	---	---	< 1.2	---	---	< 1.1	---	---
OCDD	3268-87-9	100	pg/L	< 1	---	---	< 1.4	---	---	< 1.4	---	---	< 1.6	---	---	< 0.79	---	---	< 1.1	---	---	< 1.1	---	---	< 1.9	---	---
Total TCDF	30402-14-3	NE	pg/L	< 0.3	---	---	< 0.81	---	---	< 0.36	---	---	< 0.76	---	---	< 0.5	---	---	< 0.34	---	---	< 0.38	---	---	< 0.63	---	---
Total TCDD	41903-57-5	NE	pg/L	< 0.55	---	---	< 0.77	---	---	< 0.88	---	---	**140**	---	---	< 0.69	---	---	< 0.61	---	---	< 0.65	---	---	**59 J**	---	---
Total PeCDF	30402-15-4	NE	pg/L	< 0.81	---	---	< 0.61	---	---	< 0.56	---	---	< 0.57	---	---	< 0.35	---	---	< 0.37	---	---	< 0.38	---	---	< 0.56	---	---
Total PeCDD	36088-22-9	NE	pg/L	< 0.26	---	---	**1.5 J**	---	---	< 0.39	---	---	**110**	---	---	< 0.37	---	---	< 0.59	---	---	< 0.59	---	---	**56**	---	---
Total HxCDF	55684-94-1	NE	pg/L	< 0.2	---	---	< 0.47	---	---	< 0.53	---	---	< 0.52	---	---	< 0.24	---	---	< 0.28	---	---	< 0.25	---	---	< 0.48	---	---
Total HxCDD	34465-46-8	NE	pg/L	< 0.17	---	---	< 0.36	---	---	< 0.44	---	---	**62**	---	---	< 0.39	---	---	< 0.32	---	---	< 0.24	---	---	**28 J**	---	---
Total HpCDF	38998-75-3	NE	pg/L	< 0.48	---	---	< 0.47	---	---	< 0.54	---	---	< 0.72	---	---	< 0.56	---	---	< 0.43	---	---	< 0.52	---	---	< 0.64	---	---
Total HpCDD	37871-00-4	NE	pg/L	< 0.25	---	---	< 0.7	---	---	< 0.67	---	---	< 0.58	---	---	< 0.4	---	---	< 0.51	---	---	< 0.39	---	---	< 1.1	---	---
TEQ	E17134024	0.0014 [3]	pg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluorinated analytes SGS AXYS METHOD MLA-041 Rev 09 unless otherwise noted (ug/L)																											
10:2 fluorotelomersulfonic acid (10:2 FTS) [PFAS-ID36]	120226-60-0	NE	ug/L	---	< 0.00097	< 0.00046	---	< 0.00099	< 0.00047	---	< 0.00097	< 0.00049 J	---	< 0.0010	< 0.00048	---	< 0.00098	< 0.00050	---	< 0.00098	---	---	< 0.00095	---	---	< 0.0036	---
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS) [PFAS-ID36]	763051-92-9	NE	ug/L	---	< 0.00094	< 0.00045	---	< 0.00097	< 0.00046	---	< 0.00095	< 0.00048	---	< 0.00098	< 0.00046	---	< 0.00095	< 0.00049	---	< 0.00096	< 0.00095	---	< 0.00093	< 0.00048	---	< 0.0035	< 0.00095
2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (HFPO-DA) [PFAS-ID36]	13252-13-6	NE	ug/L	---	< 0.0010 J	< 0.00048	---	< 0.0010 J	< 0.00049	---	< 0.0010 J	< 0.00051	---	< 0.0010 J	< 0.00049	---	< 0.0010 J	< 0.00052	---	< 0.0010 J	< 0.00101	---	< 0.00099 J	< 0.00051	---	< 0.0037 J	< 0.0010
4,8-dioxa-3H-perfluorononanoic acid (DONA) [PFAS-ID36]	919005-14-4	NE	ug/L	---	< 0.00095	< 0.00045	---	< 0.00097	< 0.00046	---	< 0.00095	< 0.00048	---	< 0.00096	< 0.00047	---	< 0.00096	< 0.00049	---	< 0.00096	< 0.00095	---	< 0.00093	< 0.00048	---	< 0.0035	< 0.00095
4:2 fluorotelomersulfonic acid (4:2 FTS) [PFAS-ID36]	757124-72-4	NE	ug/L	---	< 0.00094 J	< 0.00045	---	< 0.00096 J	< 0.00046	---	< 0.00094 J	< 0.00047	---	< 0.00097 J	< 0.00046	---	< 0.00095 J	< 0.00049	---	< 0.00095 J	< 0.00095	---	< 0.00092 J	< 0.00048	---	< 0.0035 J	< 0.00094
6:2 fluorotelomersulfonic acid (6:2 FTS) [PFAS-ID36]	27619-97-2	NE	ug/L	---	< 0.00095 J	**0.00133**	---	< 0.00098 J	< 0.00046	---	< 0.00096 J	< 0.00048	---	< 0.00099 J	< 0.00047	---	< 0.00096	< 0.00049	---	< 0.00097 J	< 0.00096	---	< 0.00094 J	< 0.00049	---	< 0.0035 J	< 0.00095
8:2 fluorotelomersulfonic acid (8:2 FTS) [PFAS-ID36]	39108-34-4	NE	ug/L	---	< 0.00096 J	< 0.00046	---	< 0.00099 J	< 0.00047	---	< 0.00097 J	< 0.00049	---	< 0.0010 J	< 0.00047	---	< 0.00097	< 0.00050	---	< 0.00098 J	< 0.00097	---	< 0.00095 J	< 0.00049	---	< 0.0036 J	< 0.00096
9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ON) [PFAS-ID36]	756426-58-1	NE	ug/L	---	< 0.00093 J	< 0.00045	---	< 0.00096 J	< 0.00045	---	< 0.00094	< 0.00047	---	< 0.00097	< 0.00046	---	< 0.00094	< 0.00048	---	< 0.00095	< 0.00094	---	< 0.00092	< 0.00048	---	< 0.0035	< 0.00094
n-Ethyl perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) [PFAS-ID36]	2991-50-6	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037 J	< 0.0010
N-Ethylperfluorooctanesulfonamide (EtFOSAm) [PFAS-ID36]	4151-50-2	NE	ug/L	---	< 0.0010	< 0.00048 J	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051 J	---	< 0.0010	< 0.00049 J	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037 J	< 0.0010 J
N-Ethylperfluorooctanesulfonamidoethanol (EtFOSE) [PFAS-ID36]	1691-99-2	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051 J	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010
n-Methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA) [PFAS-ID36]	2355-31-9	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010 J	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010
N-Methylperfluorooctanesulfonamide (MeFOSA) [PFAS-ID36]	31506-32-8	NE	ug/L	---	< 0.0010	< 0.00048 J	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051 J	---	< 0.0010	< 0.00049 J	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010 J
N-Methylperfluorooctanesulfonamidoethanol (MeFOSE) [PFAS-ID36]	24448-09-7	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051 J	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010
Perfluorobutanesulfonate (PFBS)	45187-15-3	7	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluorobutanesulfonic acid [EPA 537M]	375-73-5	2	ug/L	< 0.00430	---	---	< 0.00420	---	---	**0.022**	---	---	< 0.0170	---	---	< 0.00440	---	---	< 0.00410	---	---	< 0.00430	---	---	< 0.0160	---	---
Perfluorobutanesulfonic acid [PFAS-ID36]	375-73-5	2	ug/L	---	**0.008**	**0.00682**	---	< 0.00091	**0.00257**	---	**0.017**	**0.0171**	---	**0.007**	**0.00557**	---	< 0.0009	**0.00883**	---	< 0.0009	**0.00255**	---	< 0.00087	**0.00343**	---	< 0.0033	**0.00237**
Perfluorobutanoic acid (PFBA)	375-22-4	7	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluorobutyric Acid [EPA 537M]	375-22-4	7	ug/L	**0.03**	---	---	**0.088**	---	---	**0.043**	---	---	< 0.0190	---	---	**0.076**	---	---	**0.075**	---	---	**0.016**	---	---	**0.098**	---	---
Perfluorobutyric Acid [PFAS-ID36]	375-22-4	7	ug/L	---	**0.025**	**0.0241**	---	**0.088**	**0.0741**	---	**0.043**	**0.0581 J**	---	**0.015**	**0.0133**	---	**0.059**	**0.0531**	---	**0.14**	**0.12**	---	**0.015**	**0.0147**	---	**0.078**	**0.0978**
Perfluorodecanesulfonic acid [PFAS-ID36]	335-77-3	NE	ug/L	---	< 0.00097	< 0.00046	---	< 0.00099 J	< 0.00047	---	< 0.00097 J	< 0.00049	---	< 0.0010	< 0.00048	---	< 0.00098	< 0.00050	---	< 0.00098	< 0.00098	---	< 0.00095	< 0.00049	---	< 0.0036	< 0.00097
Perfluorodecanoic acid [PFAS-ID36]	335-76-2	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010 J	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010 J	< 0.00052	---	< 0.0010 J	< 0.00101	---	< 0.00099 J	< 0.00051	---	< 0.0037	< 0.0010
Perfluorododecanesulfonic acid (PFDoS) [PFAS-ID36]	79780-39-5	NE	ug/L	---	< 0.00097	< 0.00046	---	< 0.0010	< 0.00047	---	< 0.00098 J	< 0.00049	---	< 0.0010	< 0.00048	---	< 0.00098	< 0.00050	---	< 0.00099	< 0.00098	---	< 0.00096	< 0.00049	---	< 0.0036 J	< 0.00097
Perfluorododecanoic acid [PFAS-ID36]	307-55-1	NE	ug/L	---	< 0.0010 J	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010 J	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010
Perfluoroheptanesulfonic acid [PFAS-ID36]	375-92-8	NE	ug/L	---	**0.0038**	**0.00404**	---	< 0.00098 J	< 0.00046	---	< 0.00096	< 0.00048	---	< 0.00099	< 0.00047	---	< 0.00096	< 0.00049	---	< 0.00097	< 0.00096	---	< 0.00094	**0.00113**	---	< 0.0035	< 0.00095
Perfluoroheptanoic acid [PFAS-ID36]	375-85-9	NE	ug/L	---	**0.0053**	**0.0039**	---	**0.0027**	**0.00185**	---	**0.0097**	**0.0096**	---	< 0.0010	**0.00064**	---	< 0.0010	< 0.00052	---	**0.0044**	**0.00345**	---	**0.0022**	**0.00165**	---	< 0.0037	**0.00326**
Perfluorohexadecanoic Acid (PFHXDA) [PFAS-ID36]	67905-19-5	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010 J	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	---	---	< 0.00099	---	---	< 0.0037	---
Perfluorohexanesulfonate (PFHxS)	108427-53-8	NE	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluorohexanesulfonic acid [EPA 537M] - PFHxS	355-46-4	0.047	ug/L	**0.10 J**	---	---	< 0.00420	---	---	**0.086**	---	---	< 0.0180	---	---	< 0.00470	---	---	< 0.00440	---	---	< 0.00460	---	---	< 0.0170	---	---
Perfluorohexanesulfonic acid [PFAS-ID36]	355-46-4	0.047	ug/L	**0.10 J**	**0.16**	**0.127**	< 0.00420	**0.0011**	**0.00081**	**0.086**	**0.11**	**0.0873**	< 0.0180	**0.0046**	**0.00374**	< 0.00470	< 0.00092	**0.00066**	< 0.00440	< 0.00093	< 0.00092	< 0.00460	**0.003**	**0.0282**	< 0.0170	< 0.0034	**0.00382**
Perfluorohexanoic acid (PFHxA)	307-24-4	NE	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluorohexanoic acid [EPA 537M]	307-24-4	NE	ug/L	**0.015**	---	---	**0.0081**	---	---	**0.049**	---	---	< 0.0190	---	---	< 0.0050	---	---	**0.0088**	---	---	**0.0093**	---	---	< 0.0180	---	---
Perfluorohexanoic acid [PFAS-ID36]	307-24-4	NE	ug/L	---	**0.014**	**0.0123 J**	---	**0.0071**	**0.00529**	---	**0.035**	**0.0443**	---	**0.0017**	**0.00139**	---	< 0.0010	< 0.00052	---	**0.011**	**0.00912**	---	**0.005**	**0.00432**	---	< 0.0037	**0.00731**
Perfluorononanesulfonic acid (PFNS) [PFAS-ID36]	68259-12-1	NE	ug/L	---	< 0.00096	< 0.00046	---	< 0.00099	< 0.00047	---	< 0.00097	< 0.00049	---	< 0.0010	< 0.00047	---	< 0.00097 J	< 0.00050	---	< 0.00098	< 0.00097	---	< 0.00095	< 0.00049	---	< 0.0036 J	< 0.00096
Perfluorononanoic acid [PFAS-ID36]	375-95-1	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010
Perfluorooctadecanoic Acid (PFOCDA) [PFAS-ID36]	16517-11-6	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	---	---	< 0.00099	---	---	< 0.0037	---
Perfluorooctanesulfonate (PFOS)	45298-90-6	0.027	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluorooctane Sulfonate [EPA 537M] - PFOS	1763-23-1	0.015	ug/L	**0.093 J**	---	---	< 0.00460	---	---	< 0.00470	---	---	**0.021**	---	---	< 0.00480	---	---	< 0.00450	---	---	**0.012**	---	---	< 0.0170	---	---
Perfluorooctane Sulfonate [PFAS-ID36]	1763-23-1	0.015	ug/L	**0.093 J**	**0.23**	**0.102**	< 0.00460	**0.00099**	**0.00118 J**	< 0.00470	**0.0019**	**0.00246 J**	**0.021**	**0.007 J**	**0.00562 J**	< 0.00480	< 0.00094	< 0.00048	< 0.00450	< 0.00094	**0.001 J**	**0.012**	**0.0066**	**0.0739**	< 0.0170	< 0.0034	**0.00705**
Perfluorooctanesulfonamide [PFAS-ID36]	754-91-6	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010
Perfluorooctanoic acid (PFOA)	335-67-1	0.035	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluorooctanoic acid [EPA 537M] - PFOA	335-67-1	0.035	ug/L	**0.021**	---	---	**0.012**	---	---	**0.067**	---	---	< 0.0190	---	---	< 0.0050	---	---	**0.006**	---	---	**0.011**	---	---	< 0.0180	---	---
Perfluorooctanoic acid [PFAS-ID36]	335-67-1	0.035	ug/L	**0.021**	**0.021**	**0.0193**	**0.012**	**0.011**	**0.011**	**0.067**	**0.061**	**0.0569**	< 0.0190	**0.0052**	**0.00528**	< 0.0050	< 0.0010	**0.00063**	**0.006**	**0.0065**	**0.0071**	**0.011**	**0.0089**	**0.00584**	< 0.0180	**0.0095**	**0.0723**
Perfluoropentanesulfonic acid (PFPeS) [PFAS-ID36]	2706-91-4	NE	ug/L	---	**0.0081**	**0.0063**	---	< 0.00097	< 0.00046	---	**0.011**	**0.0113**	---	**0.002**	**0.00177**	---	< 0.00095	< 0.00049	---	< 0.00096	< 0.00095	---	< 0.00093	**0.00245**	---	< 0.0035	**0.00108**
Perfluoropentanoic acid (PFPeA)	2706-90-3	NE	ug/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Perfluoropentanoic acid [EPA 537M]	2706-90-3	NE	ug/L	**0.011**	---	---	**0.012**	---	---	**0.013**	---	---	< 0.0190	---	---	< 0.0050	---	---	**0.011**	---	---	**0.0067**	---	---	< 0.0180	---	---
Perfluoropentanoic acid [PFAS-ID36]	2706-90-3	NE	ug/L	---	**0.0089**	**0.0085**	---	**0.013**	**0.00977**	---	**0.011**	**0.0138**	---	**0.0016**	**0.00144**	---	< 0.0010	< 0.00052	---	**0.017**	**0.0147**	---	**0.003**	**0.00419**	---	**0.0054**	**0.00866**
Perfluorotetradecanoic acid (PFTA / PFTeDA / PFTeA) [PFAS-ID36]	376-06-7	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010 J	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099 J	< 0.00051	---	< 0.0037	< 0.0010
Perfluorotridecanoic acid (PFTrDA / PFTrA) [PFAS-ID36]	72629-94-8	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037	< 0.0010
Perfluoroundecanoic acid [PFAS-ID36]	2058-94-8	NE	ug/L	---	< 0.0010	< 0.00048	---	< 0.0010 J	< 0.00049	---	< 0.0010	< 0.00051	---	< 0.0010 J	< 0.00049	---	< 0.0010	< 0.00052	---	< 0.0010 J	< 0.00101	---	< 0.00099	< 0.00051	---	< 0.0037 J	< 0.0010
PFOS + PFOA	NA	0.070[2]	ug/L	**0.114 J**	**0.251**	**0.1213**	**0.012**	**0.01199**	**0.01218**	**0.067**	**0.0629**	**0.05936 J**	**0.021**	**0.0122 J**	**0.0109 J**	---	---	**0.00063**	**0.017**	**0.0065**	**0.0081**	**0.023**	**0.0155**	**0.07974**	---	**0.0095**	**0.00705**

Notes:
Bolded data indicates a detectable amount of an analyte.
J flagged data indicates an estimated value.
A highlighted value indicates a detectable amount of an analyte which exceeds an action level.
An underlined value indicates a non-detectable amount of an analyte which value exceeds an action level.
NE indicates an action level has not been established for an analyte.
< = Not detected above laboratory reporting limit
µg/L = micrograms per liter
mg/L = milligrams per liter
pg/L = picograms per liter
pCi/L = picoCuries per liter
HRL = Minnesota Department of Health (MDH) Health Risk Limit
HBV = MDH Health-Based Value
RAA = MDH Risk Assessment Advice
[1]Results were compared to the lowest applicable MDH HRL, HBV, or RAA (published Feb. 4, 2021), or EPA MCL or HAL with no applicable MDH criteria
[2]US Environmental Protection Agency (USEPA) health advisory level for PFOS + PFOA (November 2016).
[4]Minnesota Class 2A water quality standard (designated for drinking water) for 2,3,7,8-TCDD Equivalent of 0.0014 pg/L
[5]USEPA maximum contaminant level (MCL) for Gross Alpha of 15 pCi/L
[6]USEPA MCL for Mercury is 0.002 mg/L
Blue shading = Result exceeds applicable screening criteria
--- = Value not analyzed/calculated

Table 5
Soil Gas Sample Results
SW27 Vadnais Heights Landfill
651 County Road F East
Vadnais Heights, MN
Bay West Job J200402

Sample Name		Residential ISVs[6] (µg/m³)	Residential 33X ISVs[6] (µg/m³)	Industrial ISVs[6] (µg/m³)	Industrial 33X ISVs[6] (µg/m³)	SW27-PSG33		SW27-PSG35	SW27-PSG36	SW27-PSG37
Sample Date						10/16/2020	3/12/2021	10/16/2020	10/16/2020	10/16/2020
VOCs EPA TO-15 (µg/m³)										
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	5200	170000	18000	600000	< 1.6	< 1.5	< 1.5	< 1.6	< 1.5
1,1,2,2-Tetrachloroethane	79-34-5	NE	NE	NE	NE	< 1.0	< 0.97	< 0.97	< 1.0	< 0.97
1,1,2-Trichlorotrifluoroethane (CFC-113)	76-13-1	5200	170000	18000	600000	**0.44J**	< 2.2	**0.54J**	**0.4J**	**0.34J**
1,1,2-Trichloroethane	79-00-5	0.21	7	0.7	23	< 0.8	< 0.77	< 0.77	< 0.8	< 0.77
1,1-Dichloroethane	75-34-3	NE	NE	NE	NE	< 1.2	< 1.1	< 1.1	< 1.2	< 1.1
1,1-Dichloroethene (DCE)	75-35-4	210	7000	700	23000	< 1.2	< 1.1	< 1.1	< 1.2	< 1.1
1,2,4-Trichlorobenzene	120-82-1	2.1	70	7	230	< 10.9	< 10.5	< 10.5	< 10.9	< 10.5
1,2,4-Trimethylbenzene	95-63-6	63	2100	210	7000	**1.0J**	**0.53J**	**0.3J**	**1.8**	**0.27J**
1,2-Dibromoethane (EDB)	106-93-4	0.017	0.57	0.16	5.3	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
1,2-Dichlorobenzene	95-50-1	NE	NE	NE	NE	< 1.8	< 1.7	< 1.7	< 1.8	< 1.7
1,2-Dichloroethane	107-06-2	0.39	13	3.8	130	< 0.59	< 1.1	< 0.57	< 0.59	< 0.57
1,2-Dichloropropane	78-87-5	2.7	90	14	470	< 1.4	< 1.3	< 1.3	< 1.4	< 1.3
1,3,5-Trimethylbenzene	108-67-8	63	2100	210	7000	**0.43J**	**0.32J**	< 1.4	**0.87J**	< 1.4
1,3-Butadiene	106-99-0	0.28	9.3	2.7	90	< 0.65	< 0.63	< 0.63	< 0.65	< 0.63
1,3-Dichlorobenzene	541-73-1	NE	NE	NE	NE	< 1.8	< 1.7	< 1.7	< 1.8	< 1.7
1,4-Dichlorobenzene	106-46-7	63	2100	210	7000	< 4.4	< 4.3	< 4.3	< 4.4	< 4.3
2-Butanone (MEK)	78-93-3	3100	100000	11000	370000	< 4.3	< 4.2	< 4.2	< 4.3	**2.1J**
2-Hexanone	591-78-6	31	1000	110	3700	< 6.0	< 5.8	< 5.8	< 6.0	< 5.8
2-Propanol (Isopropyl alcohol, Isopropanol)	67-63-0	210	7000	700	23000	< 3.6	**2.4J**	< 3.5	< 3.6	**2.4J**
4-Ethyltoluene	622-96-8	NE	NE	NE	NE	< 3.6	< 3.5	< 3.5	**0.54J**	< 3.5
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	108-10-1	3100	100000	11000	370000	**3.7J**	**0.23JB**	**1.4J**	**1.2J**	**1.8J**
Acetone	67-64-1	32000	1100000	110000	3700000	**16.6**	**9.0**	**11.3**	**10.4**	**11.9**
Benzene	71-43-2	1.3	43	11	370	**0.53**	**0.23J**	**0.49**	**0.99**	**0.36J**
Bromodichloromethane	75-27-4	21	700	70	2300	< 2.0	< 1.9	< 1.9	< 2.0	< 1.9
Bromoform	75-25-2	NE	NE	NE	NE	< 7.6	< 7.3	< 7.3	< 7.6	< 7.3
Bromomethane (Methyl bromide)	74-83-9	4.2	140	14	470	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Carbon disulfide	75-15-0	830	28000	2800	93000	**1.6**	< 0.88	< 0.88	**3.2**	< 0.88
Carbon tetrachloride	56-23-5	1.7	57	16	530	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chlorobenzene	108-90-7	52	1700	180	6000	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Chloroethane (Ethyl chloride)	75-00-3	4200	140000	14000	470000	< 0.77	< 0.75	< 0.75	< 0.77	< 0.75
Chloroform	67-66-3	100	3300	350	12000	< 0.71	< 1.4	< 0.69	< 0.71	**0.78**
Chloromethane (Methyl chloride)	74-87-3	94	3100	320	11000	< 0.6	**0.44J**	**0.57J**	< 0.6	< 0.58
Chloromethylbenzene	100-44-7	0.21	7	2	67	< 3.8	< 3.7	< 3.7	< 3.8	< 3.7
cis-1,2-Dichloroethene	156-59-2	NE	NE	NE	NE	< 1.2	< 1.1	< 1.1	< 1.2	< 1.1
cis-1,3-Dichloropropene	10061-01-5	2.5	83	25	830	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Cyclohexane	110-82-7	6300	210000	21000	700000	**1.8J**	**1.0J**	**0.59J**	**0.96J**	**0.68J**
Dibromochloromethane	124-48-1	NE	NE	NE	NE	< 2.5	< 2.4	< 2.4	< 2.5	< 2.4
Dichlorodifluoromethane (Freon 12)	75-71-8	NE	NE	NE	NE	**2.4**	**2.6**	**2.7**	**2.4**	**2.3**
Dichlorotetrafluoroethane	76-14-2	NE	NE	NE	NE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethanol	64-17-5	NE	NE	NE	NE	**7.6**	**5.5**	**13.1**	**4.4**	**9.7**
Ethyl acetate	141-78-6	73	2400	250	8300	< 1.1	< 1.0	< 1.0	< 1.1	< 1.0
Ethylbenzene	100-41-4	4.1	140	39	1300	**1.1J**	**1.2J**	**0.5J**	**1.7**	**0.62J**
Hexachlorobutadiene	87-68-3	NE	NE	NE	NE	< 7.8	< 7.5	< 7.5	< 7.8	< 7.5
Methane (ppmv)	74-82-8	EPA Action Level = 5,000 ppm (0.5%)				< 72.0	< 27.8	< 69.5	**61.2J**	< 69.5
Methyl-tert-butyl ether (MTBE)	1634-04-4	39	1300	380	13000	< 5.3	< 5.1	< 5.1	< 5.3	< 5.1
Methylene Chloride (Dichloromethane)	75-09-2	630	21000	2100	70000	**4.3J**	< 4.9	< 4.9	**2.6J**	**2.8J**
m-Xylene & p-Xylene	179601-23-1	NE	NE	NE	NE	**3.0**	**3.9**	**1.7J**	**6.3**	**1.9J**
Naphthalene	91-20-3	9.4	310	32	1100	< 3.8	< 3.7	< 3.7	< 3.8	< 3.7
n-Heptane	142-82-5	420	14000	1400	47000	< 1.2	< 1.2	< 1.2	< 1.2	**0.53J**
n-Hexane	110-54-3	730	24000	2500	83000	**2.8**	**0.37J**	**1.3**	**1.6**	**1.4**
Oxygen (%)	7782-44-7	NE				**15.4**	**18.8**	**19.7**	**16.5**	**11.9**
o-Xylene	95-47-6	100	3300	350	12000	**0.79J**	**1.1J**	**0.45J**	**2.2**	**0.5J**
Propylene (Methylethylene)	115-07-1	3100	100000	11000	370000	**3.3**	**3.9**	< 0.49	< 0.5	**2.8**
Styrene	100-42-5	940	31000	3200	110000	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Tetrachloroethylene (PCE)	127-18-4	3.4	110	33	1100	< 0.99	< 0.96	< 0.96	< 0.99	< 0.96
Tetrahydrofuran	109-99-9	2100	70000	7000	230000	**3.8**	**8.0**	**6.6**	**3.9**	**5.8**
Toluene (Methylbenzene)	108-88-3	4200	140000	14000	470000	**4.3**	**30.7**	**3.0**	**9.8**	**3.5**
trans-1,2-Dichloroethene	156-60-5	21	700	70	2300	< 1.2	< 1.1	< 1.1	< 1.2	< 1.1
trans-1,3-Dichloropropene	10061-02-6	2.5	83	25	830	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Trichloroethylene (TCE)	79-01-6	2.1	70	7	230	< 0.79	< 0.76	< 0.76	< 0.79	< 0.76
Trichlorofluoromethane (Freon 11)	75-69-4	1000	33000	3500	120000	< 1.6	**0.47J**	**1.3J**	< 1.6	< 1.6
Vinyl acetate	108-05-4	210	7000	700	23000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	75-01-4	1.7	57	22	730	< 0.37	< 0.36	< 0.36	< 0.37	< 0.36

Notes:
µg/m³ = micrograms per cubic meter
ppmv = parts per million by volume
% = percent of sample
< = Result is less than the laboratory reporting limit
MPCA = Minnesota Pollution Control Agency
Residential ISV = MPCA Residential Intrusion Screening Value, published January 22, 2021
Industrial ISV = MPCA Industrial Intrusion Screening Value, published January 22, 2021
Bold = Detected result
Grey - Result exceeds the Residential ISV
Orange - Result exceeds the Residential 33X ISV
Green - Result exceeds the Industrial ISV
Light Blue - Result exceeds the Industrial 33X ISV
Red - Result exceeds EPA Action Level for methane
J = Estimated result
B = Result associated with field or laboratory blank contamination

Table 6

Quarterly Landfill Gas Monitoring Results
SW27 Vadnais Heights Landfill
651 County Raod F East
Vadnais Heights, MN
Bay West Job J200402

Location	Parameter	Date						
		1/23/2019	4/4/2019	9/26/2019	12/18/2019	2/19/2020	5/20/2020	3/5/2021
Event/City Center								
Roof Vents	CH4%	0	0	0	0	0	0	0
	O2%	20.8	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.06	0.06	0.02	0.02	0.02	0.02	0.02
	%LEL (ppm)	0	0	0	0.2	0.2	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Exterior	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.02	0.06	0	0.2	0.2	0	0.02
	%LEL (ppm)	-	0	0	0.5	0.3	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Entrance	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.08	0.02	0	0.02	0.02	0.02	0.02
	%LEL (ppm)	-	0	0	0.6	0.7	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Bathrooms	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.02	0.02	0.02	0.06	0.02	0.02	0.02
	%LEL (ppm)	-	0	0	0.6	0.7	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Closets	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.04	0.06	0.02	0.02	0	0.04	0.02
	%LEL (ppm)	-	0	0	0.4	0.5	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Meeting Rooms	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.02	0.06	0.02	0.04	0.02	0.02	0.02
	%LEL (ppm)	-	0	0	1.1	0.5	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-

Table 6

Quarterly Landfill Gas Monitoring Results
SW27 Vadnais Heights Landfill
651 County Raod F East
Vadnais Heights, MN
Bay West Job J200402

Location	Parameter	Date						
		1/23/2019	4/4/2019	9/26/2019	12/18/2019	2/19/2020	5/20/2020	3/5/2021
Event/City Center								
Kitchen	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.02	0.06	0.02	0.02	0.02	0.02	0.02
	%LEL (ppm)	-	0	0	0.4	0.3	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Main Gathering Area	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.02	0.04	0.02	0	0	0.02	0.02
	%LEL (ppm)	-	0	0	0.4	0.6	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Warming House								
Location	Parameter	Date						
		1/23/2019	4/4/2019	9/26/2019	12/18/2019	2/19/2020	5/20/2020	3/5/2021
Warming House	CH4%	0	0	0	0	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.02	0.04	0.04	0.02	0	0.02	0.02
	%LEL (ppm)	0	0	0	0.6	0.5	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-
Concession Stand Building								
Location	Parameter	Date						
		1/23/2019	4/4/2019	9/26/2019	12/18/2019	2/19/2020	5/20/2020	3/5/2021
Concession Stand Building	CH4%	0.03	0	0	0.02	0	0	0
	O2%	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	CO2%	0.05	0.06	0.02	0.02	0	0.04	0.02
	%LEL (ppm)	0	0	0	0.4	0.3	0	0
	H2S (ppm)	0	0	0	0	0	0	0
	CO (ppm)	-	-	-	-	-	-	-

Notes:

- = Not Collected
% = percent
CH4 = Methane
CO = Carbon monoxide
CO2 = Carbon dioxide
H2S = Hydrogen sulfide
LEL = Lower Explosive Limit
O2 = Oxygen
ppm = parts per million

Appendix A

Investigation-Derived Waste

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

October 28, 2020

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Lynch
colin.lynch@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Pace Analytical Services - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Massachusetts DWP Certification #: via MN 027-053-137
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10535889001	**IDW01 TCLP**	Solid	10/16/20 13:00	10/16/20 13:55

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10535889001	**IDW01 TCLP**	EPA 8081B	RAG	9
		EPA 6010D	IP	7
		EPA 7470A	LMW	1
		EPA 8270E	MS4	18
		EPA 8260D	MM3	14

PASI-M = Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8081B**
Description: 8081B GCS Pesticides, TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 8081B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA Mod. 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 705526

S0: Surrogate recovery outside laboratory control limits.

- MS (Lab ID: 3769279)
  - Tetrachloro-m-xylene (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 705526

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10535889001

R1: RPD value was outside control limits.

- MSD (Lab ID: 3769280)
  - Heptachlor

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8081B**
Description: 8081B GCS Pesticides, TCLP
Client: Bay West LLC
Date: October 28, 2020

Analyte Comments:

QC Batch: 705526

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- IDW01 TCLP (Lab ID: 10535889001)
  - Tetrachloro-m-xylene (S)
- MS (Lab ID: 3769279)
  - Tetrachloro-m-xylene (S)
- MSD (Lab ID: 3769280)
  - Tetrachloro-m-xylene (S)

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 6010D**
Description: 6010D MET ICP, TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 6010D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010A with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 705501

B: Analyte was detected in the associated method blank.

- LB for HBN 705145 [TCLP/10302] (Lab ID: 3767812)
  - Chromium

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 7470A**
Description: 7470A Mercury, TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 7470A by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8270E**
Description: 8270E MSSV TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 8270E by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 705494

S0: Surrogate recovery outside laboratory control limits.

- LCS (Lab ID: 3769114)
  - 2-Fluorophenol (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 705494

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10535367001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 3769115)
  - Pyridine

Additional Comments:

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8260D**
Description: 8260D MSV TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 8260D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Sample: IDW01 TCLP **Lab ID: 10535889001** Collected: 10/16/20 13:00 Received: 10/16/20 13:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides, TCLP	Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C Leachate Method/Date: EPA 1311; 10/20/20 09:22 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
gamma-BHC (Lindane)	**<2.5**	ug/L	2.5	0.033	5	10/20/20 14:18	10/23/20 04:52	58-89-9	
Chlordane (Technical)	**<25.0**	ug/L	25.0	1.1	5	10/20/20 14:18	10/23/20 04:52	57-74-9	
Endrin	**<5.0**	ug/L	5.0	0.10	5	10/20/20 14:18	10/23/20 04:52	72-20-8	
Heptachlor	**<2.5**	ug/L	2.5	0.047	5	10/20/20 14:18	10/23/20 04:52	76-44-8	R1
Heptachlor epoxide	**<2.5**	ug/L	2.5	0.037	5	10/20/20 14:18	10/23/20 04:52	1024-57-3	
Methoxychlor	**<25.0**	ug/L	25.0	0.86	5	10/20/20 14:18	10/23/20 04:52	72-43-5	
Toxaphene	**<75.0**	ug/L	75.0	2.3	5	10/20/20 14:18	10/23/20 04:52	8001-35-2	
Surrogates									
Tetrachloro-m-xylene (S)	86	%.	74-125		5	10/20/20 14:18	10/23/20 04:52	877-09-8	D3
Decachlorobiphenyl (S)	97	%.	58-136		5	10/20/20 14:18	10/23/20 04:52	2051-24-3	
6010D MET ICP, TCLP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Leachate Method/Date: EPA 1311; 10/19/20 13:32 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
Arsenic	**<0.50**	mg/L	0.50	0.019	1	10/20/20 11:46	10/21/20 09:53	7440-38-2	
Barium	**0.91J**	mg/L	1.0	0.0033	1	10/20/20 11:46	10/21/20 09:53	7440-39-3	
Cadmium	**<0.050**	mg/L	0.050	0.0016	1	10/20/20 11:46	10/21/20 09:53	7440-43-9	
Chromium	**0.0036J**	mg/L	0.50	0.0033	1	10/20/20 11:46	10/21/20 09:53	7440-47-3	B
Lead	**0.015J**	mg/L	0.50	0.0098	1	10/20/20 11:46	10/21/20 09:53	7439-92-1	
Selenium	**<0.10**	mg/L	0.10	0.029	1	10/20/20 11:46	10/21/20 09:53	7782-49-2	
Silver	**<0.10**	mg/L	0.10	0.0029	1	10/20/20 11:46	10/21/20 09:53	7440-22-4	
7470A Mercury, TCLP	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Leachate Method/Date: EPA 1311; 10/19/20 13:32 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
Mercury	**<0.60**	ug/L	0.60	0.24	1	10/20/20 12:32	10/21/20 14:52	7439-97-6	
8270E MSSV TCLP	Analytical Method: EPA 8270E Preparation Method: EPA 3510C Leachate Method/Date: EPA 1311; 10/20/20 09:22 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
1,4-Dichlorobenzene	**<100**	ug/L	100	19.6	1	10/20/20 14:22	10/21/20 17:39	106-46-7	
2,4-Dinitrotoluene	**<100**	ug/L	100	16.3	1	10/20/20 14:22	10/21/20 17:39	121-14-2	
Hexachloro-1,3-butadiene	**<100**	ug/L	100	23.1	1	10/20/20 14:22	10/21/20 17:39	87-68-3	
Hexachlorobenzene	**<100**	ug/L	100	12.7	1	10/20/20 14:22	10/21/20 17:39	118-74-1	
Hexachloroethane	**<100**	ug/L	100	37.0	1	10/20/20 14:22	10/21/20 17:39	67-72-1	
2-Methylphenol(o-Cresol)	**<100**	ug/L	100	13.9	1	10/20/20 14:22	10/21/20 17:39	95-48-7	
3&4-Methylphenol(m&p Cresol)	**<100**	ug/L	100	14.8	1	10/20/20 14:22	10/21/20 17:39		
Nitrobenzene	**<100**	ug/L	100	16.5	1	10/20/20 14:22	10/21/20 17:39	98-95-3	
Pentachlorophenol	**<200**	ug/L	200	58.9	1	10/20/20 14:22	10/21/20 17:39	87-86-5	
Pyridine	**<100**	ug/L	100	19.5	1	10/20/20 14:22	10/21/20 17:39	110-86-1	
2,4,5-Trichlorophenol	**<100**	ug/L	100	8.6	1	10/20/20 14:22	10/21/20 17:39	95-95-4	
2,4,6-Trichlorophenol	**<100**	ug/L	100	10.1	1	10/20/20 14:22	10/21/20 17:39	88-06-2	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Sample: IDW01 TCLP **Lab ID: 10535889001** Collected: 10/16/20 13:00 Received: 10/16/20 13:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E MSSV TCLP	Analytical Method: EPA 8270E Preparation Method: EPA 3510C								
	Leachate Method/Date: EPA 1311; 10/20/20 09:22 Initial pH: 9.59; Final pH: 2.23								
	Pace Analytical Services - Minneapolis								
Surrogates									
Nitrobenzene-d5 (S)	75	%.	41-125		1	10/20/20 14:22	10/21/20 17:39	4165-60-0	
2-Fluorobiphenyl (S)	65	%.	38-125		1	10/20/20 14:22	10/21/20 17:39	321-60-8	
p-Terphenyl-d14 (S)	86	%.	69-125		1	10/20/20 14:22	10/21/20 17:39	1718-51-0	
Phenol-d6 (S)	22	%.	10-125		1	10/20/20 14:22	10/21/20 17:39	13127-88-3	
2-Fluorophenol (S)	35	%.	30-125		1	10/20/20 14:22	10/21/20 17:39	367-12-4	
2,4,6-Tribromophenol (S)	79	%.	57-125		1	10/20/20 14:22	10/21/20 17:39	118-79-6	
8260D MSV TCLP	Analytical Method: EPA 8260D Leachate Method/Date: EPA 1311; 10/20/20 14:01								
	Pace Analytical Services - Minneapolis								
Benzene	**<25.0**	ug/L	25.0	3.0	1		10/22/20 19:49	71-43-2	
2-Butanone (MEK)	**48.7J**	ug/L	125	22.1	1		10/22/20 19:49	78-93-3	
Carbon tetrachloride	**<25.0**	ug/L	25.0	4.2	1		10/22/20 19:49	56-23-5	v2
Chlorobenzene	**<25.0**	ug/L	25.0	1.9	1		10/22/20 19:49	108-90-7	
Chloroform	**<25.0**	ug/L	25.0	12.1	1		10/22/20 19:49	67-66-3	
1,4-Dichlorobenzene	**<25.0**	ug/L	25.0	2.0	1		10/22/20 19:49	106-46-7	
1,2-Dichloroethane	**<25.0**	ug/L	25.0	6.4	1		10/22/20 19:49	107-06-2	
1,1-Dichloroethene	**<25.0**	ug/L	25.0	3.2	1		10/22/20 19:49	75-35-4	v2
Tetrachloroethene	**<25.0**	ug/L	25.0	4.4	1		10/22/20 19:49	127-18-4	
Trichloroethene	**<10.0**	ug/L	10.0	3.7	1		10/22/20 19:49	79-01-6	
Vinyl chloride	**<5.0**	ug/L	5.0	2.5	1		10/22/20 19:49	75-01-4	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		10/22/20 19:49	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		10/22/20 19:49	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		10/22/20 19:49	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705498
QC Batch Method: EPA 7470A
Analysis Method: EPA 7470A
Analysis Description: 7470A Mercury TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3769133 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.60	0.60	0.24	10/21/20 14:59	

METHOD BLANK: 3767812 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.60	0.60	0.24	10/21/20 14:55	

METHOD BLANK: 3767813 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.60	0.60	0.24	10/21/20 14:57	

LABORATORY CONTROL SAMPLE: 3769134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	15	15.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769135 3769136

Parameter	Units	12152364001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	15	15	14.9	15.0	100	100	80-120	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705501
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010D TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3769144 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.50	0.50	0.019	10/21/20 08:51	
Barium	mg/L	0.0054J	1.0	0.0033	10/21/20 08:51	
Cadmium	mg/L	<0.050	0.050	0.0016	10/21/20 08:51	
Chromium	mg/L	<0.50	0.50	0.0033	10/21/20 08:51	
Lead	mg/L	<0.50	0.50	0.0098	10/21/20 08:51	
Selenium	mg/L	<0.10	0.10	0.029	10/21/20 08:51	
Silver	mg/L	<0.10	0.10	0.0029	10/21/20 08:51	

METHOD BLANK: 3767812 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.50	0.50	0.019	10/21/20 08:54	
Barium	mg/L	0.0053J	1.0	0.0033	10/21/20 08:54	
Cadmium	mg/L	<0.050	0.050	0.0016	10/21/20 08:54	
Chromium	mg/L	0.0033J	0.50	0.0033	10/21/20 08:54	
Lead	mg/L	<0.50	0.50	0.0098	10/21/20 08:54	
Selenium	mg/L	<0.10	0.10	0.029	10/21/20 08:54	
Silver	mg/L	<0.10	0.10	0.0029	10/21/20 08:54	

METHOD BLANK: 3767813 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.50	0.50	0.019	10/21/20 08:56	
Barium	mg/L	0.0039J	1.0	0.0033	10/21/20 08:56	
Cadmium	mg/L	<0.050	0.050	0.0016	10/21/20 08:56	
Chromium	mg/L	<0.50	0.50	0.0033	10/21/20 08:56	
Lead	mg/L	<0.50	0.50	0.0098	10/21/20 08:56	
Selenium	mg/L	<0.10	0.10	0.029	10/21/20 08:56	
Silver	mg/L	<0.10	0.10	0.0029	10/21/20 08:56	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

LABORATORY CONTROL SAMPLE: 3769145

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	5	4.8	95	80-120	
Barium	mg/L	5	4.9	97	80-120	
Cadmium	mg/L	5	4.8	97	80-120	
Chromium	mg/L	5	4.8	96	80-120	
Lead	mg/L	5	4.7	95	80-120	
Selenium	mg/L	5	4.8	97	80-120	
Silver	mg/L	2.5	2.4	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769146 3769147

Parameter	Units	10535800001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	<500 ug/L	5	5	4.9	4.9	98	98	75-125	1	20	
Barium	mg/L	<1000 ug/L	5	5	5.4	5.4	99	98	75-125	1	20	
Cadmium	mg/L	<0.050	5	5	4.9	4.9	99	98	75-125	1	20	
Chromium	mg/L	<500 ug/L	5	5	4.9	4.9	98	97	75-125	1	20	
Lead	mg/L	<0.50	5	5	4.8	4.8	95	95	75-125	0	20	
Selenium	mg/L	<100 ug/L	5	5	5.0	4.9	99	99	75-125	1	20	
Silver	mg/L	<100 ug/L	2.5	2.5	2.4	2.5	98	98	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 706218
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3772706 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1-Dichloroethene	ug/L	<25.0	25.0	3.2	10/22/20 18:41	v2
1,2-Dichloroethane	ug/L	<25.0	25.0	6.4	10/22/20 18:41	
1,4-Dichlorobenzene	ug/L	<25.0	25.0	2.0	10/22/20 18:41	
2-Butanone (MEK)	ug/L	<125	125	22.1	10/22/20 18:41	
Benzene	ug/L	<25.0	25.0	3.0	10/22/20 18:41	
Carbon tetrachloride	ug/L	<25.0	25.0	4.2	10/22/20 18:41	v2
Chlorobenzene	ug/L	<25.0	25.0	1.9	10/22/20 18:41	
Chloroform	ug/L	<25.0	25.0	12.1	10/22/20 18:41	
Tetrachloroethene	ug/L	<25.0	25.0	4.4	10/22/20 18:41	
Trichloroethene	ug/L	<10.0	10.0	3.7	10/22/20 18:41	
Vinyl chloride	ug/L	<5.0	5.0	2.5	10/22/20 18:41	
1,2-Dichloroethane-d4 (S)	%.	92	75-125		10/22/20 18:41	
4-Bromofluorobenzene (S)	%.	98	75-125		10/22/20 18:41	
Toluene-d8 (S)	%.	98	75-125		10/22/20 18:41	

METHOD BLANK: 3768790 Matrix: Solid
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1-Dichloroethene	ug/L	<25.0	25.0	3.2	10/22/20 18:41	v2
1,2-Dichloroethane	ug/L	<25.0	25.0	6.4	10/22/20 18:41	
1,4-Dichlorobenzene	ug/L	<25.0	25.0	2.0	10/22/20 18:41	
2-Butanone (MEK)	ug/L	<125	125	22.1	10/22/20 18:41	
Benzene	ug/L	<25.0	25.0	3.0	10/22/20 18:41	
Carbon tetrachloride	ug/L	<25.0	25.0	4.2	10/22/20 18:41	v2
Chlorobenzene	ug/L	<25.0	25.0	1.9	10/22/20 18:41	
Chloroform	ug/L	<25.0	25.0	12.1	10/22/20 18:41	
Tetrachloroethene	ug/L	<25.0	25.0	4.4	10/22/20 18:41	
Trichloroethene	ug/L	<10.0	10.0	3.7	10/22/20 18:41	
Vinyl chloride	ug/L	<5.0	5.0	2.5	10/22/20 18:41	
1,2-Dichloroethane-d4 (S)	%.	92	75-125		10/22/20 18:41	
4-Bromofluorobenzene (S)	%.	98	75-125		10/22/20 18:41	
Toluene-d8 (S)	%.	98	75-125		10/22/20 18:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

LABORATORY CONTROL SAMPLE: 3772707

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/L	500	339	68	58-131	v3
1,2-Dichloroethane	ug/L	500	405	81	69-125	
1,4-Dichlorobenzene	ug/L	500	512	102	75-125	
2-Butanone (MEK)	ug/L	2500	2060	82	54-125	
Benzene	ug/L	500	398	80	69-125	
Carbon tetrachloride	ug/L	500	358	72	68-128	v3
Chlorobenzene	ug/L	500	483	97	71-136	
Chloroform	ug/L	500	406	81	70-125	
Tetrachloroethene	ug/L	500	460	92	70-126	
Trichloroethene	ug/L	500	440	88	73-127	
Vinyl chloride	ug/L	500	469	94	59-136	
1,2-Dichloroethane-d4 (S)	%.			90	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			99	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3772708 3772709

Parameter	Units	10535367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1-Dichloroethene	ug/L	ND	500	500	370	359	74	72	61-136	3	30	v3
1,2-Dichloroethane	ug/L	ND	500	500	437	433	87	87	68-125	1	30	
1,4-Dichlorobenzene	ug/L	ND	500	500	551	542	110	108	75-125	2	30	
2-Butanone (MEK)	ug/L	ND	2500	2500	2040	2060	82	82	39-150	1	30	
Benzene	ug/L	ND	500	500	436	429	87	85	67-130	2	30	
Carbon tetrachloride	ug/L	ND	500	500	399	397	80	79	68-133	0	30	v3
Chlorobenzene	ug/L	ND	500	500	526	520	105	104	75-125	1	30	
Chloroform	ug/L	ND	500	500	440	442	87	87	70-125	0	30	
Tetrachloroethene	ug/L	ND	500	500	503	495	101	99	73-134	2	30	
Trichloroethene	ug/L	ND	500	500	476	470	95	94	72-139	1	30	
Vinyl chloride	ug/L	ND	500	500	518	506	104	101	69-132	2	30	
1,2-Dichloroethane-d4 (S)	%.						91	91	75-125			
4-Bromofluorobenzene (S)	%.						97	98	75-125			
Toluene-d8 (S)	%.						100	100	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705526
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8081B
Analysis Description: 8081 GCS Pesticides, TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3769277 Matrix: Solid
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlordane (Technical)	ug/L	<5.0	5.0	0.21	10/23/20 03:00	
Endrin	ug/L	<1.0	1.0	0.021	10/23/20 03:00	
gamma-BHC (Lindane)	ug/L	<0.50	0.50	0.0066	10/23/20 03:00	
Heptachlor	ug/L	<0.50	0.50	0.0095	10/23/20 03:00	
Heptachlor epoxide	ug/L	<0.50	0.50	0.0073	10/23/20 03:00	
Methoxychlor	ug/L	<5.0	5.0	0.17	10/23/20 03:00	
Toxaphene	ug/L	<15.0	15.0	0.45	10/23/20 03:00	
Decachlorobiphenyl (S)	%.	98	58-136		10/23/20 03:00	
Tetrachloro-m-xylene (S)	%.	93	74-125		10/23/20 03:00	

LABORATORY CONTROL SAMPLE: 3769278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/L	10	9.7	97	69-138	
gamma-BHC (Lindane)	ug/L	5	4.7	95	68-135	
Heptachlor	ug/L	5	4.3	86	60-131	
Heptachlor epoxide	ug/L	5	4.6	93	68-133	
Methoxychlor	ug/L	50	49.5	99	63-144	
Decachlorobiphenyl (S)	%.			108	58-136	
Tetrachloro-m-xylene (S)	%.			96	74-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769279 3769280

Parameter	Units	10535889001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endrin	ug/L	<5.0	10	10	8.1	8.4	81	84	66-136	3	20	
gamma-BHC (Lindane)	ug/L	<2.5	5	5	3.9	4.1	78	82	64-131	5	20	
Heptachlor	ug/L	<2.5	5	5	2.9	4.2	59	83	48-140	35	20	R1
Heptachlor epoxide	ug/L	<2.5	5	5	4.5	4.7	90	95	70-140	5	20	
Methoxychlor	ug/L	<25.0	50	50	41.4	43.3	83	87	45-150	5	20	
Decachlorobiphenyl (S)	%.						110	111	58-136			
Tetrachloro-m-xylene (S)	%.						53	94	74-125			D3,S0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705494
QC Batch Method: EPA 3510C
Analysis Method: EPA 8270E
Analysis Description: 8270E TCLP MSSV
Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10535889001

METHOD BLANK: 3769113 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dichlorobenzene	ug/L	<100	100	19.6	10/21/20 13:55	
2,4,5-Trichlorophenol	ug/L	<100	100	8.6	10/21/20 13:55	
2,4,6-Trichlorophenol	ug/L	<100	100	10.1	10/21/20 13:55	
2,4-Dinitrotoluene	ug/L	<100	100	16.3	10/21/20 13:55	
2-Methylphenol(o-Cresol)	ug/L	<100	100	13.9	10/21/20 13:55	
3&4-Methylphenol(m&p Cresol)	ug/L	<100	100	14.8	10/21/20 13:55	
Hexachloro-1,3-butadiene	ug/L	<100	100	23.1	10/21/20 13:55	
Hexachlorobenzene	ug/L	<100	100	12.7	10/21/20 13:55	
Hexachloroethane	ug/L	<100	100	37.0	10/21/20 13:55	
Nitrobenzene	ug/L	<100	100	16.5	10/21/20 13:55	
Pentachlorophenol	ug/L	<200	200	58.9	10/21/20 13:55	
Pyridine	ug/L	<100	100	19.5	10/21/20 13:55	
2,4,6-Tribromophenol (S)	%.	76	57-125		10/21/20 13:55	
2-Fluorobiphenyl (S)	%.	62	38-125		10/21/20 13:55	
2-Fluorophenol (S)	%.	31	30-125		10/21/20 13:55	
Nitrobenzene-d5 (S)	%.	71	41-125		10/21/20 13:55	
p-Terphenyl-d14 (S)	%.	85	69-125		10/21/20 13:55	
Phenol-d6 (S)	%.	20	10-125		10/21/20 13:55	

LABORATORY CONTROL SAMPLE: 3769114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	500	246	49	30-125	
2,4,5-Trichlorophenol	ug/L	500	363	73	65-125	
2,4,6-Trichlorophenol	ug/L	500	358	72	64-125	
2,4-Dinitrotoluene	ug/L	500	396	79	60-125	
2-Methylphenol(o-Cresol)	ug/L	500	226	45	45-125	
3&4-Methylphenol(m&p Cresol)	ug/L	500	203	41	37-125	
Hexachloro-1,3-butadiene	ug/L	500	212	42	30-125	
Hexachlorobenzene	ug/L	500	390	78	67-125	
Hexachloroethane	ug/L	500	207	41	30-125	
Nitrobenzene	ug/L	500	360	72	57-125	
Pentachlorophenol	ug/L	500	373	75	40-125	
Pyridine	ug/L	500	160	32	30-125	
2,4,6-Tribromophenol (S)	%.			75	57-125	
2-Fluorobiphenyl (S)	%.			66	38-125	
2-Fluorophenol (S)	%.			28	30-125	S0
Nitrobenzene-d5 (S)	%.			71	41-125	
p-Terphenyl-d14 (S)	%.			79	69-125	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

LABORATORY CONTROL SAMPLE: 3769114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenol-d6 (S)	%.			18	10-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769115 3769116

Parameter	Units	10535367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dichlorobenzene	ug/L	ND	500	500	259	272	52	54	30-125	5	30	
2,4,5-Trichlorophenol	ug/L	ND	500	500	414	407	83	81	57-125	2	30	
2,4,6-Trichlorophenol	ug/L	ND	500	500	415	411	83	82	58-125	1	30	
2,4-Dinitrotoluene	ug/L	ND	500	500	423	418	85	84	57-125	1	30	
2-Methylphenol(o-Cresol)	ug/L	ND	500	500	258	261	52	52	34-125	1	30	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	500	500	240	238	48	48	31-125	1	30	
Hexachloro-1,3-butadiene	ug/L	ND	500	500	232	249	46	50	30-125	7	30	
Hexachlorobenzene	ug/L	ND	500	500	441	442	88	88	62-125	0	30	
Hexachloroethane	ug/L	ND	500	500	210	227	42	45	30-125	8	30	
Nitrobenzene	ug/L	ND	500	500	361	380	72	76	52-125	5	30	
Pentachlorophenol	ug/L	ND	500	500	473	482	95	96	30-130	2	30	
Pyridine	ug/L	ND	500	500	147	163	29	33	30-125	10	30	M1
2,4,6-Tribromophenol (S)	%.						94	93	57-125			
2-Fluorobiphenyl (S)	%.						75	75	38-125			
2-Fluorophenol (S)	%.						37	36	30-125			
Nitrobenzene-d5 (S)	%.						74	76	41-125			
p-Terphenyl-d14 (S)	%.						88	87	69-125			
Phenol-d6 (S)	%.						24	24	10-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
v2	The continuing calibration verification was below the method acceptance limit. The analyte was not detected in the associated samples and the sensitivity of the instrument was verified with a reporting limit check standard.
v3	The continuing calibration verification was below the method acceptance limit. Any detection for the analyte in the associated samples may have a low bias.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10535889001	**IDW01 TCLP**	EPA Mod. 3510C	705526	EPA 8081B	706206
10535889001	**IDW01 TCLP**	EPA 3010A	705501	EPA 6010D	705682
10535889001	**IDW01 TCLP**	EPA 7470A	705498	EPA 7470A	705616
10535889001	**IDW01 TCLP**	EPA 3510C	705494	EPA 8270E	705879
10535889001	**IDW01 TCLP**	EPA 8260D	706218		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information		Section E — MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Number	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:	tharsch@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: none	none	none	none	Requested Analysis: TCLP Semivolatiles (EPA 8270D/1311)	TCLP Metals (RCRA) - (EPA 6010C, 1311, 7470)	TCLP Pesticides (EPA 8081B/1311)	TCLP VOCs (EPA 8260B/1311)	Comments
1	~~IDW01 TCLP~~ IDW01 TCLP		Sample	G	SO	SD	Soil-Sub	101620	~~1130~~ 1300	4	X	X	X	X					001
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

WO# : 10535889

10535889

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Kay Colter BayWest	10/16/20	13:55	[signature]	10-16-20	1355	1-2

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: [signature]

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/16/20

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10535889

PM: CL1 Due Date: 10/30/20

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☒T5(0489) **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.1 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 1.2 °C

USDA Regulated Soil: (☒N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☒No

Date/Initials of Person Examining Contents: 10/16/20 JN

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☒No CL1 10/19/20

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		8.
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☐Water ☒Soil ☐Oil ☐Other_____	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☒N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 10/19/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: MKL (2)

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	NONHAZARDOUS	1	3E: 800-451-8346	J200402-SRR

GENERATOR

5. Generator's Name and Mailing Address
MPCA-SW27 Vadnais Heights
520 Lafayette Road
St. Paul, MN 55155
Generator's Phone 651-757-2308

Generator's Site Address (if different than mailing address)
MPCA-SW#27
641 County Road F East
Vadnais Heights, MN 55127

6. Transporter 1 Company Name
BAY WEST LLC
U.S. EPA ID Number
MND982205437

7. Transporter 2 Company Name
Veolia ES Technical Solutions-NJ
U.S. EPA ID Number
NJD080631369

8. Designated Facility Name and Site Address
Veolia ES Technical Solutions - SRR
4301 Infirmary Road
West Carrollton, OH 45449
Facility's Phone: 937-859-6101
U.S. EPA ID Number
OHD093945293

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1	Non DOT, Non RCRA Hazardous Waste, ,	11	DM	4400	P
2.					
3.					
4.					

13. Special Handling Instructions and Additional Information
1) WIP852053-IDW soil cuttings
ER Phone# Contracted by Bay West W/3E/Verisk (Contract# 5567)
Job#: J200402 LF Solid - NH

OV36195

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Andrew Eddy
Signature:
Month: 3 Day: 31 Year: 21

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Eric Murray
Signature:
Month: 4 Day: 7 Year: 21

Transporter 2 Printed/Typed Name: JGengler
Signature:
Month: 4 Day: 7 Year: 21

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name:
Signature:
Month: Day: Year:

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
NONHAZARDOUS	1	3E: 800-451-8346	J200402-SRR

GENERATOR

5. Generator's Name and Mailing Address
MPCA-SW27 Vadnais Heights
520 Lafayette Road
St. Paul, MN 55155
Generator's Phone 651-757-2308

Generator's Site Address (if different than mailing address)
MPCA-SW#27
641 County Road F East
Vadnais Heights, MN 55127

6. Transporter 1 Company Name
BAY WEST LLC
U.S. EPA ID Number
MND982205437

7. Transporter 2 Company Name
Veolia ES Technical Solutions-NJ
U.S. EPA ID Number
NJD080631369

8. Designated Facility Name and Site Address
Veolia ES Technical Solutions - SRR
4301 Infirmary Road
West Carrollton, OH 45449
Facility's Phone: 937-859-6101
U.S. EPA ID Number
OHD093945293

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1	Non DOT, Non RCRA Hazardous Waste, ,	11	DM	4400	P
2.					
3.					
4.					

13. Special Handling Instructions and Additional Information
1) WIP852053-IDW soil cuttings
ER Phone# Contracted by Bay West W/3E/Verisk (Contract# 5567)
Job#: J200402 LF Solid - NH

OV36195

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name	Signature	Month	Day	Year
Andrew Eddy		3	31	21

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name	Signature	Month	Day	Year
Eric Murray		4	7	21
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year
JGangler		4	7	21

DESIGNATED FACILITY

17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator) Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name	Signature	Month	Day	Year

Appendix B

2021 Sampling and Construction Logs

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099
Customer-Focused Environmental & Industrial Solutions

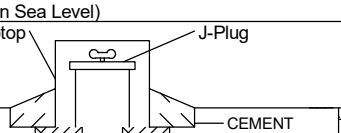
BOREHOLE LOCATION SKETCH MAP

N

See Figure

WELL CONSTRUCTION LOG

BOREHOLE NO. **SW27-MW-05**			
PROJECT NO. / NAME **J200402 / SW#27 Vadnais Heights**	LOCATION **Vandais Heights, MN**		
APPROVED BY **Erik Nimlos**			
DRILLING CONTRACTOR / DRILLER **Thein / Nathan**	LOGGED BY **Stef Mayer**		
DRILLING EQUIPMENT / METHOD **Geo Probe / Hollow Stem Auger**	SIZE / TYPE OF BIT **2 inch**	SAMPLING METHOD **Macrocore**	START-FINISH DATE **10/13/20-10/13/20**
CASING MAT. / DIA. **Plastic / 2 inches**	SCREEN: TYPE **Johnson** MAT. **PVC** TOTAL LENGTH **10 feet** DIA. **2 inches** SLOT SIZE **.010**		
ELEVATION OF: (FT. ABOVE Mean Sea Level)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN **/** GW SURFACE GW DATE **10/13/2020**



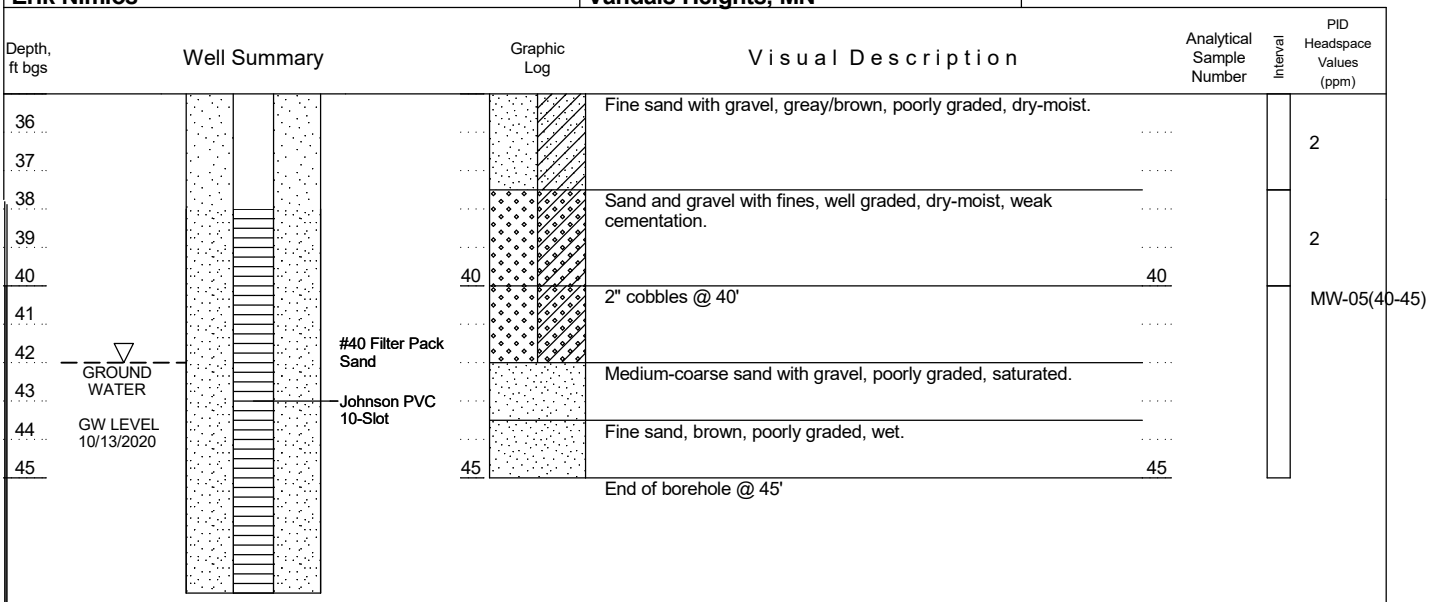
Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Interval	PID Headspace Values (ppm)
1		Sand and fines, black and brown, OM-roots			
2		Fine sand with fines and gravel <1/4", yellowish-green brown, well cemented, moist-dry.			1.9
3		Dry light grey/tan fines (silt) with white thin layers, red flakes			
4					0.4
5		No recovery, cobble stuck in tube			
6					
7					
8					
9					
10		some sand (fine) with small gravel <1/8", red/brown, poorly graded sand with gravel			
11					2.5
12					
13		2" cobble @ 12.5'			
14					0.7
15		fine sand, tan, dry with clay lenses <1x3cm			
16					
17		2" cobble block @ 16'			2.2
18					
19		Sand with corasre grains and fines, sugary. Sand with clay and gravel <1/8"			1
20					
21		Got stuck in macro tube, recovered 12" of sand/clay and gravel mix, well graded (SW-SC)			
22					0.3
23					
24					0.3
25					
26		2" cobble @ 25'			
27					0.9
28					
29		Sandy clay with gravel <1", brownish red, well graded, moist			0.2
30					
31		Clayey sand with gravel, reddish brown, dry-moist, 1" sandstone cobble.			0.9
32					
33					
34					0.5
35					

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099

Customer-Focused Environmental & Industrial Solutions

WELL CONSTRUCTION LOG

BOREHOLE NO.	
SW27-MW-05	
PROJECT NO. / NAME	LOCATION
J200402 / SW#27 Vadnais Heights	**Vandais Heights, MN**
APPROVED BY	
Erik Nimlos	



Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099

Customer-Focused Environmental & Industrial Solutions

WELL CONSTRUCTION LOG

BOREHOLE NO.	
SW27-MW-05	
PROJECT NO. / NAME	LOCATION
J200402 / SW#27 Vadnais Heights	
APPROVED BY	
Erik Nimlos	**Vandais Heights, MN**

Depth, ft bgs	Well Summary	Graphic Log	Visual Description	Analytical Sample Number	Interval	PID Headspace Values (ppm)

WELL CONSTRUCTION LOG SW27_VANDAISHEIGHTS_J200402.GPJ ENV LOG #1.GDT 10/30/20

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099
Customer-Focused Environmental & Industrial Solutions

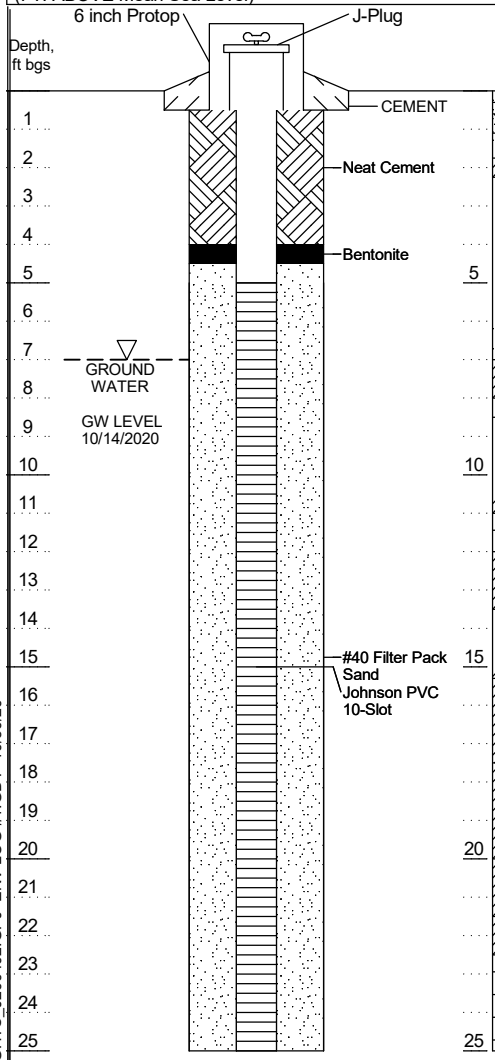
BOREHOLE LOCATION SKETCH MAP

N

See Figure

WELL CONSTRUCTION LOG

BOREHOLE NO. **SW27-MW-06**	
PROJECT NO. / NAME **J200402 / SW#27 Vadnais Heights**	LOCATION **Vandais Heights, MN**
APPROVED BY **Erik Nimlos**	
DRILLING CONTRACTOR / DRILLER **Thein / Nathan**	LOGGED BY **Stef Mayer**
DRILLING EQUIPMENT / METHOD **Geo Probe / Hollow Stem Auger**	SIZE / TYPE OF BIT **2 inch**
SAMPLING METHOD **Macrocore**	START-FINISH DATE **10/14/20-10/14/20**
CASING MAT. / DIA. **Plastic / 2 inches**	SCREEN: TYPE **Johnson** MAT. **PVC** TOTAL LENGTH **20 feet** DIA. **2 inches** SLOT SIZE **.010**
ELEVATION OF: (FT. ABOVE Mean Sea Level)	GROUND SURFACE / TOP OF WELL CASING / TOP & BOTTOM SCREEN / GW SURFACE / GW DATE **10/14/2020**



Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Interval	PID Headspace Values (ppm)
1		Topsoil, black, moist, roots.			
2		Sand with trace gravel, fine, brown, moist.			1.9
3		cement chunks			
4		Sand with fines, fine, poorly graded.			
5		Clay with sand, lean, dry, medium-low plasticity, no dilatency.			2.1
6					
7		Sand, fine, brown, moist			2.2
8		Clay with sand, brown/red, low-medium plasticity, no dilatency			
9		Organic matter.			2.1
10					
11		Sand with clay, very fine, brown.			
12		Organic matter, black, moist, roots			2.2
13		Silty clay with gravel, grey, medium plasticity, no dilatency.			
14					1.8
15		Sand with trace gravel, fine, brown.			
16		Clay with gravel, gray, medium plasticity, no dilatency.			1.3
17					
18		Cobble, black >2" @ 17.5'			
19					1
20					
21		Clay, brown, stiff, low-medium plasticity, no dilatency, dry.			
22		Silty clay with gravel <1/4", grey, stiff, sticky, wet.			
23		Organnic matter, black, moist-wet, roots.			
24					
25		End of borehole @ 25'			

WELL CONSTRUCTION LOG SW27_VANDAISHEIGHTS_J200402.GPJ ENV LOG #1.GDT 10/30/20

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099
Customer-Focused Environmental & Industrial Solutions

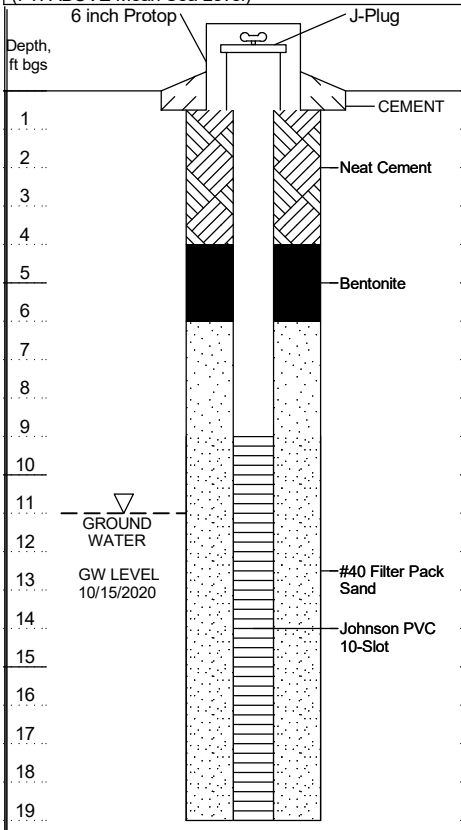
BOREHOLE LOCATION SKETCH MAP

N

See Figure

WELL CONSTRUCTION LOG

BOREHOLE NO. **SW27-MW-07**	
PROJECT NO. / NAME **J200402 / SW#27 Vadnais Heights**	LOCATION **Vandais Heights, MN**
APPROVED BY **Erik Nimlos**	
DRILLING CONTRACTOR / DRILLER **Thein / Nathan**	LOGGED BY **Stef Mayer**
DRILLING EQUIPMENT / METHOD **Geo Probe / Hollow Stem Auger**	SIZE / TYPE OF BIT **2 inch**
SAMPLING METHOD **Macrocore**	START-FINISH DATE **10/15/20-10/15/20**
CASING MAT. / DIA. **Plastic / 2 inches**	SCREEN: TYPE **Johnson** MAT. **PVC** TOTAL LENGTH **10 feet** DIA. **2 inches** SLOT SIZE **.010**
ELEVATION OF: (FT. ABOVE Mean Sea Level)	GROUND SURFACE / TOP OF WELL CASING / TOP & BOTTOM SCREEN / GW SURFACE / GW DATE **10/15/2020**



Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Interval	PID Headspace Values (ppm)
1		Topsoil, black, moist, roots, trace gravel			
2		Sand with trace roots and gravel, dark brown, moist			0.1
3		Sand, light brown, well graded, moist to dry, some gravel <1			
4					0.4
5					
6		Sand, subangular to sub rounded, light brown, poorly graded, dry			
7		Sand & Gravel with cobbles, subangular to subrounded, well graded, moist			0.7
8					
9					0.5
10					
11		Sand, fine, light brown, poorly graded, moist			MW-07(10-15)
12		Sand, medium, sugary, poorly graded, saturated, trace gravel			0.2
13					
14					0.2
15					
16		Sand & gravel, coarse, subrounded, well graded, subrounded to rounded			0
17					
18		Sand with fines, medium, subangular-subrounded, poorly graded, saturated			
19					0
20		End of borehole @ 20'			

WELL CONSTRUCTION LOG SW27_VANDAISHEIGHTS_J200402.GPJ ENV LOG #1.GDT 10/30/20

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099
Customer-Focused Environmental & Industrial Solutions

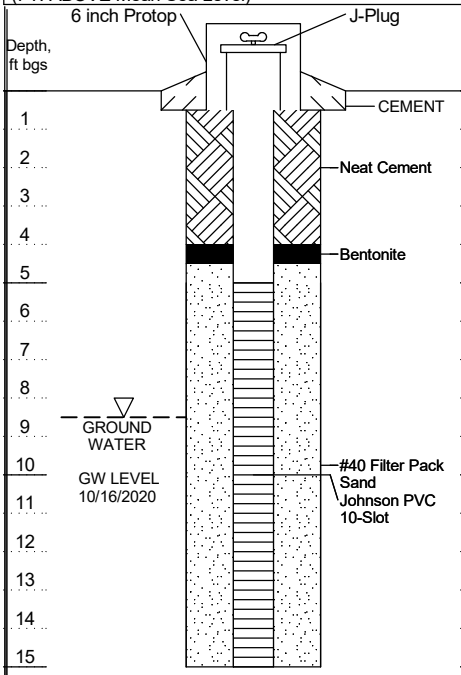
BOREHOLE LOCATION SKETCH MAP

N

See Figure

WELL CONSTRUCTION LOG

BOREHOLE NO. **SW27-MW-08**			
PROJECT NO. / NAME **J200402 / SW#27 Vadnais Heights**	LOCATION **Vandais Heights, MN**		
APPROVED BY **Erik Nimlos**			
DRILLING CONTRACTOR / DRILLER **Thein / Nathan**	LOGGED BY **Stef Mayer**		
DRILLING EQUIPMENT / METHOD **Geo Probe / Hollow Stem Auger**	SIZE / TYPE OF BIT **2 inch**	SAMPLING METHOD **Macrocore**	START-FINISH DATE **10/16/20-10/16/20**
CASING MAT. / DIA. **Plastic / 2 inches**	SCREEN: TYPE **Johnson** MAT. **PVC**	TOTAL LENGTH **10 feet**	DIA. **2 inches** SLOT SIZE **.010**
ELEVATION OF: (FT. ABOVE Mean Sea Level)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN **/** GW SURFACE GW DATE **10/16/2020**



Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Interval	PID Headspace Values (ppm)
1		Organic matter, moist, roots, sand, trace gravel			
2		Sand, red, dry, clayey, with trace cobbles Black piece of plastic at 11 inches			0.2
3		Clayey sand, grey, dry, trace silt			
4					1.1
5					
6		Sand with trave gravel, black, moist, dispersed organic matter			1.3
7					
8					MW-08(7.5-12.5)
9		Silty clay, black, grey, white, dispersed organic matter			2
10		Silty clay, grey			
11		Silty sand, grey, saturated, trace gravel			1.8
12					
13					
14		Silt, grey, compact, medium cementation, moist			1.5
15		End of borehole @ 15'			

WELL CONSTRUCTION LOG SW27_VANDAISHEIGHTS_J200402.GPJ ENV LOG #1.GDT 10/30/20

Bay West
Customer-Focused Environmental & Industrial Solutions

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099

SOIL BORING LOG

BOREHOLE NO. **SW27-SB16**		
PROJECT NO. / NAME **J200402 / SW#27 Vadnais Heights**	LOCATION **Vandais Heights, MN**	
APPROVED BY **Erik Nimlos**		
DRILLING CONTRACTOR **Thein**	DRILLER'S NAME **Nathan**	
DRILLING EQUIPMENT / METHOD **Geo Probe / Hollow Stem Auger**	SIZE / TYPE OF BIT **2 inch**	START - FINISH DATE **10/13/20 - 10/13/20**
LOGGED BY **Stef Mayer**	SAMPLING METHOD **Macrocore**	
ELEVATION OF: GROUND SURFACE (FT. ABOVE Mean Sea Level)	GW SURFACE '	GW ELEVATION DATE

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm) PID
1		Topsoil, black dark soil, moist, grass and leaves.			
		Fine sand, brown, dry, OM.			0
2		Sand with angular gravel, reddish brown, dry.			
3		Sand with fines and gravel throughout, reddish brown, subangular-angular.			
4					0
5					
6		Fine sand with fines and gravel <2", reddish brown, subangular-angular, white substance in clayey material @ 6.5'.			
7					0
8		Sand with fines, reddish, moist			
9		Sandy clay, brown/gray/green, OM-roots			0
10		Clayey sand with trace gravel, subangular/subrounded			
11		Clayey sand, brown.			
		Clay/OM with sand, dark brown, moist, roots.			0
12		Fine sand with coarse sand and gravel, reddish.			
13					
14					0
15		Clay, grayish brown, dry, lean, medium plasticity			
16		Clay, gray/brown, medium-high plasticity.			
17		2" cobble, subrounded-rounded @ 16'.			0
18					
19					0
20		Sand, fine-medium, salt/pepper color.			
21		Sand with fines and trace gravel <1", brown, subangular-subrounded, moist-wet.			
22					0
23					
24					0
25					
26		Sandy clay with gravel <1/2", reddish, gravel subrounded, moist.			
27					0.5
28					
29					0.2
30					
		End of borehole @ 30'			

SOIL BORING LOG SW27_VANDAISHEIGHTS_J200402.GPJ BAY WEST BORING LOG TEMPLATE.GDT 10/30/20

Bay West
Customer-Focused Environmental & Industrial Solutions

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099

SOIL BORING LOG

BOREHOLE NO. **SW27-SB17**		
PROJECT NO. / NAME **J200402 / SW#27 Vadnais Heights**	LOCATION **Vandais Heights, MN**	
APPROVED BY **Erik Nimlos**		
DRILLING CONTRACTOR **Thein**	DRILLER'S NAME **Nathan**	
DRILLING EQUIPMENT / METHOD **Geo Probe / Hollow Stem Auger**	SIZE / TYPE OF BIT **2 inch**	START - FINISH DATE **10/13/20 - 10/13/20**
LOGGED BY **Stef Mayer**	SAMPLING METHOD **Macrocore**	
ELEVATION OF: GROUND SURFACE (FT. ABOVE Mean Sea Level)	GW SURFACE '	GW ELEVATION DATE

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm) PID
1		Clayey sand, dark brown, roots.			
1		Asphalt.			3.5
2		OM-roots, moist.			
3					
4		Sand and gravel pack			1.8
5		Sand, grey, very fine, 2"			
5		Clay/sand/trace gravel, gray, iron staining.	SB-17(0-5)		
6		Sandy organic material, brown/black, trace root and gravel			
7		Sand clay, grey, trace gravel <1/4"			0.2
7		Sand with fines, saturated.			
8		Clay with small gravel <1/4", grey, dry, lean, medium plasticity, iron staining.			
9					0.5
10					
11		Clay, grey medium plasticity, firm, lean, dry, small gravel <1/4".			
12					0.6
13		Clay, brown, low plasticity, lean, dry.			
14					0.5
15		Sand with trace gravel <1/4", brown, moist-wet, fines.			
16		Clayey sand with gravel, red/brown, subangular-subrounded, moist-wet.			
17					0.3
18					
19		Sand with clay, brown/grey, medium cementation, moist.			0.2
20					
21		Sand, fine-medium, grey, weak cementation, wet.			
22					1.3
23		Sand, fine, tight.			
24		Sand, coarse, grey/brown, wet.			1.2
25					
26		Sand, fine, brown, saturated.			
27					0.8
28					
29		Sand, coarse fining up, moist-wet.			0.4
30		Sand, fine-medium, moist-wet.			
		End of borehole @ 30'			

SOIL BORING LOG MPCA_SW27 VANDAIS HEIGHTS_J200402.GPJ BAY WEST BORING LOG TEMPLATE.GDT 6/28/21

Bay West
Customer-Focused Environmental & Industrial Solutions

Bay West
5 Empire Drive
St. Paul, MN 55103
Telephone: 800-279-0456
Fax: 651-291-0099

SOIL BORING LOG

BOREHOLE NO. **SW27-SB18**		
PROJECT NO. / NAME **J200402 / SW#27 Vadnais Heights**	LOCATION **Vandais Heights, MN**	
APPROVED BY **Erik Nimlos**		
DRILLING CONTRACTOR **Thein**	DRILLER'S NAME **Nathan**	
DRILLING EQUIPMENT / METHOD **Geo Probe / Hollow Stem Auger**	SIZE / TYPE OF BIT **2 inch**	START - FINISH DATE **10/13/20 - 10/13/20**
LOGGED BY **Stef Mayer**	SAMPLING METHOD **Macrocore**	
ELEVATION OF: GROUND SURFACE (FT. ABOVE Mean Sea Level)	GW SURFACE '	GW ELEVATION DATE

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm) PID
1		Organic matter and sand, dark brown, plants.			
		Sandy clay, dark tan.			0
2		Gravel, subangular-angular, tan.			
		Sandy organic material, dark brown.			
3		Sand, fine, brown and black, moist, asphalt chunks <2".			
		Sand, fine, saturated, clay lenses.			2.3
4		Organic matter (OM)			
5					
		Tar asphalt, strong odor, weathered.	SB-18(2.5-7.5)		
6		Clay, black, organic matter.			
		Sand and organic matte, fine, brown/black.			0.2
7		Clay, grey , moist.			
8		Sand, fine, brown			
9		Clay cobble 2" @ 8.5'			0
10		Clayey sand with trace gravel, reddish/brown, subangular-subrounded.			
		Sand, fine, brown, wet.			
11					0.3
12					
13		sand with trace gravel, fine, reddish, subangular-subrounded,			
		medium-weak cementation, moist.			0
14					
15					
		Silty sand with trace gravel, reddish, subangular-subrounded.			
16		Clay with trace gravel, gray/green, firm, medium plasticity.			0
17					
18					
19		Clayey sand, brown/red, moist.			0
20					
21		Sand with fines and trace gravel, fine, reddish,			
		subangular-subrounded, wet-moist.			0.3
22					
		Compaction increases @ 22'			
23		Cobble 2" @ 23'			
24					0.1
25					
26		Sandy/clayey with trace gravel, reddish/brown,			
		subangular-subrounded, firm, sugary.			0
27					
28					
29					0
30					
		End of borehole @ 30'			

SOIL BORING LOG SW27_VANDAISHEIGHTS_J200402.GPJ BAY WEST BORING LOG TEMPLATE.GDT 10/30/20

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW-01
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-10-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW-01	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3CPM Rs: 18.5 Rd: 1.5 20psi
WELL DIAMETER (in) :	2	PURGE RATE (~~gpm~~):	250 mL/min
WELL DEPTH, TOTAL (ft) :	19.26	PURGE START TIME :	1030
DEPTH TO WATER (toc):	5.87 DATE: 5-10-21	PURGE END TIME :	1125
WATER COLUMN HEIGHT (ft):	13.39	SAMPLING BEGIN / END TIME :	1130 / 1200
WELL VOLUME (gal) :	2.14	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : (.16 - 2") .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3%**	**±3%**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1030	—	16.80	0.805	2.21	8.57	4	93.2	5.85
2	1035	1.25	12.38	0.874	0.00	7.51	70	49.9	5.85
3	1040	2.50	11.59	0.896	0.00	7.48	76	52.0	5.85
4	1045	3.75	11.04	0.910	0.00	7.44	79	51.0	5.85
5	1050	5.0	11.01	0.917	0.00	7.40	87	45.0	5.85
6	1055	6.25	10.29	0.948	0.00	7.37	90	43.5	5.85
7	1100	7.50	10.75	0.956	0.00	7.37	93	36.6	5.85
8	1105	8.25	10.23	0.993	0.00	7.34	92	10.1	5.85
9	1110	10.0	10.21	1.00	0.00	7.29	93	25.4	5.85
10	1115	11.25	10.19	1.02	0.00	7.31	93	4.7	5.85

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :	3.63	
# OF WELL VOLUMES PURGED:	1.70	
STAB. TEMP (C) :	9.79	DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :	1.05	2,3,7,8 TCD
STAB. D.O. :	0.00	1,4 Dioxane
STAB. pH :	7.27	PFAS
STAB. ORP :	86	Nitrate+Nitrite
STAB. TURBIDITY:	0.0	Gross Alpha

SAMPLE TIME : 1130 SAMPLE FIELD FILTERED ? : Yes ~~No~~

FIELD BLANK? Yes / ~~No~~ ? (name/time/comments):

DUPLICATE SAMPLE? Yes / ~~No~~ ? (name/time/comments):

MS/MSD? Yes / ~~No~~ ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: clear ODOR : none

OBSERVATIONS : set bottom of pump @ 14'

Sample tubing left in well at completion? (Yes or (No) :

WEATHER DATA : TEMP.: 50° F SKY : sun WIND : 5-10 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW-01
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-10-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW-01	PURGE / SAMPLE METHOD :	
CASING MATERIAL :		PUMP CONTROLLER SETTING:	
WELL DIAMETER (in) :		PURGE RATE (gpm) :	
WELL DEPTH, TOTAL (ft) :		PURGE START TIME :	5-10-21
DEPTH TO WATER (toc):	DATE:	PURGE END TIME :	
WATER COLUMN HEIGHT (ft):		SAMPLING BEGIN / END TIME :	/
WELL VOLUME (gal) :		PUMP ID # :	WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal) L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3 %**	**±3%**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1120	12.5	9.83	1.03	0.0	7.30	91	0.2	5.85
2	1125	13.75	9.79	1.05	0.0	7.27	86	0.0	5.85
3									
4									
5							-TS		
6							5-10-21		
7									
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS	
TOTAL VOLUME (gal) :			
# OF WELL VOLUMES PURGED:			
STAB. TEMP (C) :		DRO w/ silica gel	
STAB. Sp. CONDUCTIVITY :		2,3,7,8 TCD	
STAB. D.O. :		1,4 Dioxane	
STAB. pH :		PFAS	-TS 5-10-21
STAB. ORP :		Nitrate+Nitrite	
STAB. TURBIDITY:		Gross Alpha	

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: 1 of 1

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	SW27-MW02
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-10-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	PACE
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW02	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3CPM Rate 5 dur 45 20ps
WELL DIAMETER (in) :	2	PURGE RATE (~~gpm~~) :	250mL/min
WELL DEPTH, TOTAL (ft) :	20.40	PURGE START TIME :	1300
DEPTH TO WATER (toc):	7.49 DATE: 5-10-21	PURGE END TIME :	1345
WATER COLUMN HEIGHT (ft):	12.91	SAMPLING BEGIN / END TIME :	1350 / 1450
WELL VOLUME (gal) :	2.07	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : (.16 - 2") .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3%**	**±3%**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1305	~~0~~	9.58	1.32	1.21	7.44	83	277	7.45
2	1310	1.25	8.93	1.32	0.00	7.16	37	169	7.50
3	1315	2.5	8.91	1.31	0.00	7.14	24	124	7.50
4	1320	3.75	8.66	1.30	0.00	7.12	22	83.5	7.50
5	1325	5.0	8.60	1.29	0.00	7.11	22	58.1	7.50
6	1330	6.25	8.70	1.29	0.00	7.11	22	52.3	7.50
7	1335	7.5	8.87	1.28	0.00	7.10	25	45.1	7.50
8	1340	8.75	8.90	1.28	0.00	7.10	27	42.4	7.50
9	1345	10.0	8.86	1.27	0.00	7.08	28	41.9	7.50
~~10~~									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :	2.64	
# OF WELL VOLUMES PURGED:	1.28	
STAB. TEMP (C) :	8.86	DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :	1.27	2,3,7,8 TCD
STAB. D.O. :	0.00	1,4 Dioxane
STAB. pH :	7.08	PFAS
STAB. ORP :	28	Nitrate+Nitrite
STAB. TURBIDITY:	41.9	Gross Alpha

SAMPLE TIME : 1350 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? (Yes) / No ? (name/time/comments): SW27-MW02-D @ 1420

MS/MSD? Yes / (No)? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clear ODOR : none

OBSERVATIONS : set bottom of pump @ 15'

Sample tubing left in well at completion? (Yes or (No):

WEATHER DATA : TEMP.: 50° F SKY : Sun WIND : 0-5 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW03
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-11-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	PACE
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW03	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3 CPM Rate 8.5 dial 5 15 psi
WELL DIAMETER (in) :	2	PURGE RATE ~~(gpm)~~ :	200 mL/min
WELL DEPTH, TOTAL (ft) :	17.29	PURGE START TIME :	0850
DEPTH TO WATER (toc):	3.52 DATE: 5-10-21	PURGE END TIME :	
WATER COLUMN HEIGHT (ft):	13.77	SAMPLING BEGIN / END TIME :	1000 / 1030
WELL VOLUME (gal) :	2.20	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3%**	**±3%**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	0855	-	19.80	2.89	1.10	7.06	91	1000+	4.02
2	0900	1.0	16.13	3.05	0.0	6.62	26	650	3.93
3	0905	2.0	14.82	3.13	0.0	6.61	10	363	3.96
4	0910	3.0	14.28	3.17	0.0	6.59	7	303	3.95
5	0915	4.0	14.14	3.18	0.0	6.59	1	251	3.95
6	0920	5.0	13.93	3.23	0.0	6.58	-5	148	3.95
7	0925	6.0	13.70	3.27	0.0	6.56	-13	92.2	3.95
8	0930	7.0	13.29	3.31	0.0	6.55	-16	67.4	3.95
9	0935	8.0	13.43	3.31	0.0	6.54	-20	83.9	3.95
10	0940	9.0	13.21	3.33	0.0	6.54	-22	53.8	3.95

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :	3.17	
# OF WELL VOLUMES PURGED:	1.44	
~~STAB. TEMP (C) :~~	did not stabilize - turb 83.9-53.8	DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :		2,3,7,8 TCD
STAB. D.O. :		1,4 Dioxane
STAB. pH :		PFAS
STAB. ORP :		Nitrate+Nitrite
STAB. TURBIDITY:		Gross Alpha

SAMPLE TIME : 1000 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes (No) (name/time/comments):

DUPLICATE SAMPLE? Yes / (No)? (name/time/comments):

MS/MSD? Yes (No)? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clear ODOR : none

OBSERVATIONS : set bottom of pump @ 12'

Sample tubing left in well at completion? (Yes or (No))

WEATHER DATA : TEMP.: 50°F SKY : Clear WIND : 25 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW03
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-11-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW03	PURGE / SAMPLE METHOD :	
CASING MATERIAL :		PUMP CONTROLLER SETTING:	TT 5-11-21
WELL DIAMETER (in) :		PURGE RATE (gpm) :	
WELL DEPTH, TOTAL (ft) :		PURGE START TIME :	
DEPTH TO WATER (toc):	DATE:	PURGE END TIME :	
WATER COLUMN HEIGHT (ft):		SAMPLING BEGIN / END TIME :	/
WELL VOLUME (gal) :		PUMP ID # :	WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME L ~~(gal)~~	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3**	**±3**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	0945	10.0	13.03	3.33	0.0	6.53	-25	44.5	3.95
2	0950	11.0	13.29	3.31	0.0	6.53	-27	43.2	3.95
3	0955	12.0	13.52	3.32	0.0	6.52	-28	32.5	3.95
4									
5									
6									
7						TT 5-11-21			
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :		2,3,7,8 TCD
STAB. D.O. :		1,4 Dioxane
STAB. pH :		PFAS
STAB. ORP :		Nitrate+Nitrite
STAB. TURBIDITY:		Gross Alpha

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments): TT 5-11-21

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW04
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-11-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	PACE
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW04	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	350M Re 18.5 Ai 6.5 20PSI
WELL DIAMETER (in) :	2	PURGE RATE (~~ppm~~) :	250 mL/min
WELL DEPTH, TOTAL (ft) :	15.20	PURGE START TIME :	1120
DEPTH TO WATER (toc):	6.64 DATE: 5-10-21	PURGE END TIME :	1225
WATER COLUMN HEIGHT (ft):	8.56	SAMPLING BEGIN / END TIME :	1230 / 1300
WELL VOLUME (gal) :	1.37	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3%**	**±3%**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1125	—	13.36	2.81	1.81	7.15	108	1000+	7.30
2	1130	1.25	10.70	2.82	0.25	6.77	99	581	7.45
3	1135	2.5	10.05	3.08	0.0	6.73	90	1000+	7.50
4	1140	3.75	10.39	3.43	0.0	6.69	81	615	7.50
5	1145	5.0	10.06	3.45	0.0	6.69	73	566	7.57
6	1150	6.25	10.02	3.48	0.0	6.67	69	498	7.55
7	1155	7.5	10.01	3.57	0.0	6.67	61	414	7.55
8	1200	8.75	9.80	3.61	0.0	6.67	53	379	7.55
9	1205	10.0	9.60	3.39	0.0	6.66	49	469	7.70
10	1210	11.25	9.75	3.59	0.0	6.64	46	397	7.55

STABILIZATION DATA		SAMPLE CONTAINERS
~~TOTAL VOLUME (gal) :~~	3.75	
~~# OF WELL VOLUMES PURGED:~~	2.89	
~~STAB. TEMP (C) :~~	did not stabilize	DRO w/ silica gel
~~STAB. Sp. CONDUCTIVITY :~~		2,3,7,8 TCD
~~STAB. D.O. :~~		1,4 Dioxane
~~STAB. pH :~~	- TT 5-11-21	PFAS
~~STAB. ORP :~~		Nitrate+Nitrite
~~STAB. TURBIDITY:~~		Gross Alpha

SAMPLE TIME : 1230 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: tan/cloudy ODOR : none

OBSERVATIONS : set bottom of pump @ 11'

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 55° F SKY : clear WIND : 0-5 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW04
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-11-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW04	PURGE / SAMPLE METHOD :	
CASING MATERIAL :		PUMP CONTROLLER SETTING:	TT 5-11-21
WELL DIAMETER (in) :		PURGE RATE (gpm) :	
WELL DEPTH, TOTAL (ft) :		PURGE START TIME :	
DEPTH TO WATER (toc):	DATE:	PURGE END TIME :	
WATER COLUMN HEIGHT (ft):		SAMPLING BEGIN / END TIME :	/
WELL VOLUME (gal) :		PUMP ID # :	WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal) L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3 %.**	**±3 %**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1215	12.5	10.00	3.69	0.0	6.63	37	338	7.60
2	1220	13.75	10.01	3.70	0.0	6.64	30	315	7.60
3	1225	15.0	10.01	3.70	0.0	6.65	27	297	7.60
4									
5									
6								TT	
7								5-11-21	
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :		2,3,7,8 TCD
STAB. D.O. :		1,4 Dioxane
STAB. pH :		PFAS
STAB. ORP :		Nitrate+Nitrite
STAB. TURBIDITY:		Gross Alpha

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments): TT 5-11-21

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: 1 of 2

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW05
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-11-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA

WELL NAME :	MW05
CASING MATERIAL :	PVC
WELL DIAMETER (in) :	2
WELL DEPTH, TOTAL (ft) :	50.40
DEPTH TO WATER (toc):	44.89 DATE: 5-10-21
WATER COLUMN HEIGHT (ft):	5.51
WELL VOLUME (gal) :	0.88

PURGE DATA

PURGE / SAMPLE METHOD :	Bladder Pump
PUMP CONTROLLER SETTING:	3GPM Re 1705 di 2.5 30psi
PURGE RATE (~~gpm~~) :	250 mL/min
PURGE START TIME :	1400
PURGE END TIME :	1505
SAMPLING BEGIN / END TIME :	1510 / 1540
PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (~~gal~~) L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3 %**	**±3 %**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1405	—	13.82	0.580	2.11	7.82	103	306	44.85
2	1410	1.25	12.32	0.578	0.63	7.45	113	299	44.85
3	1415	2.5	12.21	0.579	0.67	7.41	114	238	44.85
4	1420	3.75	11.89	0.586	0.82	7.36	117	184	44.85
5	1425	5.0	11.91	0.586	0.83	7.35	117	194	44.85
6	1430	6.25	11.83	0.589	0.83	7.34	118	163	44.85
7	1435	7.5	11.79	0.594	0.86	7.32	120	154	44.85
8	1440	8.75	11.85	0.594	0.75	7.29	121	186	44.85
9	1445	10.0	11.77	0.594	0.82	7.29	121	150	44.85
10	1450	11.25	11.75	0.596	0.86	7.29	121	139	44.85

STABILIZATION DATA

TOTAL VOLUME (gal) :	3.96
# OF WELL VOLUMES PURGED:	4.5
~~STAB. TEMP (C) :~~	did not stabilize
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	turb
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

	DRO w/ silica gel
	2,3,7,8 TCD
	1,4 Dioxane
	PFAS
	Nitrate+Nitrite
	Gross Alpha

SAMPLE TIME : 1510 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: tan/cloudy ODOR : none

OBSERVATIONS : ~~set~~ bottom of pump @ 48'

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 55° F SKY : Sun WIND : 5-10 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW05
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-11-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW05	PURGE / SAMPLE METHOD :	
CASING MATERIAL :		PUMP CONTROLLER SETTING:	
WELL DIAMETER (in) :		PURGE RATE (gpm) :	
WELL DEPTH, TOTAL (ft) :		PURGE START TIME :	
DEPTH TO WATER (toc):	DATE:	PURGE END TIME :	
WATER COLUMN HEIGHT (ft):		SAMPLING BEGIN / END TIME :	/
WELL VOLUME (gal) :		PUMP ID # :	WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal) L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3%**	**±3%**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1455	12.5	11.50	2.599	0.81	7.25	123	154	44.85
2	1500	13.75	11.36	2.599	0.81	7.25	124	128	44.85
3	1505	15.0	11.60	0.600	0.79	7.24	123	121	44.85
4									
5									
6									
7									
8						- IT			
9						5-11-21			
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :		2,3,7,8 TCD
STAB. D.O. :		1,4 Dioxane
STAB. pH :		PFAS
STAB. ORP :		Nitrate+Nitrite
STAB. TURBIDITY:		Gross Alpha

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: 1 of 1

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW06
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-12-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW06	PURGE / SAMPLE METHOD :	Bladder pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3PM Rate 18 d12 20psi
WELL DIAMETER (in) :	2	PURGE RATE ~~(gpm)~~ :	250 mL/min
WELL DEPTH, TOTAL (ft) :	27.30	PURGE START TIME :	0830
DEPTH TO WATER (toc):	5.99 DATE: 5-10-21	PURGE END TIME :	0915
WATER COLUMN HEIGHT (ft):	21.31	SAMPLING BEGIN / END TIME :	0920 / 0950
WELL VOLUME (gal) :	3.41	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : (1 - 2") .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3%**	**±3%**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	0835	—	12.87	1.56	2.63	6.22	84	25.7	6.45
2	0840	1.25	10.46	1.69	0.0	6.33	20	40.3	7.25
3	0845	2.5	9.77	1.71	0.0	6.34	10	29.9	7.30
4	0850	3.75	9.63	1.72	0.06	6.34	7	30.7	7.65
5	0855	5.0	9.43	1.73	0.15	6.32	8	30.9	7.95
6	0900	6.25	9.49	1.72	0.22	6.32	8	38.0	8.20
7	0905	7.5	9.18	1.73	0.35	6.32	10	38.5	8.55
8	0910	8.75	9.30	1.73	0.39	6.32	11	38.6	8.80
9	915	10.0	9.22	1.74	0.41	6.31	13	36.1	9.05
10									

STABILIZATION DATA	
TOTAL VOLUME (gal) :	2.64
# OF WELL VOLUMES PURGED:	0.77
STAB. TEMP (C) :	9.22
STAB. Sp. CONDUCTIVITY :	1.74
STAB. D.O. :	0.41
STAB. pH :	6.31
STAB. ORP :	13
STAB. TURBIDITY:	36.1

SAMPLE CONTAINERS

DRO w/ silica gel	
2,3,7,8 TCD	
1,4 Dioxane	
PFAS	
Nitrate+Nitrite	
Gross Alpha	

SAMPLE TIME : 0920 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / ~~No~~? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No)? (name/time/comments):

MS/MSD? Yes / (No)? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clear ODOR : none

OBSERVATIONS : set bottom of pump @ 22'

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: 50°F SKY : Clear WIND : 0-5 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: of

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW07
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-12-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	PACE
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW07	PURGE / SAMPLE METHOD :	Bladder pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3 cpm Re 18.5 di 1.5 20 psi
WELL DIAMETER (in) :	2	PURGE RATE ~~(gpm)~~ :	~~203~~ 250mL/min
WELL DEPTH, TOTAL (ft) :	20.84	PURGE START TIME :	1100
DEPTH TO WATER (toc):	13.61 DATE: 5-12-21	PURGE END TIME :	1150
WATER COLUMN HEIGHT (ft):	7.2	SAMPLING BEGIN / END TIME :	1145 /
WELL VOLUME (gal) :	1.15	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : (1 - 2") .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3 %.**	**±3 %.**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1105	—	15.17	0.485	6.95	7.60	93	66.4	13.60
2	1110	1.26	10.68	0.594	2.48	7.38	95	36.2	13.60
3	1115	2.5	10.31	0.611	2.00	7.35	91	22.9	13.60
4	1120	3.75	10.10	0.618	1.90	7.35	88	23.6	13.60
5	1125	5.0	10.00	0.622	1.82	7.33	87	17.7	13.60
6	1130	6.25	9.85	0.625	1.79	7.33	86	16.5	13.60
7	1135	7.5	9.91	0.626	1.77	7.33	86	12.7	13.60
8	1140	8.25	9.88	0.628	1.75	7.31	89	11.9	13.60
9	1145	10.0	9.83	0.632	1.71	7.29	90	11.6	13.60
10	1150	11.25	9.79	0.633	1.72	7.29	92	12.2	13.60

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :	2.97	
# OF WELL VOLUMES PURGED:	2.58	
STAB. TEMP (C) :	9.79	DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :	0.633	2,3,7,8 TCD
STAB. D.O. :	1.72	1,4 Dioxane
STAB. pH :	7.29	PFAS
STAB. ORP :	92	Nitrate+Nitrite
STAB. TURBIDITY:	12.2	Gross Alpha

SAMPLE TIME : 1155 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? (Yes) / No ? (name/time/comments): SW27-FB01 @ 1300

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments): ~~SW2~~

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clear ODOR : none

OBSERVATIONS : set bottom of pump @ 17'

Sample tubing left in well at completion? (Yes or (No))

WEATHER DATA : TEMP.: 60°F SKY : Clear WIND : 2-5 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: 1 of 2

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW08
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-12-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	RACE
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW08	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3GPM Rg 18.5 di 1.5 15psi
WELL DIAMETER (in) :	2	PURGE RATE (~~gpm~~):	200 mL/min
WELL DEPTH, TOTAL (ft) :	17.00	PURGE START TIME :	1355
DEPTH TO WATER (toc):	6.08 DATE: 5-10-21	PURGE END TIME :	1500
WATER COLUMN HEIGHT (ft):	10.92	SAMPLING BEGIN / END TIME :	1505 /
WELL VOLUME (gal) :	1.74	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : (.16 - 2") .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3 %**	**±3 %**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1400	—	15.33	1.65	2.02	7.11	142	1000+	6.95
2	1405	1.0	10.66	1.77	2.0	6.87	110	401	7.10
3	1410	2.0	10.19	1.72	2.0	6.84	59	168	7.05
4	1415	3.0	10.01	1.69	2.0	6.82	30	75.9	7.10
5	1420	4.0	9.88	1.67	2.0	6.80	6	50.0	7.10
6	1425	5.0	9.80	1.66	2.0	6.78	-7	32.9	7.10
7	1430	6.0	9.57	1.64	2.0	6.77	-15	24.5	7.10
8	1435	7.0	9.50	1.63	2.0	6.75	-19	19.4	7.10
9	1440	8.0	9.54	1.62	2.0	6.72	-22	19.3	7.10
10	1445	9.0	9.47	1.61	2.0	6.71	-23	24.0	7.10

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :	~~3.37~~ 3.17 - #	
# OF WELL VOLUMES PURGED:	~~1.94~~ 1.82	
~~STAB. TEMP (C)~~ :	did not stabilize so ~~dup~~ dup -#	DRO w/ silica gel
STAB. Sp. CONDUCTIVITY :		2,3,7,8 TCD
STAB. D.O. :		1,4 Dioxane
STAB. pH :		PFAS
STAB. ORP :		Nitrate+Nitrite
STAB. TURBIDITY:		Gross Alpha

SAMPLE TIME : 1505 SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clear ODOR : none

OBSERVATIONS : set bottom of pump @ 12'

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 60° F SKY : sun WIND : 0-5 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	SW#27 Vadnais Landfill	PROJECT # :	J200402
ADDRESS :	655 County Road F East	SAMPLE ID:	MW08
CITY, STATE, ZIP :	Vadnais Heights, MN	DATE:	5-12-21
SAMPLER :	Ted Toegel	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW08	PURGE / SAMPLE METHOD :	
CASING MATERIAL :		PUMP CONTROLLER SETTING:	
WELL DIAMETER (in) :		PURGE RATE (gpm) :	
WELL DEPTH, TOTAL (ft) :		PURGE START TIME :	
DEPTH TO WATER (toc):	DATE:	PURGE END TIME :	
WATER COLUMN HEIGHT (ft):		SAMPLING BEGIN / END TIME :	/
WELL VOLUME (gal) :		PUMP ID # :	WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ L	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**±3 %**	**±3 %**	**±10%/<0.5**	**±0.1**	**±10**	**±10%/<5**	
1	1450	10.0	9.29	1.59	0.0	6.70	-26	17.6	7.10
2	1455	11.0	9.40	1.59	0.0	6.67	-27	13.3	7.10
3	1500	12.0	9.36	1.58	0.0	6.65	-28	9.8	7.10
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS	
TOTAL VOLUME (gal) :			
# OF WELL VOLUMES PURGED:			
STAB. TEMP (C) :		DRO w/ silica gel	
STAB. Sp. CONDUCTIVITY :		2,3,7,8 TCD	-15
STAB. D.O. :		1,4 Dioxane	
STAB. pH :		PFAS	5-12-21
STAB. ORP :		Nitrate+Nitrite	
STAB. TURBIDITY:		Gross Alpha	

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME: J200402 VADNAIS LANDFILL	PROJECT #: J200402
ADDRESS:	SAMPLE ID: SW27-MW01
CITY, STATE, ZIP:	DATE: 10/28/20
SAMPLER: ZACH MASON	ANALYTICAL LABORATORY: PACE
COMPANY: BAY WEST	CHAIN OF CUSTODY #:

WELL DATA	PURGE DATA
WELL NAME: MW-1	PURGE / SAMPLE METHOD: BLADDER PUMP
CASING MATERIAL: PVC	PUMP CONTROLLER SETTING: 0-20
WELL DIAMETER (in): 2	PURGE RATE (gpm): 0.20 LPM @ INCREASE TO 0.44
WELL DEPTH, TOTAL (ft): 19.29	PURGE START TIME: 1553
DEPTH TO WATER (toc): 5.91 DATE: 10/28/20	PURGE END TIME: 1653
WATER COLUMN HEIGHT (ft): 13.38	SAMPLING BEGIN / END TIME: 1655 /
WELL VOLUME (gal):	PUMP ID #: WATER LEVEL ID #:

VOLUME CONVERSION FACTOR: .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	1553	200	11.62	1.24	3.41	7.01	158	135	5.91
2	1558	1300	12.30	1.23	1.14	6.95	121	155	5.90
3	1603	2700	12.34	1.25	0.97	6.90	105	109	5.92
4	1608	3400	12.34	1.27	1.09	6.85	97	62.1	5.93
5	1613	5440	12.34	1.28	1.23	6.84	84	47.3	5.90
6	1618	7440	12.34	1.28	1.39	6.85	78	40.8	5.90
7	1623	9440	12.32	1.29	1.53	6.85	77	31.7	5.90
8	1628	11440	12.32	1.28	1.65	6.84	79	27.5	5.90
9	1633	13440	12.31	1.28	1.71	6.86	82	23.9	5.90
10	1638	15440	12.31	1.28	1.75	6.86	85	18.4	5.89

STABILIZATION DATA	
TOTAL VOLUME (gal):	
# OF WELL VOLUMES PURGED:	COULD NOT STABILIZE
STAB. TEMP (C):	
STAB. Sp. CONDUCTIVITY:	
STAB. D.O.:	
STAB. pH:	
STAB. ORP:	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

VOC:	____ - 40 ml vials w/HCL preserved (3 vials per sample)
GRO:	____ - 40 ml vials w/HCL preserved (3 vials per sample)
DRO:	____ - 1 L amber glass w/HCL preserved (1 liter jar per sample)
SVOC:	____ - 1 L amber glass, unpreserved (1 liter jar per sample)
Diss. Pb / As / Zn:	____ - 250 ml plastic w/HNO_3 preserved (field filtered)
Total Pb / As / Zn:	____ - 250 ml plastic w/HNO_3 preserved (non-field filtered)
Dioxins:	____ - 1 L amber glass, unpreserved (2 liter jars per sample)

SAMPLE TIME: 1653 SAMPLE FIELD FILTERED ?: Yes / (No)

FIELD BLANK? Yes / (No) (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) (name/time/comments):

MS/MSD? Yes / (No) (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR:

OBSERVATIONS: set bottom of pump @ 17 ft BTOC

* INCREASED FLOW TO 3 GPM @ 0.44 LPM @ 1603

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA: TEMP.: 36° SKY: Cloudy WIND: SSW 6 MPH

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-01	PURGE / SAMPLE METHOD :
CASING MATERIAL :	PUMP CONTROLLER SETTING:
WELL DIAMETER (in) :	PURGE RATE (gpm) :
WELL DEPTH, TOTAL (ft) :	PURGE START TIME :
DEPTH TO WATER (toc): DATE:	PURGE END TIME :
WATER COLUMN HEIGHT (ft):	SAMPLING BEGIN / END TIME : /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	1643	17440	12.32	1.29	1.78	6.84	89	15.8	5.89
2	1648	19440	12.28	1.29	1.84	6.86	90	14.6	5.89
3	1653	21440	12.28	1.30	2.25	6.85	87	13.9	5.89
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA	
TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

- VOC: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
- GRO: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
- DRO: ____ - 1 L amber glass w/HCL preserved (1 liter jar per sample)
- SVOC: ____ - 1 L amber glass, unpreserved (1 liter jar per sample)
- Diss. Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (field filtered)
- Total Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (non-field filtered)
- Dioxins: ____ - 1 L amber glass, unpreserved (2 liter jars per sample)

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: | of 2

PROJECT NAME: VADNAIS LANDFILL	PROJECT #: J2002102
ADDRESS:	SAMPLE ID: SW27-MW02
CITY, STATE, ZIP:	DATE: 10/29/20
SAMPLER: ZACH MASON	ANALYTICAL LABORATORY: DACE
COMPANY: BAY WEST	CHAIN OF CUSTODY #:

WELL DATA

WELL NAME: MW-02	
CASING MATERIAL: PVC	
WELL DIAMETER (in): 2"	
WELL DEPTH, TOTAL (ft): 20.43	
DEPTH TO WATER (toc): 7.43 DATE: 10/29/20	
WATER COLUMN HEIGHT (ft): 13.00	
WELL VOLUME (gal):	

PURGE DATA

PURGE / SAMPLE METHOD:	BLADDER PUMP
PUMP CONTROLLER SETTING:	20PM 20 REFILL 10 DISCH.
PURGE RATE (gpm):	0.342/min
PURGE START TIME:	1110
PURGE END TIME:	1210
SAMPLING BEGIN / END TIME:	1215 /
PUMP ID #:	WATER LEVEL ID #:

VOLUME CONVERSION FACTOR: .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			±	±	±	±	±	±	
1	1110	220	9.59	1.27	1.42	6.37	78	593	7.43
2	1115	1200	10.67	1.30	0.47	6.32	39	518	7.44
3	1120	2400	10.95	1.31	0.30	6.35	20	494	7.48
4	1125	3940	10.82	1.31	0.26	6.30	26	382	7.44
5	1130	5500	10.90	1.31	0.26	6.32	26	322	7.44
6	1135	6700	10.90	1.30	0.23	6.35	21	284	7.44
7	1140	8360	10.90	1.30	0.22	6.30	24	239	7.44
8	1145	9940	11.05	1.29	0.26	6.36	20	203	7.44
9	1150	11680	11.08	1.29	0.24	6.36	24	155	7.44
10	1158	1338	11.04	1.28	0.26	6.37	20	130	7.45

STABILIZATION DATA

TOTAL VOLUME (gal):	
# OF WELL VOLUMES PURGED:	COULD NOT STABILIZE
STAB. TEMP (C):	
STAB. Sp. CONDUCTIVITY:	
STAB. D.O.:	
STAB. pH:	
STAB. ORP:	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME: 1215 SAMPLE FIELD FILTERED?: Yes / No

FIELD BLANK? Yes / No (name/time/comments): EQUIPMENT BLANK SW27-EB01 @ 1245

DUPLICATE SAMPLE? Yes / No ? (name/time/comments): SW27-MW02-D @ 1245

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: CLOUDY LIGHT TAN ODOR: NONE

OBSERVATIONS: SET BOTTOM OF PUMP @ 15 ft BTOC

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA: TEMP.: 30° SKY: OVERCAST WIND: N 8 MPH

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-62	PURGE / SAMPLE METHOD :
CASING MATERIAL :	PUMP CONTROLLER SETTING:
WELL DIAMETER (in) :	PURGE RATE (gpm) :
WELL DEPTH, TOTAL (ft) :	PURGE START TIME :
DEPTH TO WATER (toc): DATE:	PURGE END TIME :
WATER COLUMN HEIGHT (ft):	SAMPLING BEGIN / END TIME : /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			±	±	±	±	±	±	
1	1200	14800	11.02	1.20	0.26	6.37	20	115	7.45
2	1205	16600	11.04	1.28	0.21	6.37	19	99.6	7.44
3	1210	18400	10.97	1.27	0.16	6.32	24	8.5	7.44
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA	
TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME : VADNAIS LANDFILL	PROJECT # : J200402
ADDRESS :	SAMPLE ID: SW27 MW03
CITY, STATE, ZIP :	DATE: 10/29/2020
SAMPLER : ZACH MASON	ANALYTICAL LABORATORY : PACE
COMPANY : BAY WEST	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-03	PURGE / SAMPLE METHOD : BLADDER PUMP
CASING MATERIAL : PVC	PUMP CONTROLLER SETTING: 2GPM 2m' REFILL 10 DISCH.
WELL DIAMETER (in) : 2"	PURGE RATE (gpm) : 0.22 GPM
WELL DEPTH, TOTAL (ft) : 17.29	PURGE START TIME : 1442
DEPTH TO WATER (toc): 3.51 DATE: 10/29/20	PURGE END TIME : 1542
WATER COLUMN HEIGHT (ft): 13.78	SAMPLING BEGIN / END TIME : 1545 /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			±	±	±	±	±	±	
1	1442	2220	9.10	3.78	2.21	6.49	166	833	3.80
2	1447	1320	12.00	3.80	0.59	6.37	94	663	4.02
3	1452	2640	12.28	3.79	0.58	6.32	49	477	4.01
4	1457	4020	12.18	3.79	0.37	6.25	19	371	4.01
5	1502	5300	12.39	3.77	0.38	6.25	5	307	4.01
6	1507	7200	12.25	3.78	0.26	6.25	-3	215	4.01
7	1512	8920	12.27	3.78	0.22	6.23	-4	167	4.01
8	1517	10620	12.46	3.77	0.21	6.23	-9	115	4.01
9	1522	12020	12.54	3.76	0.16	6.22	-13	88.1	4.01
10	1527	13620	12.46	3.77	0.14	6.17	-13	69.8	4.01

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :	COULD	
STAB. Sp. CONDUCTIVITY :	NOT STABILIZE	
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 1545 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) (name/time/comments):

MS/MSD? Yes / (No) (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: CLOUDY LIGHT TAN ODOR : NONE

OBSERVATIONS : SET BOTTOM OF PUMP @ 12ft BTOC

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 35° SKY : PARTLY CLOUDY WIND : N 8MPH

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-07	PURGE / SAMPLE METHOD :
CASING MATERIAL :	PUMP CONTROLLER SETTING:
WELL DIAMETER (in) :	PURGE RATE (gpm) :
WELL DEPTH, TOTAL (ft) :	PURGE START TIME :
DEPTH TO WATER (toc): DATE:	PURGE END TIME :
WATER COLUMN HEIGHT (ft):	SAMPLING BEGIN / END TIME : /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			±	±	±	±	±	±	
1	1532	15220	12.59	3.77	0.14	6.23	-16	59.9	4.01
2	1537	16920	12.58	3.77	0.14	6.21	-19	51.0	4.01
3	1542	18620	12.62	3.76	0.14	6.21	-22	47.4	4.01
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: 1 of 2

PROJECT NAME: VADNAIS LANDFILL	PROJECT #: J2004102
ADDRESS:	SAMPLE ID: SW27-MW04
CITY, STATE, ZIP:	DATE: 10/30/20
SAMPLER: ZACH MASON	ANALYTICAL LABORATORY: PACE
COMPANY: BAY WEST	CHAIN OF CUSTODY #:

WELL DATA

WELL NAME: MW-04	
CASING MATERIAL: PVC	
WELL DIAMETER (in): 2 IN	
WELL DEPTH, TOTAL (ft): 15.73	
DEPTH TO WATER (toc): 6.77 DATE: 10/30/20	
WATER COLUMN HEIGHT (ft): 8.96	
WELL VOLUME (gal):	

PURGE DATA

PURGE / SAMPLE METHOD: BLADDER PUMP	
PUMP CONTROLLER SETTING: 2 psi 20/10	
PURGE RATE (gpm): 0.30 L/min ref DIS	
PURGE START TIME: 1027	
PURGE END TIME: 1130	
SAMPLING BEGIN / END TIME: 1135 /	
PUMP ID #:	WATER LEVEL ID #:

VOLUME CONVERSION FACTOR: .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (L)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	1030	0	12.49	1.48	1.99	6.65	74	1000+	7.05
2	1035	1.5	13.76	1.66	0.45	6.21	57	1000+	7.48
3	1040	3.0	13.96	1.88	0.45	6.27	56	1000+	7.94
4	1045	4.5	14.12	2.02	0.32	6.33	44	1000+	8.16
5	1050	6.0	14.31	2.18	0.36	6.31	38	1000+	8.33
6	1055	7.5	14.36	2.24	0.30	6.32	35	1000+	8.41
7	1100	9.0	14.41	2.29	0.23	6.35	31	1000+	8.56
8	1105	10.5	14.43	2.34	0.04	6.31	25	1000+	8.69
9	1110	12.0	14.49	2.37	0.0	6.28	22	1000+	8.71
10	1115	13.5	14.54	2.44	0.0	6.31	18	1000+	8.80

STABILIZATION DATA

TOTAL VOLUME (gal):	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C):	COULD
STAB. Sp. CONDUCTIVITY:	NOT STABILIZE
STAB. D.O.:	
STAB. pH:	
STAB. ORP:	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

VOC: ____	- 40 ml vials w/HCL preserved (3 vials per sample)
GRO: ____	- 40 ml vials w/HCL preserved (3 vials per sample)
DRO: ____	- 1 L amber glass w/HCL preserved (1 liter jar per sample)
SVOC: ____	- 1 L amber glass, unpreserved (1 liter jar per sample)
Diss. Pb / As / Zn: ____	- 250 ml plastic w/HNO_3 preserved (field filtered)
Total Pb / As / Zn: ____	- 250 ml plastic w/HNO_3 preserved (non-field filtered)
Dioxins: ____	- 1 L amber glass, unpreserved (2 liter jars per sample)

SAMPLE TIME: 1135 SAMPLE FIELD FILTERED?: Yes / (No)

FIELD BLANK? Yes / (No)? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No)? (name/time/comments):

MS/MSD? Yes / (No)? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: DARK BROWN ODOR: NONE

OBSERVATIONS: SET BOTTOM OF PUMP @ 10.5 FT BTOC

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA: TEMP.: 32° SKY: PARTLY CLOUDY WIND: 1 MPH SE

III III III

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA		PURGE DATA	
WELL NAME :	MW-04	PURGE / SAMPLE METHOD :	
CASING MATERIAL :		PUMP CONTROLLER SETTING:	
WELL DIAMETER (in) :		PURGE RATE (gpm) :	
WELL DEPTH, TOTAL (ft) :		PURGE START TIME :	
DEPTH TO WATER (toc):	DATE:	PURGE END TIME :	
WATER COLUMN HEIGHT (ft):		SAMPLING BEGIN / END TIME :	/
WELL VOLUME (gal) :		PUMP ID # :	WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			±	±	±	±	±	±	
1	1120	15.0	14.53	2.51	0.0	6.25	22	1000+	8.81
2	1125	16.5	14.55	2.64	0.0	6.31	17	1000+	8.82
3	1130	18.0	14.59	2.68	0.0	6.30	16	1000+	8.83
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: 1 of 2

PROJECT NAME: VAONAIS LANDFILL	PROJECT #: J200402
ADDRESS:	SAMPLE ID: SW27-MW05
CITY, STATE, ZIP:	DATE: 10/29/20
SAMPLER: ZACH MASON	ANALYTICAL LABORATORY: PACE
COMPANY: BAY WEST	CHAIN OF CUSTODY #:

WELL DATA		PURGE DATA	
WELL NAME:	MW-05	PURGE / SAMPLE METHOD:	BLADDER PUMP
CASING MATERIAL:	PVC	PUMP CONTROLLER SETTING:	2 LPM 20 SEC REFILL, 10 SEC PURGE
WELL DIAMETER (in):	2"	PURGE RATE (gpm):	0.24 LPM
WELL DEPTH, TOTAL (ft):	50.42	PURGE START TIME:	0834
DEPTH TO WATER (toc):	44.03 DATE: 10/29/20	PURGE END TIME:	0934
WATER COLUMN HEIGHT (ft):	6.39	SAMPLING BEGIN / END TIME:	0935 /
WELL VOLUME (gal):		PUMP ID #:	WATER LEVEL ID #:

VOLUME CONVERSION FACTOR: .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	0834	280	8.62	0.634	1.98	6.12	202	898	44.01
2	0839	1140	8.89	0.616	1.23	6.57	103	685	44.0
3	0844	2000	9.01	0.607	1.07	6.76	69	528	43.98
4	0849	4000	8.88	0.608	1.12	6.83	76	410	43.98
5	0854	5240	8.95	0.608	1.07	6.86	82	385	43.99
6	0859	6700	8.86	0.611	1.04	6.83	87	374	43.99
7	0904	8240	8.89	0.612	1.04	6.87	90	339	44.01
8	0909	9600	8.96	0.611	1.08	6.89	92	294	44.00
9	0914	11000	8.84	0.612	1.08	6.89	91	222	44.01
10	0919	12240	8.73	0.614	1.08	6.85	97	171	44.01

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal):		VOC: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
# OF WELL VOLUMES PURGED:		GRO: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
STAB. TEMP (C):	COULD	DRO: ____ - 1 L amber glass w/HCL preserved (1 liter jar per sample)
STAB. Sp. CONDUCTIVITY:	NOT STABILIZE	SVOC: ____ - 1 L amber glass, unpreserved (1 liter jar per sample)
STAB. D.O.:		Diss. Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (field filtered)
STAB. pH:		Total Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (non-field filtered)
STAB. ORP:		Dioxins: ____ - 1 L amber glass, unpreserved (2 liter jars per sample)
STAB. TURBIDITY:		

SAMPLE TIME: 0935 SAMPLE FIELD FILTERED ?: Yes / (No)

FIELD BLANK? Yes / (No) (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) (name/time/comments):

MS/MSD? Yes / (No) (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: CLOUDY LIGHT BROWN ODOR: NONE

OBSERVATIONS: SET AP Pump @ 47FT BTOC. Bottom of

Sample tubing left in well at completion? (Yes or (No):

WEATHER DATA: TEMP.: 30° SKY: CLOUDY WIND: N 8MPH

IIII IIII IIII I

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-05	PURGE / SAMPLE METHOD :
CASING MATERIAL :	PUMP CONTROLLER SETTING:
WELL DIAMETER (in) :	PURGE RATE (gpm) :
WELL DEPTH, TOTAL (ft) :	PURGE START TIME :
DEPTH TO WATER (toc): DATE:	PURGE END TIME :
WATER COLUMN HEIGHT (ft):	SAMPLING BEGIN / END TIME : /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	0924	13600	8.68	0.615	0.91	6.87	96	138	44.01
2	0929	15160	8.62	0.615	0.89	6.92	100	112	44.01
3	0934	14400	8.69	0.615	0.81	6.89	[redacted]	95.7	44.01
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA	
TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS	
VOC: ____	- 40 ml vials w/HCL preserved (3 vials per sample)
GRO: ____	- 40 ml vials w/HCL preserved (3 vials per sample)
DRO: ____	- 1 L amber glass w/HCL preserved (1 liter jar per sample)
SVOC: ____	- 1 L amber glass, unpreserved (1 liter jar per sample)
Diss. Pb / As / Zn: ____	- 250 ml plastic w/HNO_3 preserved (field filtered)
Total Pb / As / Zn: ____	- 250 ml plastic w/HNO_3 preserved (non-field filtered)
Dioxins: ____	- 1 L amber glass, unpreserved (2 liter jars per sample)

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME: VADNAIS LANDFILL	PROJECT #:
ADDRESS:	SAMPLE ID: MW-6
CITY, STATE, ZIP:	DATE: 10/28/20
SAMPLER: ZACH MASON	ANALYTICAL LABORATORY: PACE
COMPANY: BAY WEST	CHAIN OF CUSTODY #:

WELL DATA	PURGE DATA
WELL NAME: MW-6	PURGE / SAMPLE METHOD: Bladder Pump
CASING MATERIAL: PVC	PUMP CONTROLLER SETTING: 2CPM; Pus=50#; Re=26 D:5
WELL DIAMETER (in): 2	PURGE RATE ~~(gpm)~~: 0.28 L/min + 0.18 L/min
WELL DEPTH, TOTAL (ft): 27.30	PURGE START TIME: 1037
DEPTH TO WATER (toc): 7.65 DATE: 10/28/20	PURGE END TIME: 1137
WATER COLUMN HEIGHT (ft): 19.65	SAMPLING BEGIN / END TIME: 1138 /
WELL VOLUME (gal): 3.15	PUMP ID #: WATER LEVEL ID #:

VOLUME CONVERSION FACTOR: .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ mL	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			±3%	±3%	10% or <0.5	±0.1	±10	±10% or <5	±0.3
1	1042	1580	12.20	1.30	2.94	7.04	89	23.1	8.29
2	1047	3000	12.08	1.27	3.66	6.88	98	35.2	8.72
3	1052	4400	11.91	1.24	3.97	6.73	112	36.1	9.08 *
4	1057	5580	11.77	1.24	4.33	6.75	122	37.3	9.40
5	1102	6700	11.61	1.24	4.60	6.73	131	34.0	9.60
6	1107	7600	11.50	1.25	4.70	6.71	136	31.4	9.83
7	1112	8500	11.40	1.27	4.90	6.70	139	27.9	10.09
8	1117	9300	11.28	1.29	4.96	6.68	141	25.6	10.43
9	1122	10000	11.19	1.32	5.04	6.68	141	21.5	10.70
10	1127	11000	11.12	1.35	4.97	6.64	141	18.5	10.97

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal):		VOC: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
# OF WELL VOLUMES PURGED:	COULD NOT STABILIZE	GRO: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
STAB. TEMP (C):		DRO: ____ - 1 L amber glass w/HCL preserved (1 liter jar per sample)
STAB. Sp. CONDUCTIVITY:		SVOC: ____ - 1 L amber glass, unpreserved (1 liter jar per sample)
STAB. D.O.:		Diss. Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (field filtered)
STAB. pH:		Total Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (non-field filtered)
STAB. ORP:		Dioxins: ____ - 1 L amber glass, unpreserved (2 liter jars per sample)
STAB. TURBIDITY:		

SAMPLE TIME: 1138 SAMPLE FIELD FILTERED ?: Yes / (No)

FIELD BLANK? Yes / (No) (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) (name/time/comments):

MS/MSD? Yes / (No) (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Tan ODOR: None

OBSERVATIONS: Set bottom of pump @ 22ft BTOC

* Changed flow rate from 0.28 L/m to 0.18 L/min b/c drawdown

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA: TEMP.: 36° F SKY: Cloudy WIND: SSW 6 mph

HH HH II

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-6	PURGE / SAMPLE METHOD :
CASING MATERIAL :	PUMP CONTROLLER SETTING:
WELL DIAMETER (in) :	PURGE RATE (gpm) :
WELL DEPTH, TOTAL (ft) :	PURGE START TIME :
DEPTH TO WATER (toc): DATE:	PURGE END TIME :
WATER COLUMN HEIGHT (ft):	SAMPLING BEGIN / END TIME : /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	1132	12100	10.95	1.38	9.99	6.67	134	15.7	11.22
2	1137	12920	10.91	1.41	9.89	6.63	133	14.2	11.45
3									
4									
5									
6									
7					V	Cmp			
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		VOC: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
# OF WELL VOLUMES PURGED:		GRO: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
STAB. TEMP (C) :	Could not stabilize due to Cond	DRO: ____ - 1 L amber glass w/HCL preserved (1 liter jar per sample)
STAB. Sp. CONDUCTIVITY :		SVOC: ____ - 1 L amber glass, unpreserved (1 liter jar per sample)
STAB. D.O. :		Diss. Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (field filtered)
STAB. pH :		Total Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (non-field filtered)
STAB. ORP :		Dioxins: ____ - 1 L amber glass, unpreserved (2 liter jars per sample)
STAB. TURBIDITY:		

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West — Customer-Focused Environmental & Industrial Solutions

PROJECT NAME: VADNAIS LANDFILL	PROJECT #: J200402
ADDRESS:	SAMPLE ID: SW27 - MW07
CITY, STATE, ZIP:	DATE: 10/28/20
SAMPLER: ~~ZACH~~ MASON	ANALYTICAL LABORATORY: PACE
COMPANY: BAY WEST	CHAIN OF CUSTODY #:

WELL DATA

WELL NAME: MW07	
CASING MATERIAL: PVC	
WELL DIAMETER (in): 2.0N	
WELL DEPTH, TOTAL (ft): 20.83	
DEPTH TO WATER (toc): 13.64 DATE: 10/28/2020	
WATER COLUMN HEIGHT (ft): 7.19	
WELL VOLUME (gal):	

PURGE DATA

PURGE / SAMPLE METHOD: BLADDER PUMP	
PUMP CONTROLLER SETTING: 2 LPM 40 PSI 20 REF. 100 SC	
PURGE RATE (gpm): 0.24	
PURGE START TIME: 1338	
PURGE END TIME: 1437	
SAMPLING BEGIN / END TIME: 1439 /	
PUMP ID #: WATER LEVEL ID #:	

VOLUME CONVERSION FACTOR: .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	1342	600	11.23	0.836	2.16	7.13	159	433	13.61
2	1347	1000	11.43	0.872	1.49	7.12	159	433	13.64
3	1352	1600	11.49	0.879	1.37	7.16	160	422	13.64
4	1357	~~2200~~ 2580	11.57	0.887	1.02	7.16	157	312	13.64
5	1402	~~3000~~ 3900	11.71	0.881	1.05	7.16	151	214	13.64
6	1407	5160	11.80	0.882	0.97	7.15	149	155	13.64
7	1412	6600	11.84	0.878	0.96	7.15	147	98	13.64
8	1417	7800	11.82	0.873	0.98	7.12	144	69	13.63
9	1422	8900	11.86	0.864	1.25	7.13	144	65	13.64
10	1427	10260	11.85	0.867	1.15	7.12	143	53.9	13.64

STABILIZATION DATA

TOTAL VOLUME (gal):	
# OF WELL VOLUMES PURGED:	COULD NOT STABILIZE
STAB. TEMP (C):	
STAB. Sp. CONDUCTIVITY:	
STAB. D.O.:	
STAB. pH:	
STAB. ORP:	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

VOC: ____	- 40 ml vials w/HCL preserved (3 vials per sample)
GRO: ____	- 40 ml vials w/HCL preserved (3 vials per sample)
DRO: ____	- 1 L amber glass w/HCL preserved (1 liter jar per sample)
SVOC: ____	- 1 L amber glass, unpreserved (1 liter jar per sample)
Diss. Pb / As / Zn: ____	- 250 ml plastic w/HNO_3 preserved (field filtered)
Total Pb / As / Zn: ____	- 250 ml plastic w/HNO_3 preserved (non-field filtered)
Dioxins: ____	- 1 L amber glass, unpreserved (2 liter jars per sample)

SAMPLE TIME: 1439 SAMPLE FIELD FILTERED ?: Yes / (No)

FIELD BLANK? Yes / (No) (name/time/comments):

DUPLICATE SAMPLE? Yes / ~~No~~ (name/time/comments):

MS/MSD? Yes / ~~No~~ (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: CLOUDY, LIGHT BROWN ODOR: NONE

OBSERVATIONS: SET BOTTOM OF PUMP @ 18.6 BTOC

Sample tubing left in well at completion? (Yes or (No)

WEATHER DATA: TEMP.: 40° SKY: SUNNY WIND: 6 mph SW

[redacted] 1111

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-07	PURGE / SAMPLE METHOD :
CASING MATERIAL :	PUMP CONTROLLER SETTING:
WELL DIAMETER (in) :	PURGE RATE (gpm) :
WELL DEPTH, TOTAL (ft) :	PURGE START TIME :
DEPTH TO WATER (toc): DATE:	PURGE END TIME :
WATER COLUMN HEIGHT (ft):	SAMPLING BEGIN / END TIME : /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	1432	11300	11.88	0.869	1.07	7.13	142	42.5	13.64
2	1437	12700	11.86	0.867	1.17	7.17	139	37.7	13.64
3									
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA	
TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

- VOC: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
- GRO: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
- DRO: ____ - 1 L amber glass w/HCL preserved (1 liter jar per sample)
- SVOC: ____ - 1 L amber glass, unpreserved (1 liter jar per sample)
- Diss. Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (field filtered)
- Total Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (non-field filtered)
- Dioxins: ____ - 1 L amber glass, unpreserved (2 liter jars per sample)

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME : VADNAIS LANDFILL	PROJECT # : J200407
ADDRESS :	SAMPLE ID: Sar27-MW-08
CITY, STATE, ZIP :	DATE: 10/30/20
SAMPLER : ZACH MASON	ANALYTICAL LABORATORY : DACE
COMPANY : BAYWEST	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-08	PURGE / SAMPLE METHOD : BLADDER
CASING MATERIAL : PVC	PUMP CONTROLLER SETTING: 2 GPM . 20 REFILL 10 DISCH.
WELL DIAMETER (in) : 2IN	PURGE RATE (gpm) : 0.26 GPM
WELL DEPTH, TOTAL (ft) : 17.28	PURGE START TIME : 0824
DEPTH TO WATER (toc): 10.41 DATE: 10/30/20	PURGE END TIME : 0924
WATER COLUMN HEIGHT (ft): 6.87	SAMPLING BEGIN / END TIME : 0925 /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters	NL		±	±	±	±	±	±	
1	0824	1260	9.99	1.20	2.07	6.70	-53	08	10.51
2	0829	1420	10.40	1.18	1.26	6.37	-52	0	10.72
3	0834	2700	10.53	1.22	1.20	6.40	-36	0	11.01
4	0839	4140	10.59	1.18	1.53	6.47	-36	0	11.16
5	0844	5600	10.56	1.19	0.67	6.44	-39	0	11.16
6	0849	7000	10.49	1.19	0.38	6.39	-41	0	11.16
7	0854	8440	10.41	1.19	0.43	6.38	-39	0	11.25
8	0859	9840	10.40	1.20	0.44	6.40	-42	0	11.27
9	0904	11440	10.39	1.20	0.45	6.37	-46	0	11.28
10	0909	12820	10.43	1.20	0.51	6.39	-51	0	11.42

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:	COULD	
STAB. TEMP (C) :	NOT STABILIZE	
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 0925 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) (name/time/comments):

MS/MSD? Yes / (No) (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: DARK BROWN, CLOUDY ODOR : NONE

OBSERVATIONS : SET BOTTOM OF PUMP @ 12.2 ft BTOC

- TURBIDITY TO HIGH TO REGISTER

Sample tubing left in well at completion? (Yes or (No)

WEATHER DATA : TEMP.: 29° SKY : PARTLY CLOUDY WIND : SE 1 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

ROJECT NAME :	PROJECT # :
ADDRESS :	SAMPLE ID:
CITY, STATE, ZIP :	DATE:
SAMPLER :	ANALYTICAL LABORATORY :
COMPANY :	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-08	PURGE / SAMPLE METHOD :
CASING MATERIAL :	PUMP CONTROLLER SETTING:
WELL DIAMETER (in) :	PURGE RATE (gpm) :
WELL DEPTH, TOTAL (ft) :	PURGE START TIME :
DEPTH TO WATER (toc): DATE:	PURGE END TIME :
WATER COLUMN HEIGHT (ft):	SAMPLING BEGIN / END TIME : /
WELL VOLUME (gal) :	PUMP ID # : WATER LEVEL ID # :

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal) mL	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters									
1	0914	14000	10.34	1.20	0.42	6.35	-53	0	11.33
2	0919	15440	10.35	1.20	0.23	6.40	-60	0	11.38
3	0924	16880	10.35	1.21	0.31	6.33	-62	0	11.45
4									
5									
6									
7									
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		VOC: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
# OF WELL VOLUMES PURGED:	COULD	GRO: ____ - 40 ml vials w/HCL preserved (3 vials per sample)
STAB. TEMP (C) :	NOT STABILIZE	DRO: ____ - 1 L amber glass w/HCL preserved (1 liter jar per sample)
STAB. Sp. CONDUCTIVITY :		SVOC: ____ - 1 L amber glass, unpreserved (1 liter jar per sample)
STAB. D.O. :		Diss. Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (field filtered)
STAB. pH :		Total Pb / As / Zn: ____ - 250 ml plastic w/HNO_3 preserved (non-field filtered)
STAB. ORP :		Dioxins: ____ - 1 L amber glass, unpreserved (2 liter jars per sample)
STAB. TURBIDITY:		

SAMPLE TIME : SAMPLE FIELD FILTERED ? : Yes / No

FIELD BLANK? Yes / No ? (name/time/comments):

DUPLICATE SAMPLE? Yes / No ? (name/time/comments):

MS/MSD? Yes / No ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: ODOR :

OBSERVATIONS :

Sample tubing left in well at completion? (Yes or No):

WEATHER DATA : TEMP.: SKY : WIND :

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME : Vadnais Heights Demolition Landfill	PROJECT # : J200402
ADDRESS : 655 County Rd F East	SAMPLE ID: 847409
CITY, STATE, ZIP : Vadnais Heights, MN 55127	DATE: 2/2/21
SAMPLER : John C. + Eric S.	ANALYTICAL LABORATORY :
COMPANY : BayWest	CHAIN OF CUSTODY # :

WELL DATA

WELL NAME : MW-1	
CASING MATERIAL : PVC	
WELL DIAMETER (in) : 2	
WELL DEPTH, TOTAL (ft) : 19.26	
DEPTH TO WATER (toc): 6.60 DATE: 2/2/21	
WATER COLUMN HEIGHT (ft): 12.66	
WELL VOLUME (gal) : 2.03	

PURGE DATA

PURGE / SAMPLE METHOD : Bladder Pump	
PUMP CONTROLLER SETTING:	gpm3, 14Rc, 60:, 10ps:
PURGE RATE (gpm) : 360 ml/m	
PURGE START TIME : 1554	
PURGE END TIME : 1714	
SAMPLING BEGIN / END TIME :	1715 / 1730
PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ (ml)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	1554	-	8.25	0.795	3.37	6.98	143	40.4	6.58
2	1604	1,940	6.36	0.838	0.96	6.96	129	29.1	6.59
3	1609	3,680	5.96	0.850	0.98	6.93	119	22.4	6.60
4	1614	5,160	5.73	0.932	0.80	6.87	115	17.9	6.60
5	1619	7,060	5.68	1.08	0.79	6.83	112	16.0	6.59
6	1624	8,940	5.62	1.12	0.75	6.82	101	14.8	6.60
7	1629	10,880	5.64	1.14	0.80	6.80	91	14.1	6.55
8	1634	12,800	5.56	1.15	0.85	6.80	79	13.2	6.55
9	1639	14,620	5.51	1.16	0.85	6.79	74	11.7	6.54
10	1644	16,560	5.36	1.17	0.62	6.80	70	13.0	6.53

STABILIZATION DATA

TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME : 1715

SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clear Light Brown / ODOR : None /

OBSERVATIONS : Set bottom of pump at 14 ft btoc. MP50 froze @ 1644. Restart @ 1659

No stabilization due to Turbidity, DO, Temp, @ 1644; Temp, DO, ORP, Turb @ 1714

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 24°F SKY : Partly Cloudy WIND : NW 6mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	847409
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/2/21
SAMPLER :	John C. + Eric S.	ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA

WELL NAME :	MW-1
CASING MATERIAL :	PVC
WELL DIAMETER (in) :	2
WELL DEPTH, TOTAL (ft) :	19.26
DEPTH TO WATER (toc):	6.60 DATE: 2/2/21
WATER COLUMN HEIGHT (ft):	12.66
WELL VOLUME (gal) :	2.03

PURGE DATA

PURGE / SAMPLE METHOD :	Bladder Pump
PUMP CONTROLLER SETTING:	3cpm, 14Re, 6D; 10psi
PURGE RATE (~~gpm~~) :	360 ml/m
PURGE START TIME :	1559
PURGE END TIME :	1714
SAMPLING BEGIN / END TIME :	1715 / 1730
PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			± 3%	± 3%	± 10% or < 0.5 mg/L	± 0.1	± 10 mV	± 10% or < 5 NTU	± 0.3 ft
1	1704	18,420	5.09	1.16	0.94	6.77	75	10.8	6.54
2	1709	20,280	5.18	1.18	0.82	6.79	68	10.3	6.54
3	1714	23,280	5.23	1.14	0.80	6.79	64	9.4	6.54
4									
5									
6									
7		ERS							
8		2/2/21							
9									
10									

STABILIZATION DATA

TOTAL VOLUME (gal) :	~~22,28~~
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME : 1715

SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Cl. Lgt Brown/ ODOR : None

OBSERVATIONS : Set bottom of pump @ 14 ft btoc. MP50 froze @ 1644. Restart @ 1659
No stabilization due to Turbidity, DO, Temp @ 1644; Temp, DO, ORP, Turb @ 1714

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 24°F SKY : Partly Cloudy WIND : NW 6 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

Page: 1 of 1

PROJECT NAME : Vadnais Heights Demolition Landfill	PROJECT # : J200402
ADDRESS : 655 County Rd F East	SAMPLE ID: 847410
CITY, STATE, ZIP : Vadnais Heights, MN 55127	DATE: 2/3/21
SAMPLER : John C. & Eric S.	ANALYTICAL LABORATORY :
COMPANY : BayWest	CHAIN OF CUSTODY # :

WELL DATA	PURGE DATA
WELL NAME : MW-2	PURGE / SAMPLE METHOD : Bladder Pump
CASING MATERIAL : PVC	PUMP CONTROLLER SETTING: 3cpm, 14Re, 6Di, 35psi
WELL DIAMETER (in) : 2	PURGE RATE ~~(gpm)~~ : 400 ml/m
WELL DEPTH, TOTAL (ft) : 20.41	PURGE START TIME : 0925
DEPTH TO WATER (toc): 7.85 DATE: 2/3/21	PURGE END TIME : 0955
WATER COLUMN HEIGHT (ft): 12.56	SAMPLING BEGIN / END TIME : 0958 / 1034
WELL VOLUME (gal) : 2.01	PUMP ID # : PFAS WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			± 3%	± 3%	± 10% or < 0.5 mg/L	± 0.1	± 10 mV	± 10% or < 5 NTU	± 0.3 ft
1	0925	-	7.73	1.04	17.31	6.57	146	86.1	~~6.85~~ 7.85
2	0930	1,900	6.19	1.21	0.87	6.42	52	72.1	7.83
3	0935	3,620	6.29	1.27	0.84	6.42	16	86.9	7.85
4	0940	5,640	6.25	1.30	0.71	6.44	11	85.1	7.83
5	0945	7,400	6.15	1.31	0.72	6.50	7	79.9	7.86
6	0950	9,260	6.04	1.31	0.77	6.54	4	79.2	7.85
7	0955	11,780	6.00	1.31	0.72	6.57	2	73.2	7.86
8									
9							2/3/21		
~~10~~									

STABILIZATION DATA	
TOTAL VOLUME ~~(gal)~~: mL	11780
# OF WELL VOLUMES PURGED:	—
STAB. TEMP (C) :	6.00
STAB. Sp. CONDUCTIVITY :	1.31
STAB. D.O. :	0.72
STAB. pH :	6.57
STAB. ORP :	2
STAB. TURBIDITY:	73.2

SAMPLE CONTAINERS

SAMPLE TIME : 958 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? (Yes) / No ? (name/time/comments): SW27-MW02-D / 1013

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Cloudy Pale Brown ODOR : None

OBSERVATIONS : Bottom of pump set @ 15 ft

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 20°F SKY : Mostly Sunny WIND : NW 9mph

HHHH

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	847406
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/1/21
SAMPLER :	JC & ES	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW-3	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	30PM; 16 Re; 9 Di
WELL DIAMETER (in) :	2	PURGE RATE ~~(gpm)~~ :	0.3 L/min → 0.21 L/min
WELL DEPTH, TOTAL (ft) :	17.28	PURGE START TIME :	1225
DEPTH TO WATER (toc):	3.97 DATE: 2/1/21	PURGE END TIME :	1310
WATER COLUMN HEIGHT (ft):	13.31	SAMPLING BEGIN / END TIME :	1311 / 1328
WELL VOLUME (gal) :	2.13	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ mL	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	1225	—	8.27	3.32	2.74	8.97	126	277	4.35
2	1230	1600	6.82	3.46	0	8.29	118	437	4.50
3	1235	2600	6.96	3.45	0	7.92	91	437	4.42
4	1240	3620	6.87	3.46	0	7.72	76	426	4.42
5	1245	4400	6.91	3.47	0	7.57 ~~7.70~~	65	409	4.34
6	1250	5920	6.91	3.48	0	7.48	61	245	4.39
7	1255	6770	6.91	3.49	0	7.40	58	208	4.36
8	1300	7650	6.87	3.50	0	7.31	55	188	4.38
9	1305	8540	7.02	3.51	0	7.28	52	184	4.37
10	1310	9560	8.95	3.52	0	7.25	49	174	4.38

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME ~~(gal)~~ : mL	9560	
# OF WELL VOLUMES PURGED:	→	
STAB. TEMP (C) :	6.95	
STAB. Sp. CONDUCTIVITY :	3.52	
STAB. D.O. :	0	
STAB. pH :	7.25	
STAB. ORP :	49	
STAB. TURBIDITY:	174	

SAMPLE TIME : 1311 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Dark Brown / Pale milky ODOR : None / None

OBSERVATIONS : set pump @ 12 ft (bottom of pump)

Changed from 0.3 L/min to 0.21 L/min b/c water level was decreasing

Sample tubing left in well at completion? (Yes or (No) :

WEATHER DATA : TEMP.: 27°F SKY : Cloudy WIND : WNW 5 mph

HH 1111

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	847411
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/3/21
SAMPLER :	JC + ES	ANALYTICAL LABORATORY :	
COMPANY :	Baywest	CHAIN OF CUSTODY # :	

WELL DATA

WELL NAME :	MW-4
CASING MATERIAL :	PVC
WELL DIAMETER (in) :	2
WELL DEPTH, TOTAL (ft) :	15.38
DEPTH TO WATER (toc):	7.49 DATE: 2/3/21
WATER COLUMN HEIGHT (ft):	7.89
WELL VOLUME (gal) :	1.26

PURGE DATA

PURGE / SAMPLE METHOD :	Bladder Pump
PUMP CONTROLLER SETTING:	2cpm, Re 2 6, D; 15psi
PURGE RATE ~~(gpm)~~ :	0.2 L/m
PURGE START TIME :	1506
PURGE END TIME :	1606
SAMPLING BEGIN / END TIME :	1607 / 1630
PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			± 3%	± 3%	± 10% or < 0.5 mg/L	± 0.1	± 10 mV	± 10% or < 5 NTU	± 0.3 ft
1	1506	-	8.81	2.05	16.68	7.02	140	578	7.67
2	1511	1,260	7.00	2.52	13.39	6.71	114	1,000+	7.90
3	1516	2,520	6.57	2.56	12.28	6.69	97	1,000+	8.42
4	1521	3,660	6.45	2.63	11.77	6.66	82	962	8.45
5	1526	4,680	6.45	2.69	11.21	6.65	66	827	8.49
6	1531	5,800	6.24	2.76	10.45	6.65	46	651	8.55
7	1536	6,900	6.26	2.82	9.75	6.66	29	480	8.60
8	1540	7,900	6.28	2.84	9.31	6.66	19	417	8.60
9	1546	8,900	6.23	2.85	8.75	6.65	12	390	8.65
10	1551	10,000	6.16	2.88	8.25	6.66	6	320	8.63

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 1607 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Opaque Brown / ODOR : None /

OBSERVATIONS : Bottom of pump set @ 13.5 ft. No stabilization due to ~~ORP, turbidity~~ DO

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 36°F SKY : Partly cloudy WIND : 16 mph NW

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	847411
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/3/21
SAMPLER :	JC+ES	ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA

WELL NAME :	MW04
CASING MATERIAL :	PVC
WELL DIAMETER (in) :	2
WELL DEPTH, TOTAL (ft) :	15.30
DEPTH TO WATER (toc):	7.49 DATE: 2/3/21
WATER COLUMN HEIGHT (ft):	7.89
WELL VOLUME (gal) :	1.26

PURGE DATA

PURGE / SAMPLE METHOD :	Bladder Pump
PUMP CONTROLLER SETTING:	2cpm, 2.6Re, 4Di, 15psi
PURGE RATE (gpm) :	0.2 L/m
PURGE START TIME :	1506
PURGE END TIME :	1606
SAMPLING BEGIN / END TIME :	1607 / 1630
PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			± 3%	± 3%	± 10% or < 0.5 mg/L	± 0.1	± 10 mV	± 10% or < 5 NTU	± 0.3 ft
1	1556	11,000	6.19	2.89	7.85	6.66	2	265	8.68
2	~~1601~~	12,140	6.21	2.90	7.46	6.66	-1	258	~~8.70~~ 8.70
3	1606	13,140	6.20	2.93	7.05	6.66	-4	262	8.68
4	~~1607~~								
5									
6									
7									
8		ERS							
9		2/3/21							
10									

STABILIZATION DATA

TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME : 1607

SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Opaque Brown ODOR : No odor

OBSERVATIONS : Bottom of pump set @ 13.5'. No Stabilization due to DO

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 36°F SKY : Partly Cloudy WIND : 16 mph NW

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854777
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/2/21
SAMPLER :	John C. + Eric S.	ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA

WELL NAME :	MW-5
CASING MATERIAL :	PVC
WELL DIAMETER (in) :	2
WELL DEPTH, TOTAL (ft) :	50.48
DEPTH TO WATER (toc):	44.52 DATE: 2/2/21
WATER COLUMN HEIGHT (ft):	5.96
WELL VOLUME (gal) :	0.95

PURGE DATA

PURGE / SAMPLE METHOD :	Bladder Pump
PUMP CONTROLLER SETTING:	3cpm, 14 Re, 6 Di, 80 psi
PURGE RATE (~~gpm~~) :	~~200 ml/m~~ 360 ml/m
PURGE START TIME :	1405
PURGE END TIME :	1505
SAMPLING BEGIN / END TIME :	1506 / 1521
PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (~~gal~~ ml)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			± 3%	± 3%	± 10% or < 0.5 mg/L	± 0.1	± 10 mV	± 10% or < 5 NTU	± 0.3 ft
1	~~1405~~	-	7.18	0.586	4.71	7.63	87	156	44.52
2	1410	1,000	6.57	0.587	1.15	~~6.34~~	57	141	44.50
3	1415	1,940	6.70	0.581	1.49	7.29	37	130	44.50
4	1420	3,000	6.73	0.581	1.74	7.26	37	146	44.50
~~5~~ 5	1425	4,780	6.91	0.579	1.71	7.27	45	190	44.52
6	1430	6,780	6.90	0.579	1.62	7.26	54	201	44.54
7	1435	8,280	6.84	0.579	1.47	~~6.84~~ 7.25	60	194	44.50
8	1440	9,900	6.88	0.579	1.40	7.25	64	157	44.51
9	1445	11,640	6.87	0.579	1.36	7.25	67	131	44.54
10	1450	13,400	6.85	0.580	1.28	7.25	69	115	44.52

STABILIZATION DATA

TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME : 1506

SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Palebrown. ODOR : None

OBSERVATIONS : Pump set @ 48ft. Started @ 2cpm, 20 Re, 10 Di, 70psi - bumped higher since water level remained constant @ 1425. No stabilization due to Turbidity, ~~DO, ORP~~

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 21°F SKY : Cloudy → mostly WIND : SE 7 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854777
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/2/21
SAMPLER :	John C. + Eric S.	ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW-5	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3gpm, 14Re, 60i, 80psi
WELL DIAMETER (in) :	2	PURGE RATE ~~(gpm)~~ :	360 ml/m
WELL DEPTH, TOTAL (ft) :	50.48	PURGE START TIME ~~1500~~	1405
DEPTH TO WATER (toc):	44.52 DATE: 2/2/21	PURGE END TIME :	1505
WATER COLUMN HEIGHT (ft):	5.96	SAMPLING BEGIN / END TIME :	1506 / 1521
WELL VOLUME (gal) :	0.95	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ ml	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	1455	15,280	6.86	0.580	1.16	7.24	71	86.6	44.50
2	~~1500~~	17,000	6.85	0.580	1.07	7.24	72	73.2	44.54
3	1505	18,780	6.84	0.580	1.04	7.26	73	61.5	44.54
4									
5									
6									
7		ERS							
8		2/2/21							
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 1506 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Pale brown ODOR : None

OBSERVATIONS : Pump set @ 48ft. Began @ 2gpm, 20Re, 10Di, 70psi → 3gpm, 14Re, 6Di, 80psi @ 1425. No stabilization due to turbidity

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 21°F SKY : mostly cloudy WIND : SE 7mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854580
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/2/21
SAMPLER :	John C. + Eric S.	ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW-6	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3cpm, ~~1Hz~~, 60i, 20psi
WELL DIAMETER (in) :	2	PURGE RATE ~~(gpm)~~ :	420ml/m
WELL DEPTH, TOTAL (ft) :	~~17.20~~ 27.31	PURGE START TIME :	11:09
DEPTH TO WATER (toc):	8.44 DATE: 2/2/21	PURGE END TIME :	12:09
WATER COLUMN HEIGHT (ft):	18.87	SAMPLING BEGIN / END TIME :	12:10 / 1232
WELL VOLUME (gal) :	3.02	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ ml	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	11:09	-	8.35	1.62	3.17	6.95	7	29.5	8.53
2	11:14	2,000	6.73	1.74	0.61	6.53	-30	40.5	9.00
3	11:19	3,500	6.47	1.74	0.89	6.50	-27	33.8	9.40
4	11:24	4,660	6.24	1.73	1.01	6.50	-24	30.1	9.82
5	11:29	5,900	5.97	1.74	1.32	6.50	-19	25.7	10.14
6	11:34	6,780	5.74	1.74	1.39	6.50	-14	24.3	10.51
7	11:39	7,580	5.62	1.75	1.45	6.49	-11	19.5	10.78
8	11:44	8,500	5.60	1.75	1.40	6.50	-9	16.9	10.95
9	11:49	9,500	5.66	1.75	1.47	6.50	-7	14.9	11.19
10	11:54	10,300	5.61	1.75	1.57	6.50	-5	13.5	11.39

STABILIZATION DATA	
TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME : 1210 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Pale brown / ODOR : None / ~~Strong~~

OBSERVATIONS : Pump set @ 22ft. No stabilization in Turbidity, ~~Temp, Water Level~~, DO

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 21°F SKY : Cloudy WIND : SE 7mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854580
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/2/21
SAMPLER :	John C. + Eric S.	ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	~~MW-8~~ MW-6	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	2cp, 25Re, 5Di, 20psi
WELL DIAMETER (in) :	2	PURGE RATE (~~gpm~~) :	180 ml/m
WELL DEPTH, TOTAL (ft) :	~~17~~ 27.31	PURGE START TIME :	11:09
DEPTH TO WATER (toc):	8.44 DATE: 2/2/21	PURGE END TIME :	12:09
WATER COLUMN HEIGHT (ft):	18.87	SAMPLING BEGIN / END TIME :	12:10 / 1232
WELL VOLUME (gal) :	3.02	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ ml	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	11:59	11,200	5.64	1.76	1.70	6.50	-2	11.3	11.64
2	12:04	12,000	5.64	1.76	1.77	6.51	0	10.4	11.88
3	12:09	12,940	5.70	1.76	1.98	6.51	3	9.9	12.07
4									
5									
6									
7		ERS							
8		2/2/21							
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :	~~5.70~~	
STAB. Sp. CONDUCTIVITY :	~~1.76~~	
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 1210 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS Clear

SAMPLE DESCRIPTION (Begin / End): COLOR: Palebrown / ~~Palebrown~~ ODOR : None / irony

OBSERVATIONS : Pump set @ 22ft. No stabilization due to DO, Turbidity, ~~Waterlevel~~

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 21°F SKY : Cloudy WIND : SE 7mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854578
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/3/21
SAMPLER :		ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA

WELL NAME :	MW.7
CASING MATERIAL :	PVC
WELL DIAMETER (in) :	2
WELL DEPTH, TOTAL (ft) :	20.84
DEPTH TO WATER (toc):	14.25 DATE: 2/3/21
WATER COLUMN HEIGHT (ft):	6.59
WELL VOLUME (gal) :	1.05

PURGE DATA

PURGE / SAMPLE METHOD :	Bladder Pump
PUMP CONTROLLER SETTING:	2cpm, 20Re, 10Di, 20psi
PURGE RATE ~~(gpm)~~:	260 ml/m
PURGE START TIME :	1148
PURGE END TIME :	1248
SAMPLING BEGIN / END TIME :	1249 / 1305
PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			± 3%	± 3%	± 10% or < 0.5 mg/L	± 0.1	± 10 mV	± 10% or < 5 NTU	± 0.3 ft
1	1148	-	4.50	0.884	3.8	6.85	69	35.5	14.14
2	1153	1,360	5.62	0.965	1.66	6.95	67	26.5	14.15
3	1158	2,700	5.87	0.967	1.31	6.99	68	24.0	14.18
4	1203	4,000	5.94	0.965	1.12	7.00	73	17.7	14.18
5	1208	5,560	6.00	0.963	1.05	6.99	76	14.2	14.19
6	1213	7,000	6.03	0.959	1.07	6.99	80	9.7	14.18
7	1218	8,400	6.03	0.958	1.13 1.12	6.98	83	8.3	14.15
8	1223	9,700	6.04	0.957 ~~1.17~~		6.98	85	7.3	14.17
9	1228	10,820	6.06	0.955	1.23	6.98	88	7.1	14.18
10	1233	12,000	6.09	0.954	1.30	7.00	91	6.2	14.17

STABILIZATION DATA	
TOTAL VOLUME (gal) :	
# OF WELL VOLUMES PURGED:	
STAB. TEMP (C) :	
STAB. Sp. CONDUCTIVITY :	
STAB. D.O. :	
STAB. pH :	
STAB. ORP :	
STAB. TURBIDITY:	

SAMPLE CONTAINERS

SAMPLE TIME : 1249 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? (Yes) / No ? (name/time/comments): SW27-FB01 / 1330

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clr Pale Brown ODOR : None

OBSERVATIONS : Pump Set @ 18 ft. No stabilization due to Turbidity

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 28°F SKY : Mostly Sunny WIND : NE 13mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854578
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/3/21
SAMPLER :		ANALYTICAL LABORATORY :	
COMPANY :		CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW07	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	2gpm, 20Re, 10D, 20ps
WELL DIAMETER (in) :	2	PURGE RATE (~~gpm~~) :	260 ml/m
WELL DEPTH, TOTAL (ft) :	20.84	PURGE START TIME :	1148
DEPTH TO WATER (toc):	14.25 DATE: 2/3/21	PURGE END TIME :	1248
WATER COLUMN HEIGHT (ft):	6.59	SAMPLING BEGIN / END TIME :	~~1148~~ 1249 / 1305
WELL VOLUME (gal) :	1.05	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME (gal)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	1238	13,180	6.09	0.954	1.43	6.99	93	5.3	14.18
2	1243	14,560	6.10	0.954	1.40	6.98	95	4.5	14.18
3	1248	15,820	6.11	0.953	1.48	7.00	98	4.5	14.18
4									
5									
6									
7		ERS							
8		2/3/21							
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 1249 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? (Yes) / No ? (name/time/comments): SW27-EB01 @ 1330

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Clr Pale Brown ODOR : No odor

OBSERVATIONS : Pump set @ 18'. No stabilization due to turbidity

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 28°F SKY : Mostly Sunny WIND : NE 13 mph

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854579
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	~~1/2/21~~ 2/1/21
SAMPLER :	John C. + Eric S.	ANALYTICAL LABORATORY :	
COMPANY :	Bay West	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW-8	PURGE / SAMPLE METHOD :	Bladder pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3cpm, 14Re, 16Di, 10PS
WELL DIAMETER (in) :	2	PURGE RATE (~~gpm~~) :	0.22 L/m
WELL DEPTH, TOTAL (ft) :	17.20	PURGE START TIME :	1504
DEPTH TO WATER (toc):	9.72 DATE: 2/1/21	PURGE END TIME :	1621
WATER COLUMN HEIGHT (ft):	7.48	SAMPLING BEGIN / END TIME :	1622 / 1640
WELL VOLUME (gal) :	1.2	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ (mL)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	1504	-	7.00	1.22	13.92	7.74	-11	1000+	9.85
2	1509	930	7.71	1.20	12.56	7.43	-32	1000+	10.10
3	1514	1940	7.71	1.20	11.55	7.33	-26	740	10.12
4	1519	2920	7.66	1.21	10.88	7.29	-24	500	10.20
5	1524	3880	7.82	1.21	10.06	7.25	-23	366	10.30
6	1529	5000	8.07	1.21	9.33	7.21	-22	314	10.34
7	1534	6500	8.20	1.21	8.74	7.18	-19	256	10.38
8	1539	-	-	-	-	-	-	-	-
9	1601	6,730	6.29	1.24	7.72	7.24	-17	133	9.98
10	1606	8,460	7.22	1.23	6.99	7.18	-22	116	10.10

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 1622 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes (No) ? (name/time/comments):

MS/MSD? Yes (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Cloudy brown / ODOR : Iron /

OBSERVATIONS : Pump set @ 15 ft

MPSO froze at 1539 & Restated at 1556

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 27°F SKY : Cloudy WIND : NNW 6mph

HH HH

FIELD SAMPLING DATA SHEET

Bay West
Customer-Focused Environmental & Industrial Solutions

PROJECT NAME :	Vadnais Heights Demolition Landfill	PROJECT # :	J200402
ADDRESS :	655 County Rd F East	SAMPLE ID:	854579
CITY, STATE, ZIP :	Vadnais Heights, MN 55127	DATE:	2/1/21
SAMPLER :	John C. + Eric S.	ANALYTICAL LABORATORY :	
COMPANY :	BayWest	CHAIN OF CUSTODY # :	

WELL DATA		PURGE DATA	
WELL NAME :	MW-8	PURGE / SAMPLE METHOD :	Bladder Pump
CASING MATERIAL :	PVC	PUMP CONTROLLER SETTING:	3cpm, 14Hz, 60i, 40psi
WELL DIAMETER (in) :	2	PURGE RATE ~~(gpm)~~ :	0.22 L/m
WELL DEPTH, TOTAL (ft) :	17.20	PURGE START TIME :	1504
DEPTH TO WATER (toc):	9.72 DATE: 2/1/21	PURGE END TIME :	1621
WATER COLUMN HEIGHT (ft):	7.48	SAMPLING BEGIN / END TIME :	1622 / 1640
WELL VOLUME (gal) :	1.2	PUMP ID # : PFAS	WATER LEVEL ID # : PFAS

VOLUME CONVERSION FACTOR : .16 - 2" .65 - 4" 1.47 - 6" 2.61 - 8"

STABILIZATION READINGS

READING #	TIME	VOLUME ~~(gal)~~ (mL)	TEMP (C)	COND (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	TURBIDITY (ntu)	WATER LEVEL (ft BTOC)
Stabilization Parameters			**± 3%**	**± 3%**	**± 10% or < 0.5 mg/L**	**± 0.1**	**± 10 mV**	**± 10% or < 5 NTU**	**± 0.3 ft**
1	1611	9,250	7.50	1.23	6.54	7.16	-23	104	10.17
2	1616	~~1080~~ 10080	7.49	1.23	6.17	7.15	-23	91.1	10.20
3	1621	10,920	7.53	1.23	5.82	7.15	-24	80.3	10.25
4									
5									
6	ERS 2/1/21								
7									
8									
9									
10									

STABILIZATION DATA		SAMPLE CONTAINERS
TOTAL VOLUME (gal) :		
# OF WELL VOLUMES PURGED:		
STAB. TEMP (C) :		
STAB. Sp. CONDUCTIVITY :		
STAB. D.O. :		
STAB. pH :		
STAB. ORP :		
STAB. TURBIDITY:		

SAMPLE TIME : 1622 SAMPLE FIELD FILTERED ? : Yes / (No)

FIELD BLANK? Yes / (No) ? (name/time/comments):

DUPLICATE SAMPLE? Yes / (No) ? (name/time/comments):

MS/MSD? Yes / (No) ? (name/time/comments):

COMMENTS

SAMPLE DESCRIPTION (Begin / End): COLOR: Cloudy Brown ODOR : Iron

OBSERVATIONS : Pump set @ 15'. MP-50 Froze @ 1539 + Restarted @ 1556

Sample tubing left in well at completion? (Yes or (No)):

WEATHER DATA : TEMP.: 27°F SKY : Cloudy WIND : NNW 6mph

LH/HH

Bay West
Customer-Focused Environmental & Industrial Solutions

GROUNDWATER GAUGING FORM

PROJECT NAME: SW#27 Vadnais Landfill
PROJECT NUMBER: J200402

DATE: 5-10-21
PERSONNEL: Ted Toeger
GW INDICATOR USED: TW # PEAS

Well ID	Time	Water Level	well depth ~~Product Level~~	Comments: (Missing Cover/Lock, Broken Ballards,etc.)
847409 MW-1	0850	5.87	19.26	no tubing
847410 MW-2	0855	7.49	20.40	no tubing
847406 MW-3	0900	3.52	17.29	no tubing
847411 MW-4	0905	6.64	15.20	no tubing
854577 MW-5	0915	44.89	50.40	no tubing
854580 MW-6	0925	5.99	27.30	no tubing
854578 MW-7	0935	13.61	20.84	no tubing
854579 MW-8	0945	6.08	17.00	no tubing

Bay West
Customer-Focused Environmental & Industrial Solutions

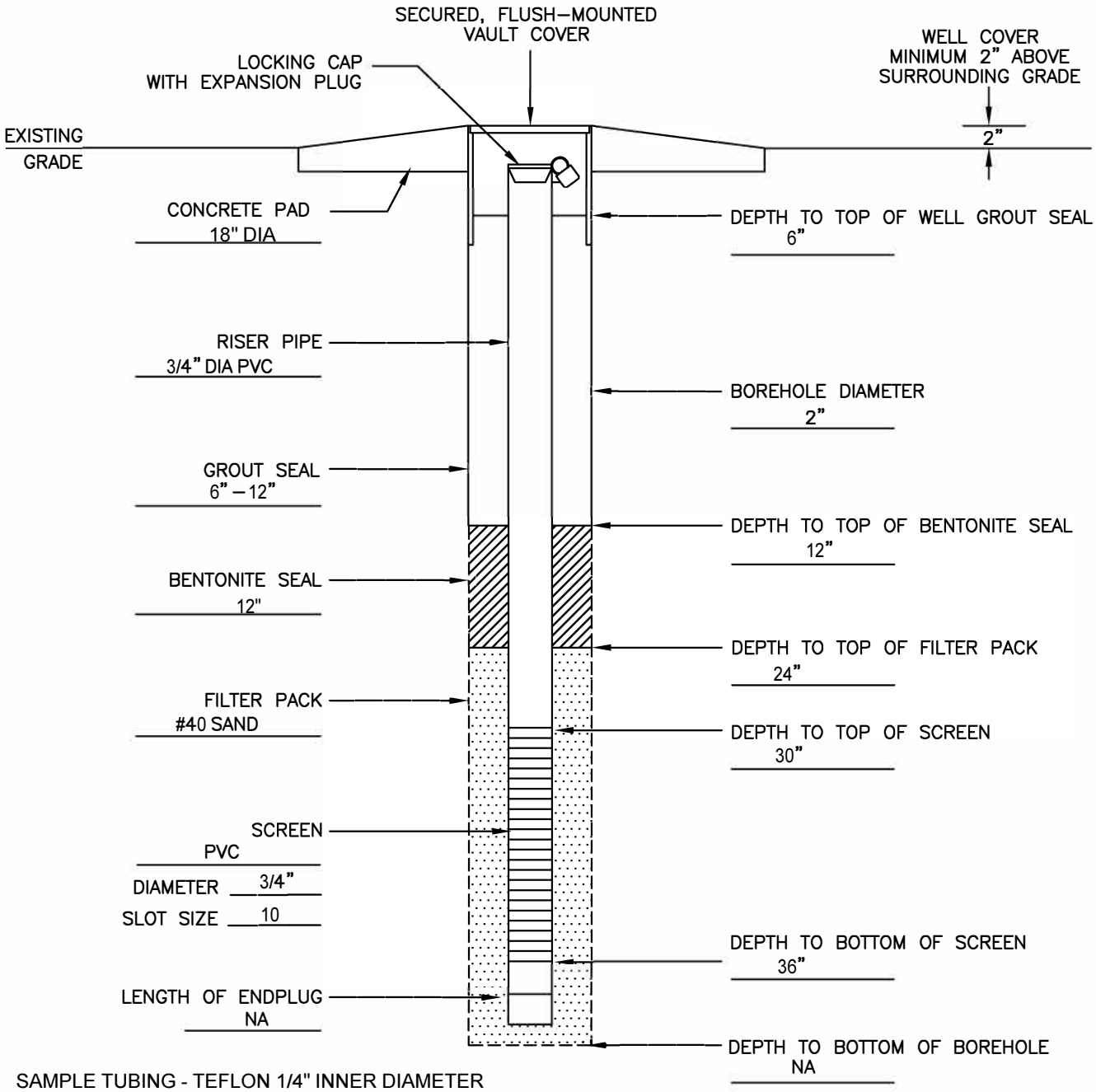
GROUNDWATER GAUGING FORM

PROJECT NAME: Vadnais Heights Demo Landfill
PROJECT NUMBER: J200402

DATE: 2/1/21
PERSONNEL: JC & CV
GW INDICATOR USED: TW # PFAS

Depth to bottom

Well ID	Time	Water Level	~~Product Level~~	~~Comments:~~ (Missing Cover/Lock, Broken Ballards,etc.)
MW-8	1040	9.72 ft	17.80 ft	
MW-4	1054	7.58	15.38	
MW-7	1102	14.35	20.84	
MW-1	1109	6.61	19.26	
MW-2	1116	8.03	20.41	
MW-5	1127	44.57	50.48	
MW-6	1140	8.45	27.31	
MW-3	1149	3.97	17.28	



DATE COMPLETED – 10/21/20

WELL IDENTIFICATION #– NA

SOIL BORING # – PSG-33

DRILLER – THEIN

GEOLOGIST – E NIMLOS

GEOLOGIST SIGNATURE– _____

GROUT SEAL MIXTURE:

_____ % BENTONITE _____ % CEMENT _____ % WATER

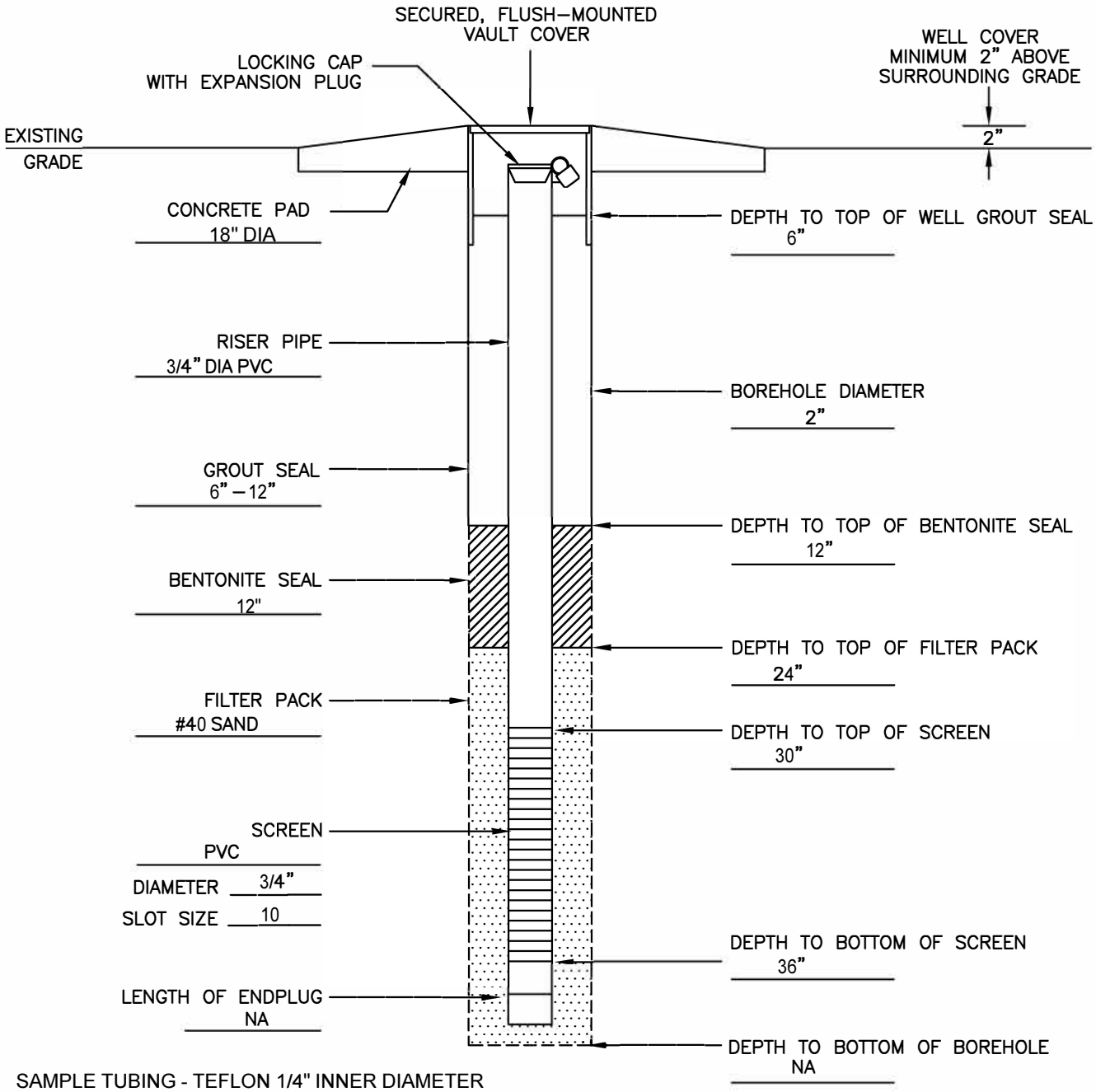
WELL LOCATION COORDINATES – _____

TOC ELEVATION– _____

GRADE ELEVATION – _____

STATIC WL ELEVATION– _____

PROJECT NAME FY21 SW#27 VADNAIS HEIGHTS DEMOLITION LANDFILL			ENGR'G	DATE	BAY WEST LLC ENVIRONMENTAL SERVICES ST. PAUL, MN
TITLE AT–GRADE PSG MONITORING CONSTRUCTION			DRAWN K.M.		
DWG. NO.	SCALE	FIGURE #	REV.		



DATE COMPLETED – 10/21/20

WELL IDENTIFICATION #– NA

SOIL BORING # – PSG-34

DRILLER – THEIN

GEOLOGIST – E NIMLOS

GEOLOGIST SIGNATURE– _____

GROUT SEAL MIXTURE:

_____ % BENTONITE _____ % CEMENT _____ % WATER

WELL LOCATION COORDINATES – _____

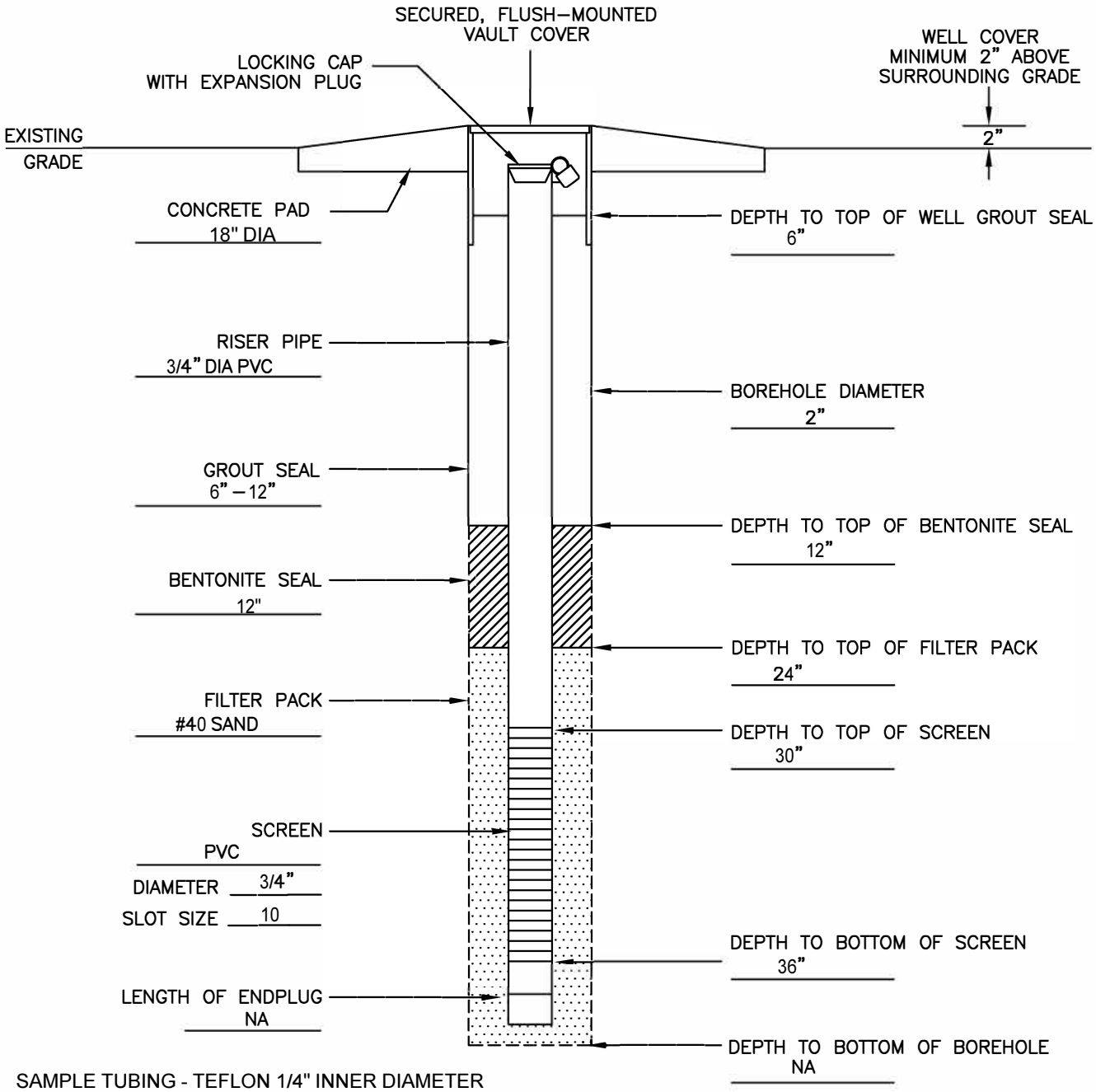
TOC ELEVATION– _____

GRADE ELEVATION – _____

STATIC WL ELEVATION– _____

PROJECT NAME FY21 SW#27 VADNAIS HEIGHTS DEMOLITION LANDFILL			ENGR'G	DATE
TITLE AT–GRADE PSG MONITORING CONSTRUCTION			DRAWN K.M.	
DWG. NO.	SCALE	FIGURE #	REV.	

BAY WEST LLC
ENVIRONMENTAL SERVICES
ST. PAUL, MN



DATE COMPLETED – 10/21/20

WELL IDENTIFICATION #– NA

SOIL BORING # – PSG-35

DRILLER – THEIN

GEOLOGIST – E NIMLOS

GEOLOGIST SIGNATURE– _____

GROUT SEAL MIXTURE:

_____ % BENTONITE _____ % CEMENT _____ % WATER

WELL LOCATION COORDINATES – _____

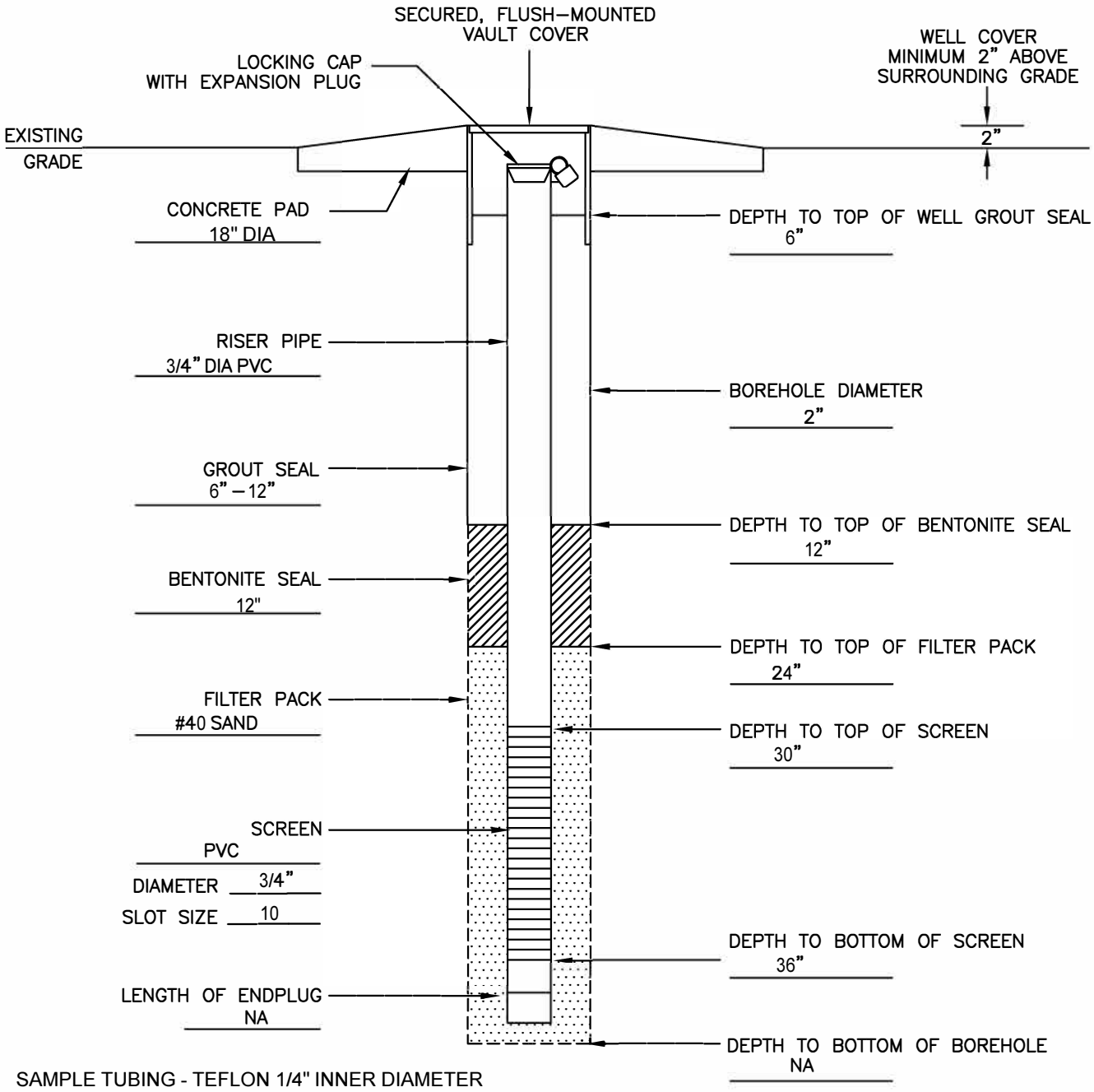
TOC ELEVATION– _____

GRADE ELEVATION – _____

STATIC WL ELEVATION– _____

PROJECT NAME FY21 SW#27 VADNAIS HEIGHTS DEMOLITION LANDFILL			ENGR'G	DATE
TITLE AT–GRADE PSG MONITORING CONSTRUCTION			DRAWN K.M.	
DWG. NO.	SCALE	FIGURE #	REV.	

BAY WEST LLC
ENVIRONMENTAL SERVICES
ST. PAUL, MN



SAMPLE TUBING - TEFLON 1/4" INNER DIAMETER

DATE COMPLETED – 10/21/20

WELL IDENTIFICATION #– NA

SOIL BORING # – PSG-36

DRILLER – THEIN

GEOLOGIST – E NIMLOS

GEOLOGIST SIGNATURE– _____

GROUT SEAL MIXTURE:

_____ % BENTONITE _____ % CEMENT _____ % WATER

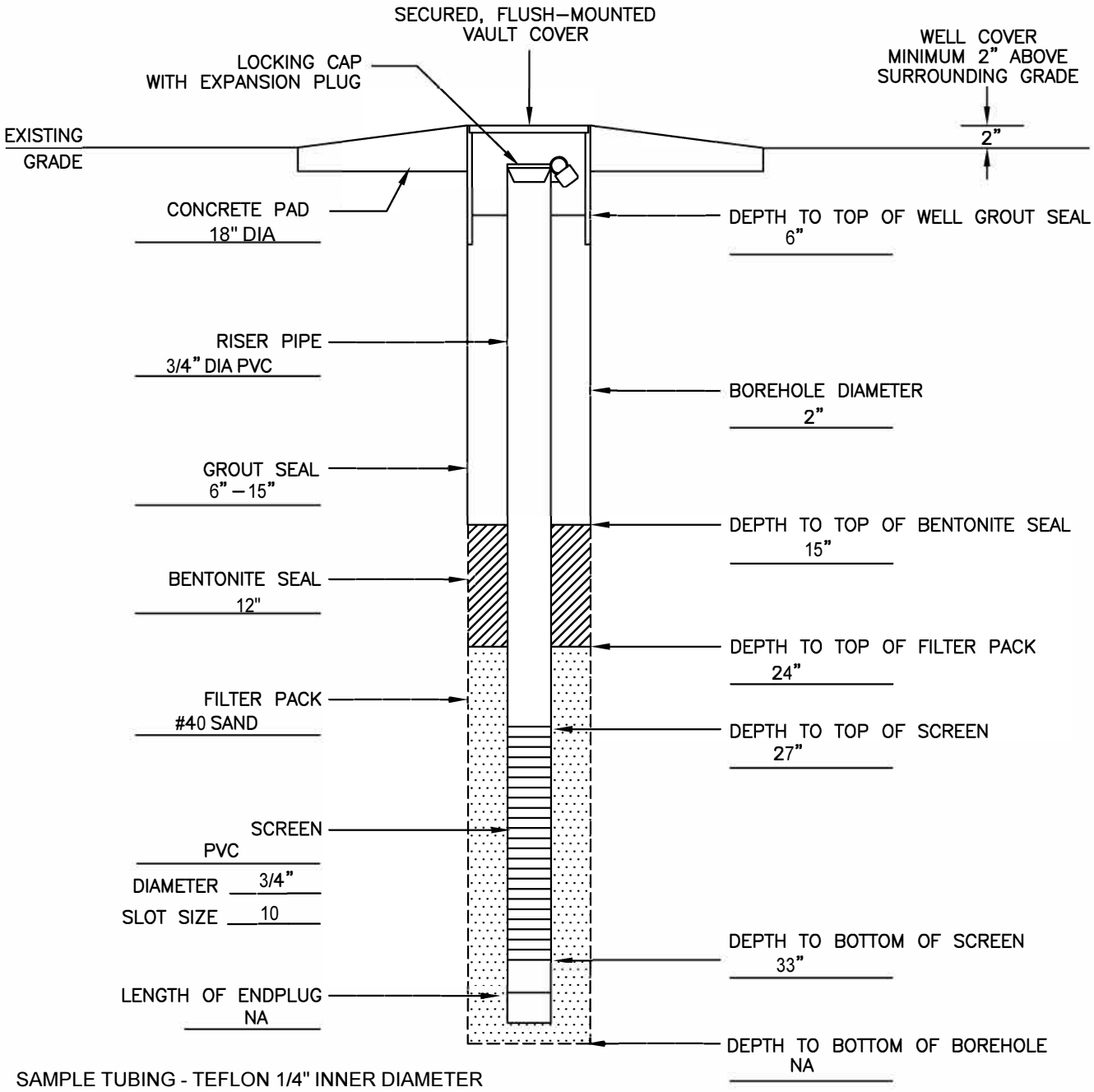
WELL LOCATION COORDINATES – _____

TOC ELEVATION– _____

GRADE ELEVATION – _____

STATIC WL ELEVATION– _____

PROJECT NAME FY21 SW#27 VADNAIS HEIGHTS DEMOLITION LANDFILL			ENGR'G	DATE	BAY WEST LLC ENVIRONMENTAL SERVICES ST. PAUL, MN
TITLE AT–GRADE PSG MONITORING CONSTRUCTION			DRAWN K.M.		
DWG. NO.	SCALE	FIGURE #	REV.		



DATE COMPLETED – 10/21/20

WELL IDENTIFICATION #– NA

SOIL BORING # – PSG-37

DRILLER – THEIN

GEOLOGIST – E NIMLOS

GEOLOGIST SIGNATURE– _____

GROUT SEAL MIXTURE:

_____ % BENTONITE _____ % CEMENT _____ % WATER

WELL LOCATION COORDINATES – _____

TOC ELEVATION– _____

GRADE ELEVATION – _____

STATIC WL ELEVATION– _____

PROJECT NAME FY21 SW#27 VADNAIS HEIGHTS DEMOLITION LANDFILL			ENGR'G	DATE
TITLE AT–GRADE PSG MONITORING CONSTRUCTION			DRAWN K.M.	
DWG. NO.	SCALE	FIGURE #	REV.	

BAY WEST LLC
ENVIRONMENTAL SERVICES
ST. PAUL, MN

Bay West
Customer-Focused Environmental & Industrial Solutions

SOIL GAS SAMPLING INFORMATION

Site Name VADNAIS HEIGHTS LANDFILL
Address
City/State VADNAIS, HEIGHTS

Staff STEFANIE M, ZACH M
Date 08/12/20
Temperature (°F) ~ 50°

Weather Conditions (Circle all that apply)

(Sunny) Partly Cloudy Overcast Rain

2.41 ml per foot of 1/8" OD tubing
38.61 mL per foot of 3/8" OD tubing
9.65 ml per foot of 1/4" OD tubing

Sample Name	Method Temp./Perm.	Installer	Sample Depth FT	Reason	Tubing Diameter (inches)	Tubing Length (ft)	Tubing Volume (ml)	Volume Extracted (ml)	Extraction Method	Pre Sample Summa Can Vac. (in. Hg)	Sample Duration (min)	VOC's PID Reading (ppm)	Post Sample Summa Can Vac. (in. Hg)	Comments (can #, time)
PSG37	PERM	THEIN	2.75	LANDFILL		2.75	650	650	SYRINGE	-30	10:14-10:57	0.0	-3	
PSG36	PERM	THEIN	3	LANDFILL		3.25	650	650	SYRINGE	-30	11:07-11:48	0.0	-3	
PSG35	PERM	THEIN	3	LANDFILL		3.25	650	650	SYRINGE	-28	11:12-11:55	0.0	-3	
PSG34	PERM	THEIN	3	LANDFILL		3.25	650	650	SYRINGE	NO SAMPLE		NO SAMPLE		
PSG33	PERM	THEIN	3	LANDFILL		3.25	650	650	SYRINGE	-29	9:50-10:31	0.0	-3	

10/16/20 Vadnais Heights

Gas Readings:

Sample ID: PSG33
Combo %LEL : 0%
%.02 : 16.3%
Can#: 1731
Reg#: 2699
CO : 0 ppm
VOC : 0.0 ppm
H_2S: 0 ppm

Pressure test: 0827 - 09:12
Pressure: -27 Hg

Sample time: 09:50 - 10:31
Sample Pressure - Start: -29 Stop: -3

Sample ID: PSG34 NO SAMPLE
Can#: 1487 water in line
Reg#: 16:28

Pressure test: 0841 - 0919
Pressure: -26 Hg
Sample time: Water in Line
Sample Pressure - Start: Stop: N/A

Scale: 1 square = _____

10/16/20 Vadnais Heights

Sample ID: PSG37 Gas readings
Combo LEL%: 5%
Can# 1487 O_2%: 12.8%
Reg# 1628 CO: 0 ppm
VOC's: 0.0 ppm
Pressure test: 09:54 - 10:13 H_2S: 0 ppm
Pressure: -24 Hg

Sample times: 10:14 - 10:57
Sample pressures: -30 start, -3 stop

Gas Readings
Sample ID: PSG36 %LEL 17.4
O_2%: 0%
Can# 1583 CO: 0 ppm
Reg# 1506 VOC's: 0.0 ppm
H_2S: 0 ppm

Pressure test: 10:53 @ -27 Hg
- 11:06

Sample time: 11:07 @ -30 Hg
11:48 @ -3 Hg

Scale: 1 square = _____

Rite in the Rain

10/16/20

Sample ID: PS635

Pressure Test: 10:53 - 11:11 @ -26
E.

Sample time: 11:12 @ -28
11:55 @ -3

Can #: 3675
Reg #: 2745

Gas Readings
LEL: 0
O_2: 20.4
CO: 0
VOCs: 0.0
H_2S: 0

Scale: 1 square = _____

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Laboratory Information		Section E MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landf	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order No.	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code	PRJ07786
Phone:	651-291-3493	Copy To:						Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

ITEM #	Location Unique ID	Sample Common ID	Start Depth ft	End Depth ft	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives	Requested Analysis: DRO with silica gel Cleanup WI DRO	Requested Analysis: 2,3,7,8 TCDD (Dioxin) EPA 1613B/8290A	Requested Analysis: PFAS MDH Guidance PFCs	Comments
1	2001007191	SB-16 (25-27.5)	25	27.5	Sample	G	SO	SD	Soil-Sub	10/13/20	0950	3		X			
2	2001007192	SB-17 (0-5)	0	5	Sample	G	SO	SD	Soil-Sub	10/13/20	1140	3		X			
3	2001007193	SB-18 (2.5-7.5)	2.5	7.5	Sample	G	SO	SD	Soil-Sub	10/12/20	1530	3		X			
4	854577	MW-05 (40-45)	40	45	Sample	G	SO	SD	Soil-Sub	10/13/20	1640	5		X	X	X	854577
5	~~854578~~	MW-05 (40-45) DUP	40	45	~~Sample~~ QC-FR	G	SO	SD	Soil-Sub	10/13/20	1645	5		X	X	X	—
6	854580	MW-06 (20-22.5)	20	22.5	Sample	G	SO	SD	Soil-Sub	10/14/20	1600	5		X	X	X	854580
7	854578	MW-07 (10-15)	10	15	Sample	G	SO	SD	Soil-Sub	10/15/20	1330	5		X	X	X	854578
8	854579	MW-08 (7.5-12.5)	7.5	12.5	~~SAMPLE~~ QC-FB	G	SO	SD	Soil-Sub	10/16/20	1000	5		X	X	X	854579
9		TRIP BLANK			QC-TB					10/13/20	0900	2		X	X	X	
10																	
11																	
12																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	STEF MAYER / BAYWEST	10/16/20	13:56		10-16-20	1356

SAMPLE CONDITIONS			
Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: STEF MAYER

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 10/16/20

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Laboratory Information		Section E MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Number	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:	tharsch@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: none	none	none	none	Requested Analysis: TCLP Semivolatiles (EPA 8270D/1311)	TCLP Metals (RCRA) - (EPA 6010C, 1311, 7470)	TCLP Pesticides (EPA 8081B/1311)	TCLP VOCs (EPA 8260B/1311)	Comments
1	~~FDAV01 TCLP~~ KB	FDAV01 TCLP	Sample	G	SO	SD	Soil-Sub	101620	~~1130~~ KB 1300	4	X	X	X	X					
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Kay Kiefer BayWest	10/16/20	13:55		10-16-20	1355	1.2 / Y / N / Y
							Temp (°C) / Received on Ice (Y/N) / Custody Sealed Cooler (Y/N) / Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kay Kiefer

SIGNATURE of SAMPLER: Kay Kiefer — DATE Signed (MM/DD/YY): 10/16/20

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Carlson-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A (Required Client Information)		Section B (Required Project Information)		Section C (Invoice Information)		Section D (Laboratory Information)		Section E (MPCA Information)	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfi	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	) Elm St. Minneapolis MN, 5	Work Order Number	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:	ryanR@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Gas-Soil= Soil Gas; Air-Ambnt= Ambient Air; Air-Indoor= Indoor Air

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	Date Start	Date End	Time Start	Time End	Start Pressure	End Pressure	Sample Type (G=GRAB C=COMP)	Lab Matrix Code	Field Matrix Code	Can #	Reg. #	# of Containers	Preservatives	Requested Analysis: TO-15	Requested Analysis: TO-3M (Methane)	Requested Analysis: TO-3C (Oxygen)	Comments
1	2001007194	PSG33	Sample	10/14/20	10/16/20	0950	1031	-29	-3	G	AR	Gas-Soil	1731	2491	1		x	x	x	
2	~~2001007195~~	~~PSG34~~	~~Sample~~	~~10/14/20~~	~~10/16/20~~					~~G~~	~~AR~~	~~Gas-Soil~~	~~1487~~	~~1628~~	~~1~~		x	x	x	OMIT MB
3	2001007196	PSG35	Sample	10/16/20	10/16/20	1112	1155	-28	-3	G	AR	Gas-Soil			1		x	x	x	
4	2001007197	PSG36	Sample	10/16/20	10/16/20	1107	1148	-30	-3	G	AR	Gas-Soil	1585	1506	1		x	x	x	
5	2001007198	PSG37	Sample	10/16/20	10/16/20	1014	1057	-30	-3	G	AR	Gas-Soil	1487	1628	1		x	x	x	
6																				
7																				
8																				
9																				
10																				
11																				
12																				

TO-15

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Kayla Bourcester / BW	10/16/20	13:56		10-16-20	1356	

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kayla Bourcester

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 10/16/20

Bay West
Customer-Focused Environmental & Industrial Solutions

Safety and Health Meeting Report (Tailgate)

Project Name	Vadnais Heights	Date	10/16/20
Project Number	J200402	Location	Vadnais Heights
Project Manager	Eric Nimlos	SSHO	Kaylen Bouchester
Today's Forecast	Partly Cloudy 40's	Duration	

Items Discussed

Notifications / PreWork

- ☐ Client
- ☐ Fire Dept
- ☐ Govt. Agency
- ☐ Field Supervisor
- ☐ One Call
- ☐ Police
- ☐ Work Cycles
- ☐ Land Owner
- ☐ LOTO
- ☐ Hot Work
- ☐ Confined Space
- ☐ ESP or ESS
- ☐ Work Zones
- ☐ AHAs

Tools / Equipment

- ☐ Four-wheeler
- ☒ Heavy Equip
- ☒ Hand Tools
- ☐ Vehicle Inspections
- ☒ Drill Rig
- ☐ Ladders
- ☐ Scaffolding
- ☐ Air Monitoring
- ☐ Ventilation
- ☐ Vacuum Truck
- ☐ Grounding Rod

Contingencies

- ☒ Hospital Map
- ☐ Fire
- ☐ Inclement Weather
- ☐ SDS
- ☐ Spill Kit
- ☐ First Aid Kit
- ☐ Eye Wash
- ☐ Stop Work

Chemical Hazards

- ☐ Corrosive
- ☒ VOCs
- ☐ SVOCs
- ☐ PCBs
- ☐ Heavy Metals
- ☐ Particulates
- ☐ Acute Toxics
- ☐ Asphyxiant
- ☐ Pesticides

Physical Hazards

- ☐ Confined Space
- ☐ Noise (>85dBA)
- ☐ Lighting
- ☐ Overhead Work
- ☐ Heat Stress
- ☒ Cold Stress
- ☒ Pinch Points
- ☒ Slips/Trips/Falls
- ☐ Distractions
- ☐ UXO
- ☐ Flammables
- ☐ Ergonomics

Radiological Hazards

- ☐ XRF
- ☐ DGM
- ☐ DU projectiles
- ☐ Solar Radiation

Biological Hazards

- ☐ Animals/Insects
- ☐ Biological Warfare Agents
- ☐ Infectious Materials

Personnel Requirements

- ☒ Competent Person
- ☒ Equipment Operator
- ☐ Medical Clearance
- ☐ Decon
- ☐ Incident Reports
- ☐ Eye Protection
- ☐ Foot Protection

Training

- ☐ Fall Protection
- ☐ Fire Ext
- ☐ PPE
- ☐ Site Specific
- ☐ HazCom
- ☐ Respirators
- ☐ Excavations
- ☐ Safe Lifting

Additional Safety Topics Discussed

Safety Concerns	Corrective Action(s)

Incidents / Near Misses from previous workday	Corrective Action(s)

I certify that to the best of my knowledge the above report is an accurate description of the items discussed at the tailgate safety meeting and that everyone on the *Employee/Subcontractors/Visitor Register* has received the safety brief for the date indicated.

Bay West

Customer-Focused Environmental & Industrial Solutions

Employee/Subcontractor/Visitor Register

Project Name	Vadnais Heights	Date	10/16/20
Project Number	J200402	Location	Vadnais Heights

Your signature below indicates that you were present, coherent, and responsive during the meeting, that you're aware of site specific hazards, and agree to stop work when an uncontrolled hazard presents itself.

Site Entry/Exit		Name (Printed)	Signature	Company
Time-in	Time-out			
7:00	13:30	Kayla Bannester		Bay West
0700	12:00	STEF MAYER		BAY WEST
8:15	12:30	Alvin Wiebe		Thein Well Co
8:15	12:30	Nathan Hembold		Thein Well Co

Revised – January 2017

Bay West
Customer-Focused Environmental & Industrial Solutions

SOIL GAS SAMPLING INFORMATION

Site Name VADNAIS HEIGHTS LANDFILL
Address 655 COUNTY RD F
City/State VADNAIS HEIGHTS, MN

Staff ZACH M, TED T
Date 3/12/21
Temperature (°F) 40°

Weather Conditions (Circle all that apply)

Sunny Partly Cloudy Overcast Rain

2.41 ml per foot of 1/8" OD tubing 9.65 ml per foot of 1/4" OD tubing
38.61 mL per foot of 3/8" OD tubing

Sample Name	Method Temp./Perm.	Installer	Sample Depth	Reason	Tubing Diameter (inches)	Tubing Length (ft)	Tubing Volume (ml)	Volume Extracted (ml)	Extraction Method	Pre Sample Summa Can Vac. (in. Hg)	Sample Duration (min)	PID Reading (ppm)	Post Sample Summa Can Vac. (in. Hg)	Comments (can #, time)
~~PSG-37~~	~~PERM~~	~~THEIN~~	~~2.5'~~		1/4	~~1.5'~~	~~14.47~~	~~43.42~~	~~SYRINGE~~					1669 fc 0931
~~PSG-36~~	~~PERM~~	THEIN	2.5		1/4	1.5	14.47	43.42	~~SYRINGE~~					3555 fc 0674
PSG-35	PERM	THEIN	2.5		1/4	1.5'	14.47	43.42	SYRINGE	-30	42MIN	0.0	-3	3881 fc1627

* PSG-37 COULD NOT SAMPLE DUE TO WATER IN LINE
PSG-36
PSG-35
PSG-34

Appendix C

2021 Laboratory Analytical Reports

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

October 30, 2020

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Lynch
colin.lynch@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Pace Analytical Services - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Massachusetts DWP Certification #: via MN 027-053-137
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10535875001	**PSG33**	Air	10/16/20 10:31	10/16/20 13:56
10535875002	**PSG33 Cert#1731**	Air	10/16/20 10:31	10/16/20 13:56
10535875003	**PSG35**	Air	10/16/20 11:55	10/16/20 13:56
10535875004	**PSG35 Cert#3675**	Air	10/16/20 11:55	10/16/20 13:56
10535875005	**PSG36**	Air	10/16/20 10:48	10/16/20 13:56
10535875006	**PSG36 Cert#1585**	Air	10/16/20 10:48	10/16/20 13:56
10535875007	**PSG37**	Air	10/16/20 10:57	10/16/20 13:56
10535875008	**PSG37 Cert#1487**	Air	10/16/20 10:57	10/16/20 13:56

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10535875001	**PSG33**	Method 3C Gases	AC1	1
		TO-15	AFV	61
		TO-3 Air	CH1	1
10535875002	**PSG33 Cert#1731**	TO-15	AFV	61
10535875003	**PSG35**	Method 3C Gases	AC1	1
		TO-15	AFV	61
		TO-3 Air	CH1	1
10535875004	**PSG35 Cert#3675**	TO-15	CH1	61
10535875005	**PSG36**	Method 3C Gases	AC1	1
		TO-15	AFV	61
		TO-3 Air	CH1	1
10535875006	**PSG36 Cert#1585**	TO-15	CH1	61
10535875007	**PSG37**	Method 3C Gases	AC1	1
		TO-15	AFV	61
		TO-3 Air	CH1	1
10535875008	**PSG37 Cert#1487**	TO-15	AFV	61

PASI-M = Pace Analytical Services - Minneapolis

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Date: October 30, 2020

PSG33 (Lab ID: 10535875001)

- Analysis performed at 1800 Elm Street.
- K1: The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

PSG35 (Lab ID: 10535875003)

- Analysis performed at 1800 Elm Street.
- K1: The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

PSG36 (Lab ID: 10535875005)

- Analysis performed at 1800 Elm Street.
- K1: The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

PSG37 (Lab ID: 10535875007)

- Analysis performed at 1800 Elm Street.
- K1: The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Method: **Method 3C Gases**
Description: Method 3C AIR - Fixed Gases
Client: Bay West LLC
Date: October 30, 2020

General Information:
4 samples were analyzed for Method 3C Gases by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Method: **TO-15**
Description: TO15 MSV AIR
Client: Bay West LLC
Date: October 30, 2020

General Information:
4 samples were analyzed for TO-15 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Method: **TO-15**
Description: Individual Can Certification
Client: Bay West LLC
Date: October 30, 2020

General Information:
4 samples were analyzed for TO-15 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Method: **TO-3 Air**
Description: TO3 GCV AIR Meth,Ethane,Ethene
Client: Bay West LLC
Date: October 30, 2020

General Information:
4 samples were analyzed for TO-3 Air by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG33 **Lab ID: 10535875001** Collected: 10/16/20 10:31 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Method 3C AIR - Fixed Gases	Analytical Method: Method 3C Gases Pace Analytical Services - Minneapolis								
Oxygen	**15.4**	%	2.0	0.15	1		10/22/20 11:37	7782-44-7	
TO15 MSV AIR	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Acetone	**16.6**	ug/m3	8.7	3.2	1.44		10/28/20 17:34	67-64-1	
Benzene	**0.53**	ug/m3	0.47	0.14	1.44		10/28/20 17:34	71-43-2	
Benzyl chloride	**<3.8**	ug/m3	3.8	1.9	1.44		10/28/20 17:34	100-44-7	
Bromodichloromethane	**<2.0**	ug/m3	2.0	0.31	1.44		10/28/20 17:34	75-27-4	
Bromoform	**<7.6**	ug/m3	7.6	1.2	1.44		10/28/20 17:34	75-25-2	
Bromomethane	**<1.1**	ug/m3	1.1	0.27	1.44		10/28/20 17:34	74-83-9	
1,3-Butadiene	**<0.65**	ug/m3	0.65	0.17	1.44		10/28/20 17:34	106-99-0	
2-Butanone (MEK)	**<4.3**	ug/m3	4.3	1.3	1.44		10/28/20 17:34	78-93-3	
Carbon disulfide	**1.6**	ug/m3	0.91	0.14	1.44		10/28/20 17:34	75-15-0	
Carbon tetrachloride	**<1.8**	ug/m3	1.8	0.31	1.44		10/28/20 17:34	56-23-5	
Chlorobenzene	**<1.3**	ug/m3	1.3	0.22	1.44		10/28/20 17:34	108-90-7	
Chloroethane	**<0.77**	ug/m3	0.77	0.21	1.44		10/28/20 17:34	75-00-3	
Chloroform	**<0.71**	ug/m3	0.71	0.22	1.44		10/28/20 17:34	67-66-3	
Chloromethane	**<0.60**	ug/m3	0.60	0.12	1.44		10/28/20 17:34	74-87-3	
Cyclohexane	**1.8J**	ug/m3	2.5	0.26	1.44		10/28/20 17:34	110-82-7	
Dibromochloromethane	**<2.5**	ug/m3	2.5	0.46	1.44		10/28/20 17:34	124-48-1	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	1.1	0.31	1.44		10/28/20 17:34	106-93-4	
1,2-Dichlorobenzene	**<1.8**	ug/m3	1.8	1.0	1.44		10/28/20 17:34	95-50-1	
1,3-Dichlorobenzene	**<1.8**	ug/m3	1.8	1.2	1.44		10/28/20 17:34	541-73-1	
1,4-Dichlorobenzene	**<4.4**	ug/m3	4.4	1.4	1.44		10/28/20 17:34	106-46-7	
Dichlorodifluoromethane	**2.4**	ug/m3	1.5	0.79	1.44		10/28/20 17:34	75-71-8	
1,1-Dichloroethane	**<1.2**	ug/m3	1.2	0.19	1.44		10/28/20 17:34	75-34-3	
1,2-Dichloroethane	**<0.59**	ug/m3	0.59	0.19	1.44		10/28/20 17:34	107-06-2	
1,1-Dichloroethene	**<1.2**	ug/m3	1.2	0.19	1.44		10/28/20 17:34	75-35-4	
cis-1,2-Dichloroethene	**<1.2**	ug/m3	1.2	0.20	1.44		10/28/20 17:34	156-59-2	
trans-1,2-Dichloroethene	**<1.2**	ug/m3	1.2	0.24	1.44		10/28/20 17:34	156-60-5	
1,2-Dichloropropane	**<1.4**	ug/m3	1.4	0.24	1.44		10/28/20 17:34	78-87-5	
cis-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.22	1.44		10/28/20 17:34	10061-01-5	
trans-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.25	1.44		10/28/20 17:34	10061-02-6	
Dichlorotetrafluoroethane	**<2.0**	ug/m3	2.0	0.35	1.44		10/28/20 17:34	76-14-2	
Ethanol	**7.6**	ug/m3	2.8	0.82	1.44		10/28/20 17:34	64-17-5	
Ethyl acetate	**<1.1**	ug/m3	1.1	0.16	1.44		10/28/20 17:34	141-78-6	
Ethylbenzene	**1.1J**	ug/m3	1.3	0.21	1.44		10/28/20 17:34	100-41-4	
4-Ethyltoluene	**<3.6**	ug/m3	3.6	0.31	1.44		10/28/20 17:34	622-96-8	
n-Heptane	**<1.2**	ug/m3	1.2	0.22	1.44		10/28/20 17:34	142-82-5	
Hexachloro-1,3-butadiene	**<7.8**	ug/m3	7.8	2.8	1.44		10/28/20 17:34	87-68-3	
n-Hexane	**2.8**	ug/m3	1.0	0.31	1.44		10/28/20 17:34	110-54-3	
2-Hexanone	**<6.0**	ug/m3	6.0	1.0	1.44		10/28/20 17:34	591-78-6	
Methylene Chloride	**4.3J**	ug/m3	5.1	1.8	1.44		10/28/20 17:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	**3.7J**	ug/m3	6.0	0.15	1.44		10/28/20 17:34	108-10-1	
Methyl-tert-butyl ether	**<5.3**	ug/m3	5.3	0.19	1.44		10/28/20 17:34	1634-04-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG33 **Lab ID: 10535875001** Collected: 10/16/20 10:31 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
	Pace Analytical Services - Minneapolis								
Naphthalene	**<3.8**	ug/m3	3.8	2.7	1.44		10/28/20 17:34	91-20-3	
2-Propanol	**<3.6**	ug/m3	3.6	1.2	1.44		10/28/20 17:34	67-63-0	
Propylene	**3.3**	ug/m3	0.50	0.35	1.44		10/28/20 17:34	115-07-1	
Styrene	**<1.2**	ug/m3	1.2	0.35	1.44		10/28/20 17:34	100-42-5	
1,1,2,2-Tetrachloroethane	**<1.0**	ug/m3	1.0	0.31	1.44		10/28/20 17:34	79-34-5	
Tetrachloroethene	**<0.99**	ug/m3	0.99	0.31	1.44		10/28/20 17:34	127-18-4	
Tetrahydrofuran	**3.8**	ug/m3	0.86	0.18	1.44		10/28/20 17:34	109-99-9	
Toluene	**4.3**	ug/m3	1.1	0.16	1.44		10/28/20 17:34	108-88-3	
1,2,4-Trichlorobenzene	**<10.9**	ug/m3	10.9	5.6	1.44		10/28/20 17:34	120-82-1	
1,1,1-Trichloroethane	**<1.6**	ug/m3	1.6	0.28	1.44		10/28/20 17:34	71-55-6	
1,1,2-Trichloroethane	**<0.80**	ug/m3	0.80	0.23	1.44		10/28/20 17:34	79-00-5	
Trichloroethene	**<0.79**	ug/m3	0.79	0.28	1.44		10/28/20 17:34	79-01-6	
Trichlorofluoromethane	**<1.6**	ug/m3	1.6	0.34	1.44		10/28/20 17:34	75-69-4	
1,1,2-Trichlorotrifluoroethane	**0.44J**	ug/m3	2.2	0.34	1.44		10/28/20 17:34	76-13-1	
1,2,4-Trimethylbenzene	**1.0J**	ug/m3	1.4	0.19	1.44		10/28/20 17:34	95-63-6	
1,3,5-Trimethylbenzene	**0.43J**	ug/m3	1.4	0.30	1.44		10/28/20 17:34	108-67-8	
Vinyl acetate	**<1.0**	ug/m3	1.0	0.16	1.44		10/28/20 17:34	108-05-4	
Vinyl chloride	**<0.37**	ug/m3	0.37	0.12	1.44		10/28/20 17:34	75-01-4	
m&p-Xylene	**3.0**	ug/m3	2.5	0.55	1.44		10/28/20 17:34	179601-23-1	
o-Xylene	**0.79J**	ug/m3	1.3	0.20	1.44		10/28/20 17:34	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
	Pace Analytical Services - Minneapolis								
Methane	**<72.0**	ppmv	72.0	15.3	1.44		10/25/20 15:57	74-82-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG33 Cert#1731 **Lab ID: 10535875002** Collected: 10/16/20 10:31 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Acetone	**<3.0**	ug/m3	3.0	0.88	0.5		09/17/20 04:15	67-64-1	
Benzene	**<0.16**	ug/m3	0.16	0.064	0.5		09/17/20 04:15	71-43-2	
Benzyl chloride	**<1.3**	ug/m3	1.3	0.16	0.5		09/17/20 04:15	100-44-7	
Bromodichloromethane	**<0.68**	ug/m3	0.68	0.13	0.5		09/17/20 04:15	75-27-4	
Bromoform	**<2.6**	ug/m3	2.6	0.70	0.5		09/17/20 04:15	75-25-2	
Bromomethane	**<0.39**	ug/m3	0.39	0.090	0.5		09/17/20 04:15	74-83-9	
1,3-Butadiene	**<0.22**	ug/m3	0.22	0.050	0.5		09/17/20 04:15	106-99-0	
2-Butanone (MEK)	**<1.5**	ug/m3	1.5	0.27	0.5		09/17/20 04:15	78-93-3	
Carbon disulfide	**<0.32**	ug/m3	0.32	0.098	0.5		09/17/20 04:15	75-15-0	
Carbon tetrachloride	**<0.64**	ug/m3	0.64	0.074	0.5		09/17/20 04:15	56-23-5	
Chlorobenzene	**<0.47**	ug/m3	0.47	0.076	0.5		09/17/20 04:15	108-90-7	
Chloroethane	**<0.27**	ug/m3	0.27	0.066	0.5		09/17/20 04:15	75-00-3	
Chloroform	**<0.25**	ug/m3	0.25	0.096	0.5		09/17/20 04:15	67-66-3	
Chloromethane	**0.12J**	ug/m3	0.21	0.048	0.5		09/17/20 04:15	74-87-3	
Cyclohexane	**<0.88**	ug/m3	0.88	0.11	0.5		09/17/20 04:15	110-82-7	
Dibromochloromethane	**<0.86**	ug/m3	0.86	0.15	0.5		09/17/20 04:15	124-48-1	
1,2-Dibromoethane (EDB)	**<0.39**	ug/m3	0.39	0.16	0.5		09/17/20 04:15	106-93-4	
1,2-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.19	0.5		09/17/20 04:15	95-50-1	
1,3-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.24	0.5		09/17/20 04:15	541-73-1	
1,4-Dichlorobenzene	**<1.5**	ug/m3	1.5	0.42	0.5		09/17/20 04:15	106-46-7	
Dichlorodifluoromethane	**<0.50**	ug/m3	0.50	0.075	0.5		09/17/20 04:15	75-71-8	
1,1-Dichloroethane	**<0.41**	ug/m3	0.41	0.063	0.5		09/17/20 04:15	75-34-3	
1,2-Dichloroethane	**<0.21**	ug/m3	0.21	0.089	0.5		09/17/20 04:15	107-06-2	
1,1-Dichloroethene	**<0.40**	ug/m3	0.40	0.072	0.5		09/17/20 04:15	75-35-4	
cis-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.080	0.5		09/17/20 04:15	156-59-2	
trans-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.084	0.5		09/17/20 04:15	156-60-5	
1,2-Dichloropropane	**<0.47**	ug/m3	0.47	0.085	0.5		09/17/20 04:15	78-87-5	
cis-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.11	0.5		09/17/20 04:15	10061-01-5	
trans-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.14	0.5		09/17/20 04:15	10061-02-6	
Dichlorotetrafluoroethane	**<0.71**	ug/m3	0.71	0.16	0.5		09/17/20 04:15	76-14-2	
Ethanol	**<0.96**	ug/m3	0.96	0.47	0.5		09/17/20 04:15	64-17-5	
Ethyl acetate	**<0.37**	ug/m3	0.37	0.084	0.5		09/17/20 04:15	141-78-6	
Ethylbenzene	**<0.44**	ug/m3	0.44	0.090	0.5		09/17/20 04:15	100-41-4	
4-Ethyltoluene	**<1.2**	ug/m3	1.2	0.24	0.5		09/17/20 04:15	622-96-8	
n-Heptane	**<0.42**	ug/m3	0.42	0.086	0.5		09/17/20 04:15	142-82-5	
Hexachloro-1,3-butadiene	**<2.7**	ug/m3	2.7	0.40	0.5		09/17/20 04:15	87-68-3	
n-Hexane	**<0.36**	ug/m3	0.36	0.12	0.5		09/17/20 04:15	110-54-3	
2-Hexanone	**<2.1**	ug/m3	2.1	0.18	0.5		09/17/20 04:15	591-78-6	
Methylene Chloride	**<1.8**	ug/m3	1.8	0.49	0.5		09/17/20 04:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	**<2.1**	ug/m3	2.1	0.10	0.5		09/17/20 04:15	108-10-1	
Methyl-tert-butyl ether	**<1.8**	ug/m3	1.8	0.069	0.5		09/17/20 04:15	1634-04-4	
Naphthalene	**<1.3**	ug/m3	1.3	0.62	0.5		09/17/20 04:15	91-20-3	
2-Propanol	**<1.2**	ug/m3	1.2	0.43	0.5		09/17/20 04:15	67-63-0	
Propylene	**<0.18**	ug/m3	0.18	0.049	0.5		09/17/20 04:15	115-07-1	
Styrene	**<0.43**	ug/m3	0.43	0.18	0.5		09/17/20 04:15	100-42-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG33 Cert#1731 **Lab ID: 10535875002** Collected: 10/16/20 10:31 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
1,1,2,2-Tetrachloroethane	**<0.35**	ug/m3	0.35	0.15	0.5		09/17/20 04:15	79-34-5	
Tetrachloroethene	**<0.34**	ug/m3	0.34	0.14	0.5		09/17/20 04:15	127-18-4	
Tetrahydrofuran	**<0.30**	ug/m3	0.30	0.085	0.5		09/17/20 04:15	109-99-9	
Toluene	**<0.38**	ug/m3	0.38	0.083	0.5		09/17/20 04:15	108-88-3	
1,2,4-Trichlorobenzene	**<3.8**	ug/m3	3.8	1.7	0.5		09/17/20 04:15	120-82-1	
1,1,1-Trichloroethane	**<0.56**	ug/m3	0.56	0.067	0.5		09/17/20 04:15	71-55-6	
1,1,2-Trichloroethane	**<0.28**	ug/m3	0.28	0.11	0.5		09/17/20 04:15	79-00-5	
Trichloroethene	**<0.27**	ug/m3	0.27	0.088	0.5		09/17/20 04:15	79-01-6	
Trichlorofluoromethane	**<0.57**	ug/m3	0.57	0.14	0.5		09/17/20 04:15	75-69-4	
1,1,2-Trichlorotrifluoroethane	**<0.78**	ug/m3	0.78	0.12	0.5		09/17/20 04:15	76-13-1	
1,2,4-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.20	0.5		09/17/20 04:15	95-63-6	
1,3,5-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.15	0.5		09/17/20 04:15	108-67-8	
Vinyl acetate	**<0.36**	ug/m3	0.36	0.088	0.5		09/17/20 04:15	108-05-4	
Vinyl chloride	**<0.13**	ug/m3	0.13	0.050	0.5		09/17/20 04:15	75-01-4	
m&p-Xylene	**<0.88**	ug/m3	0.88	0.21	0.5		09/17/20 04:15	179601-23-1	
o-Xylene	**<0.44**	ug/m3	0.44	0.097	0.5		09/17/20 04:15	95-47-6	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG35 **Lab ID: 10535875003** Collected: 10/16/20 11:55 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Method 3C AIR - Fixed Gases	Analytical Method: Method 3C Gases Pace Analytical Services - Minneapolis								
Oxygen	**19.7**	%	2.0	0.15	1		10/22/20 11:49	7782-44-7	
TO15 MSV AIR	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Acetone	**11.3**	ug/m3	8.4	3.1	1.39		10/28/20 18:33	67-64-1	
Benzene	**0.49**	ug/m3	0.45	0.14	1.39		10/28/20 18:33	71-43-2	
Benzyl chloride	**<3.7**	ug/m3	3.7	1.8	1.39		10/28/20 18:33	100-44-7	
Bromodichloromethane	**<1.9**	ug/m3	1.9	0.30	1.39		10/28/20 18:33	75-27-4	
Bromoform	**<7.3**	ug/m3	7.3	1.1	1.39		10/28/20 18:33	75-25-2	
Bromomethane	**<1.1**	ug/m3	1.1	0.26	1.39		10/28/20 18:33	74-83-9	
1,3-Butadiene	**<0.63**	ug/m3	0.63	0.16	1.39		10/28/20 18:33	106-99-0	
2-Butanone (MEK)	**<4.2**	ug/m3	4.2	1.2	1.39		10/28/20 18:33	78-93-3	
Carbon disulfide	**<0.88**	ug/m3	0.88	0.13	1.39		10/28/20 18:33	75-15-0	
Carbon tetrachloride	**<1.8**	ug/m3	1.8	0.30	1.39		10/28/20 18:33	56-23-5	
Chlorobenzene	**<1.3**	ug/m3	1.3	0.21	1.39		10/28/20 18:33	108-90-7	
Chloroethane	**<0.75**	ug/m3	0.75	0.20	1.39		10/28/20 18:33	75-00-3	
Chloroform	**<0.69**	ug/m3	0.69	0.21	1.39		10/28/20 18:33	67-66-3	
Chloromethane	**0.57J**	ug/m3	0.58	0.11	1.39		10/28/20 18:33	74-87-3	
Cyclohexane	**0.59J**	ug/m3	2.4	0.25	1.39		10/28/20 18:33	110-82-7	
Dibromochloromethane	**<2.4**	ug/m3	2.4	0.44	1.39		10/28/20 18:33	124-48-1	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	1.1	0.30	1.39		10/28/20 18:33	106-93-4	
1,2-Dichlorobenzene	**<1.7**	ug/m3	1.7	1.0	1.39		10/28/20 18:33	95-50-1	
1,3-Dichlorobenzene	**<1.7**	ug/m3	1.7	1.2	1.39		10/28/20 18:33	541-73-1	
1,4-Dichlorobenzene	**<4.3**	ug/m3	4.3	1.3	1.39		10/28/20 18:33	106-46-7	
Dichlorodifluoromethane	**2.7**	ug/m3	1.4	0.76	1.39		10/28/20 18:33	75-71-8	
1,1-Dichloroethane	**<1.1**	ug/m3	1.1	0.18	1.39		10/28/20 18:33	75-34-3	
1,2-Dichloroethane	**<0.57**	ug/m3	0.57	0.18	1.39		10/28/20 18:33	107-06-2	
1,1-Dichloroethene	**<1.1**	ug/m3	1.1	0.18	1.39		10/28/20 18:33	75-35-4	
cis-1,2-Dichloroethene	**<1.1**	ug/m3	1.1	0.19	1.39		10/28/20 18:33	156-59-2	
trans-1,2-Dichloroethene	**<1.1**	ug/m3	1.1	0.24	1.39		10/28/20 18:33	156-60-5	
1,2-Dichloropropane	**<1.3**	ug/m3	1.3	0.23	1.39		10/28/20 18:33	78-87-5	
cis-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.21	1.39		10/28/20 18:33	10061-01-5	
trans-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.24	1.39		10/28/20 18:33	10061-02-6	
Dichlorotetrafluoroethane	**<2.0**	ug/m3	2.0	0.34	1.39		10/28/20 18:33	76-14-2	
Ethanol	**13.1**	ug/m3	2.7	0.79	1.39		10/28/20 18:33	64-17-5	
Ethyl acetate	**<1.0**	ug/m3	1.0	0.15	1.39		10/28/20 18:33	141-78-6	
Ethylbenzene	**0.50J**	ug/m3	1.2	0.20	1.39		10/28/20 18:33	100-41-4	
4-Ethyltoluene	**<3.5**	ug/m3	3.5	0.30	1.39		10/28/20 18:33	622-96-8	
n-Heptane	**<1.2**	ug/m3	1.2	0.21	1.39		10/28/20 18:33	142-82-5	
Hexachloro-1,3-butadiene	**<7.5**	ug/m3	7.5	2.7	1.39		10/28/20 18:33	87-68-3	
n-Hexane	**1.3**	ug/m3	1.0	0.30	1.39		10/28/20 18:33	110-54-3	
2-Hexanone	**<5.8**	ug/m3	5.8	0.99	1.39		10/28/20 18:33	591-78-6	
Methylene Chloride	**2.4J**	ug/m3	4.9	1.8	1.39		10/28/20 18:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	**1.4J**	ug/m3	5.8	0.14	1.39		10/28/20 18:33	108-10-1	
Methyl-tert-butyl ether	**<5.1**	ug/m3	5.1	0.18	1.39		10/28/20 18:33	1634-04-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG35 **Lab ID: 10535875003** Collected: 10/16/20 11:55 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Naphthalene	**<3.7**	ug/m3	3.7	2.6	1.39		10/28/20 18:33	91-20-3	
2-Propanol	**<3.5**	ug/m3	3.5	1.2	1.39		10/28/20 18:33	67-63-0	
Propylene	**<0.49**	ug/m3	0.49	0.33	1.39		10/28/20 18:33	115-07-1	
Styrene	**<1.2**	ug/m3	1.2	0.33	1.39		10/28/20 18:33	100-42-5	
1,1,2,2-Tetrachloroethane	**<0.97**	ug/m3	0.97	0.30	1.39		10/28/20 18:33	79-34-5	
Tetrachloroethene	**<0.96**	ug/m3	0.96	0.30	1.39		10/28/20 18:33	127-18-4	
Tetrahydrofuran	**6.6**	ug/m3	0.83	0.18	1.39		10/28/20 18:33	109-99-9	
Toluene	**3.0**	ug/m3	1.1	0.16	1.39		10/28/20 18:33	108-88-3	
1,2,4-Trichlorobenzene	**<10.5**	ug/m3	10.5	5.4	1.39		10/28/20 18:33	120-82-1	
1,1,1-Trichloroethane	**<1.5**	ug/m3	1.5	0.27	1.39		10/28/20 18:33	71-55-6	
1,1,2-Trichloroethane	**<0.77**	ug/m3	0.77	0.22	1.39		10/28/20 18:33	79-00-5	
Trichloroethene	**<0.76**	ug/m3	0.76	0.27	1.39		10/28/20 18:33	79-01-6	
Trichlorofluoromethane	**1.3J**	ug/m3	1.6	0.33	1.39		10/28/20 18:33	75-69-4	
1,1,2-Trichlorotrifluoroethane	**0.54J**	ug/m3	2.2	0.32	1.39		10/28/20 18:33	76-13-1	
1,2,4-Trimethylbenzene	**0.30J**	ug/m3	1.4	0.19	1.39		10/28/20 18:33	95-63-6	
1,3,5-Trimethylbenzene	**<1.4**	ug/m3	1.4	0.28	1.39		10/28/20 18:33	108-67-8	
Vinyl acetate	**<1.0**	ug/m3	1.0	0.15	1.39		10/28/20 18:33	108-05-4	
Vinyl chloride	**<0.36**	ug/m3	0.36	0.12	1.39		10/28/20 18:33	75-01-4	
m&p-Xylene	**1.7J**	ug/m3	2.5	0.53	1.39		10/28/20 18:33	179601-23-1	
o-Xylene	**0.45J**	ug/m3	1.2	0.20	1.39		10/28/20 18:33	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air Pace Analytical Services - Minneapolis								
Methane	**<69.5**	ppmv	69.5	14.7	1.39		10/25/20 16:07	74-82-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG35 Cert#3675 **Lab ID: 10535875004** Collected: 10/16/20 11:55 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15								
	Pace Analytical Services - Minneapolis								
Acetone	**<3.0**	ug/m3	3.0	0.88	0.5		09/19/20 04:15	67-64-1	
Benzene	**<0.16**	ug/m3	0.16	0.064	0.5		09/19/20 04:15	71-43-2	
Benzyl chloride	**<1.3**	ug/m3	1.3	0.16	0.5		09/19/20 04:15	100-44-7	
Bromodichloromethane	**<0.68**	ug/m3	0.68	0.13	0.5		09/19/20 04:15	75-27-4	
Bromoform	**<2.6**	ug/m3	2.6	0.70	0.5		09/19/20 04:15	75-25-2	
Bromomethane	**<0.39**	ug/m3	0.39	0.090	0.5		09/19/20 04:15	74-83-9	
1,3-Butadiene	**<0.22**	ug/m3	0.22	0.050	0.5		09/19/20 04:15	106-99-0	
2-Butanone (MEK)	**<1.5**	ug/m3	1.5	0.27	0.5		09/19/20 04:15	78-93-3	
Carbon disulfide	**<0.32**	ug/m3	0.32	0.098	0.5		09/19/20 04:15	75-15-0	
Carbon tetrachloride	**<0.64**	ug/m3	0.64	0.074	0.5		09/19/20 04:15	56-23-5	
Chlorobenzene	**<0.47**	ug/m3	0.47	0.076	0.5		09/19/20 04:15	108-90-7	
Chloroethane	**<0.27**	ug/m3	0.27	0.066	0.5		09/19/20 04:15	75-00-3	
Chloroform	**<0.25**	ug/m3	0.25	0.096	0.5		09/19/20 04:15	67-66-3	
Chloromethane	**<0.21**	ug/m3	0.21	0.048	0.5		09/19/20 04:15	74-87-3	
Cyclohexane	**<0.88**	ug/m3	0.88	0.11	0.5		09/19/20 04:15	110-82-7	
Dibromochloromethane	**<0.86**	ug/m3	0.86	0.15	0.5		09/19/20 04:15	124-48-1	
1,2-Dibromoethane (EDB)	**<0.39**	ug/m3	0.39	0.16	0.5		09/19/20 04:15	106-93-4	
1,2-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.19	0.5		09/19/20 04:15	95-50-1	
1,3-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.24	0.5		09/19/20 04:15	541-73-1	
1,4-Dichlorobenzene	**<1.5**	ug/m3	1.5	0.42	0.5		09/19/20 04:15	106-46-7	
Dichlorodifluoromethane	**<0.50**	ug/m3	0.50	0.075	0.5		09/19/20 04:15	75-71-8	
1,1-Dichloroethane	**<0.41**	ug/m3	0.41	0.063	0.5		09/19/20 04:15	75-34-3	
1,2-Dichloroethane	**<0.21**	ug/m3	0.21	0.089	0.5		09/19/20 04:15	107-06-2	
1,1-Dichloroethene	**<0.40**	ug/m3	0.40	0.072	0.5		09/19/20 04:15	75-35-4	
cis-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.080	0.5		09/19/20 04:15	156-59-2	
trans-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.084	0.5		09/19/20 04:15	156-60-5	
1,2-Dichloropropane	**<0.47**	ug/m3	0.47	0.085	0.5		09/19/20 04:15	78-87-5	
cis-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.11	0.5		09/19/20 04:15	10061-01-5	
trans-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.14	0.5		09/19/20 04:15	10061-02-6	
Dichlorotetrafluoroethane	**<0.71**	ug/m3	0.71	0.16	0.5		09/19/20 04:15	76-14-2	
Ethanol	**<0.96**	ug/m3	0.96	0.47	0.5		09/19/20 04:15	64-17-5	
Ethyl acetate	**<0.37**	ug/m3	0.37	0.084	0.5		09/19/20 04:15	141-78-6	
Ethylbenzene	**<0.44**	ug/m3	0.44	0.090	0.5		09/19/20 04:15	100-41-4	
4-Ethyltoluene	**<1.2**	ug/m3	1.2	0.24	0.5		09/19/20 04:15	622-96-8	
n-Heptane	**<0.42**	ug/m3	0.42	0.086	0.5		09/19/20 04:15	142-82-5	
Hexachloro-1,3-butadiene	**<2.7**	ug/m3	2.7	0.40	0.5		09/19/20 04:15	87-68-3	
n-Hexane	**<0.36**	ug/m3	0.36	0.12	0.5		09/19/20 04:15	110-54-3	
2-Hexanone	**<2.1**	ug/m3	2.1	0.18	0.5		09/19/20 04:15	591-78-6	
Methylene Chloride	**0.67J**	ug/m3	1.8	0.49	0.5		09/19/20 04:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	**<2.1**	ug/m3	2.1	0.10	0.5		09/19/20 04:15	108-10-1	
Methyl-tert-butyl ether	**<1.8**	ug/m3	1.8	0.069	0.5		09/19/20 04:15	1634-04-4	
Naphthalene	**<1.3**	ug/m3	1.3	0.62	0.5		09/19/20 04:15	91-20-3	
2-Propanol	**<1.2**	ug/m3	1.2	0.43	0.5		09/19/20 04:15	67-63-0	
Propylene	**<0.18**	ug/m3	0.18	0.049	0.5		09/19/20 04:15	115-07-1	
Styrene	**<0.43**	ug/m3	0.43	0.18	0.5		09/19/20 04:15	100-42-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG35 Cert#3675 **Lab ID: 10535875004** Collected: 10/16/20 11:55 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
1,1,2,2-Tetrachloroethane	**<0.35**	ug/m3	0.35	0.15	0.5		09/19/20 04:15	79-34-5	
Tetrachloroethene	**<0.34**	ug/m3	0.34	0.14	0.5		09/19/20 04:15	127-18-4	
Tetrahydrofuran	**<0.30**	ug/m3	0.30	0.085	0.5		09/19/20 04:15	109-99-9	
Toluene	**<0.38**	ug/m3	0.38	0.083	0.5		09/19/20 04:15	108-88-3	
1,2,4-Trichlorobenzene	**<3.8**	ug/m3	3.8	1.7	0.5		09/19/20 04:15	120-82-1	
1,1,1-Trichloroethane	**<0.56**	ug/m3	0.56	0.067	0.5		09/19/20 04:15	71-55-6	
1,1,2-Trichloroethane	**<0.28**	ug/m3	0.28	0.11	0.5		09/19/20 04:15	79-00-5	
Trichloroethene	**<0.27**	ug/m3	0.27	0.088	0.5		09/19/20 04:15	79-01-6	
Trichlorofluoromethane	**<0.57**	ug/m3	0.57	0.14	0.5		09/19/20 04:15	75-69-4	
1,1,2-Trichlorotrifluoroethane	**<0.78**	ug/m3	0.78	0.12	0.5		09/19/20 04:15	76-13-1	
1,2,4-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.20	0.5		09/19/20 04:15	95-63-6	
1,3,5-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.15	0.5		09/19/20 04:15	108-67-8	
Vinyl acetate	**<0.36**	ug/m3	0.36	0.088	0.5		09/19/20 04:15	108-05-4	
Vinyl chloride	**<0.13**	ug/m3	0.13	0.050	0.5		09/19/20 04:15	75-01-4	
m&p-Xylene	**<0.88**	ug/m3	0.88	0.21	0.5		09/19/20 04:15	179601-23-1	
o-Xylene	**<0.44**	ug/m3	0.44	0.097	0.5		09/19/20 04:15	95-47-6	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG36 **Lab ID: 10535875005** Collected: 10/16/20 10:48 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Method 3C AIR - Fixed Gases	Analytical Method: Method 3C Gases Pace Analytical Services - Minneapolis								
Oxygen	**16.5**	%	2.0	0.15	1		10/22/20 12:01	7782-44-7	
TO15 MSV AIR	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Acetone	**10.4**	ug/m3	8.7	3.2	1.44		10/28/20 19:33	67-64-1	
Benzene	**0.99**	ug/m3	0.47	0.14	1.44		10/28/20 19:33	71-43-2	
Benzyl chloride	**<3.8**	ug/m3	3.8	1.9	1.44		10/28/20 19:33	100-44-7	
Bromodichloromethane	**<2.0**	ug/m3	2.0	0.31	1.44		10/28/20 19:33	75-27-4	
Bromoform	**<7.6**	ug/m3	7.6	1.2	1.44		10/28/20 19:33	75-25-2	
Bromomethane	**<1.1**	ug/m3	1.1	0.27	1.44		10/28/20 19:33	74-83-9	
1,3-Butadiene	**<0.65**	ug/m3	0.65	0.17	1.44		10/28/20 19:33	106-99-0	
2-Butanone (MEK)	**<4.3**	ug/m3	4.3	1.3	1.44		10/28/20 19:33	78-93-3	
Carbon disulfide	**3.2**	ug/m3	0.91	0.14	1.44		10/28/20 19:33	75-15-0	
Carbon tetrachloride	**<1.8**	ug/m3	1.8	0.31	1.44		10/28/20 19:33	56-23-5	
Chlorobenzene	**<1.3**	ug/m3	1.3	0.22	1.44		10/28/20 19:33	108-90-7	
Chloroethane	**<0.77**	ug/m3	0.77	0.21	1.44		10/28/20 19:33	75-00-3	
Chloroform	**<0.71**	ug/m3	0.71	0.22	1.44		10/28/20 19:33	67-66-3	
Chloromethane	**<0.60**	ug/m3	0.60	0.12	1.44		10/28/20 19:33	74-87-3	
Cyclohexane	**0.96J**	ug/m3	2.5	0.26	1.44		10/28/20 19:33	110-82-7	
Dibromochloromethane	**<2.5**	ug/m3	2.5	0.46	1.44		10/28/20 19:33	124-48-1	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	1.1	0.31	1.44		10/28/20 19:33	106-93-4	
1,2-Dichlorobenzene	**<1.8**	ug/m3	1.8	1.0	1.44		10/28/20 19:33	95-50-1	
1,3-Dichlorobenzene	**<1.8**	ug/m3	1.8	1.2	1.44		10/28/20 19:33	541-73-1	
1,4-Dichlorobenzene	**<4.4**	ug/m3	4.4	1.4	1.44		10/28/20 19:33	106-46-7	
Dichlorodifluoromethane	**2.4**	ug/m3	1.5	0.79	1.44		10/28/20 19:33	75-71-8	
1,1-Dichloroethane	**<1.2**	ug/m3	1.2	0.19	1.44		10/28/20 19:33	75-34-3	
1,2-Dichloroethane	**<0.59**	ug/m3	0.59	0.19	1.44		10/28/20 19:33	107-06-2	
1,1-Dichloroethene	**<1.2**	ug/m3	1.2	0.19	1.44		10/28/20 19:33	75-35-4	
cis-1,2-Dichloroethene	**<1.2**	ug/m3	1.2	0.20	1.44		10/28/20 19:33	156-59-2	
trans-1,2-Dichloroethene	**<1.2**	ug/m3	1.2	0.24	1.44		10/28/20 19:33	156-60-5	
1,2-Dichloropropane	**<1.4**	ug/m3	1.4	0.24	1.44		10/28/20 19:33	78-87-5	
cis-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.22	1.44		10/28/20 19:33	10061-01-5	
trans-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.25	1.44		10/28/20 19:33	10061-02-6	
Dichlorotetrafluoroethane	**<2.0**	ug/m3	2.0	0.35	1.44		10/28/20 19:33	76-14-2	
Ethanol	**4.4**	ug/m3	2.8	0.82	1.44		10/28/20 19:33	64-17-5	
Ethyl acetate	**<1.1**	ug/m3	1.1	0.16	1.44		10/28/20 19:33	141-78-6	
Ethylbenzene	**1.7**	ug/m3	1.3	0.21	1.44		10/28/20 19:33	100-41-4	
4-Ethyltoluene	**0.54J**	ug/m3	3.6	0.31	1.44		10/28/20 19:33	622-96-8	
n-Heptane	**<1.2**	ug/m3	1.2	0.22	1.44		10/28/20 19:33	142-82-5	
Hexachloro-1,3-butadiene	**<7.8**	ug/m3	7.8	2.8	1.44		10/28/20 19:33	87-68-3	
n-Hexane	**1.6**	ug/m3	1.0	0.31	1.44		10/28/20 19:33	110-54-3	
2-Hexanone	**<6.0**	ug/m3	6.0	1.0	1.44		10/28/20 19:33	591-78-6	
Methylene Chloride	**2.6J**	ug/m3	5.1	1.8	1.44		10/28/20 19:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	**1.2J**	ug/m3	6.0	0.15	1.44		10/28/20 19:33	108-10-1	
Methyl-tert-butyl ether	**<5.3**	ug/m3	5.3	0.19	1.44		10/28/20 19:33	1634-04-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG36 **Lab ID: 10535875005** Collected: 10/16/20 10:48 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
	Pace Analytical Services - Minneapolis								
Naphthalene	**<3.8**	ug/m3	3.8	2.7	1.44		10/28/20 19:33	91-20-3	
2-Propanol	**<3.6**	ug/m3	3.6	1.2	1.44		10/28/20 19:33	67-63-0	
Propylene	**<0.50**	ug/m3	0.50	0.35	1.44		10/28/20 19:33	115-07-1	
Styrene	**<1.2**	ug/m3	1.2	0.35	1.44		10/28/20 19:33	100-42-5	
1,1,2,2-Tetrachloroethane	**<1.0**	ug/m3	1.0	0.31	1.44		10/28/20 19:33	79-34-5	
Tetrachloroethene	**<0.99**	ug/m3	0.99	0.31	1.44		10/28/20 19:33	127-18-4	
Tetrahydrofuran	**3.9**	ug/m3	0.86	0.18	1.44		10/28/20 19:33	109-99-9	
Toluene	**9.8**	ug/m3	1.1	0.16	1.44		10/28/20 19:33	108-88-3	
1,2,4-Trichlorobenzene	**<10.9**	ug/m3	10.9	5.6	1.44		10/28/20 19:33	120-82-1	
1,1,1-Trichloroethane	**<1.6**	ug/m3	1.6	0.28	1.44		10/28/20 19:33	71-55-6	
1,1,2-Trichloroethane	**<0.80**	ug/m3	0.80	0.23	1.44		10/28/20 19:33	79-00-5	
Trichloroethene	**<0.79**	ug/m3	0.79	0.28	1.44		10/28/20 19:33	79-01-6	
Trichlorofluoromethane	**<1.6**	ug/m3	1.6	0.34	1.44		10/28/20 19:33	75-69-4	
1,1,2-Trichlorotrifluoroethane	**0.40J**	ug/m3	2.2	0.34	1.44		10/28/20 19:33	76-13-1	
1,2,4-Trimethylbenzene	**1.8**	ug/m3	1.4	0.19	1.44		10/28/20 19:33	95-63-6	
1,3,5-Trimethylbenzene	**0.87J**	ug/m3	1.4	0.30	1.44		10/28/20 19:33	108-67-8	
Vinyl acetate	**<1.0**	ug/m3	1.0	0.16	1.44		10/28/20 19:33	108-05-4	
Vinyl chloride	**<0.37**	ug/m3	0.37	0.12	1.44		10/28/20 19:33	75-01-4	
m&p-Xylene	**6.3**	ug/m3	2.5	0.55	1.44		10/28/20 19:33	179601-23-1	
o-Xylene	**2.2**	ug/m3	1.3	0.20	1.44		10/28/20 19:33	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
	Pace Analytical Services - Minneapolis								
Methane	**61.2J**	ppmv	72.0	15.3	1.44		10/25/20 16:16	74-82-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG36 Cert#1585 **Lab ID: 10535875006** Collected: 10/16/20 10:48 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Acetone	**<3.0**	ug/m3	3.0	0.88	0.5		09/19/20 02:48	67-64-1	
Benzene	**<0.16**	ug/m3	0.16	0.064	0.5		09/19/20 02:48	71-43-2	
Benzyl chloride	**<1.3**	ug/m3	1.3	0.16	0.5		09/19/20 02:48	100-44-7	
Bromodichloromethane	**<0.68**	ug/m3	0.68	0.13	0.5		09/19/20 02:48	75-27-4	
Bromoform	**<2.6**	ug/m3	2.6	0.70	0.5		09/19/20 02:48	75-25-2	
Bromomethane	**<0.39**	ug/m3	0.39	0.090	0.5		09/19/20 02:48	74-83-9	
1,3-Butadiene	**<0.22**	ug/m3	0.22	0.050	0.5		09/19/20 02:48	106-99-0	
2-Butanone (MEK)	**<1.5**	ug/m3	1.5	0.27	0.5		09/19/20 02:48	78-93-3	
Carbon disulfide	**<0.32**	ug/m3	0.32	0.098	0.5		09/19/20 02:48	75-15-0	
Carbon tetrachloride	**<0.64**	ug/m3	0.64	0.074	0.5		09/19/20 02:48	56-23-5	
Chlorobenzene	**<0.47**	ug/m3	0.47	0.076	0.5		09/19/20 02:48	108-90-7	
Chloroethane	**<0.27**	ug/m3	0.27	0.066	0.5		09/19/20 02:48	75-00-3	
Chloroform	**<0.25**	ug/m3	0.25	0.096	0.5		09/19/20 02:48	67-66-3	
Chloromethane	**<0.21**	ug/m3	0.21	0.048	0.5		09/19/20 02:48	74-87-3	
Cyclohexane	**<0.88**	ug/m3	0.88	0.11	0.5		09/19/20 02:48	110-82-7	
Dibromochloromethane	**<0.86**	ug/m3	0.86	0.15	0.5		09/19/20 02:48	124-48-1	
1,2-Dibromoethane (EDB)	**<0.39**	ug/m3	0.39	0.16	0.5		09/19/20 02:48	106-93-4	
1,2-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.19	0.5		09/19/20 02:48	95-50-1	
1,3-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.24	0.5		09/19/20 02:48	541-73-1	
1,4-Dichlorobenzene	**<1.5**	ug/m3	1.5	0.42	0.5		09/19/20 02:48	106-46-7	
Dichlorodifluoromethane	**<0.50**	ug/m3	0.50	0.075	0.5		09/19/20 02:48	75-71-8	
1,1-Dichloroethane	**<0.41**	ug/m3	0.41	0.063	0.5		09/19/20 02:48	75-34-3	
1,2-Dichloroethane	**<0.21**	ug/m3	0.21	0.089	0.5		09/19/20 02:48	107-06-2	
1,1-Dichloroethene	**<0.40**	ug/m3	0.40	0.072	0.5		09/19/20 02:48	75-35-4	
cis-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.080	0.5		09/19/20 02:48	156-59-2	
trans-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.084	0.5		09/19/20 02:48	156-60-5	
1,2-Dichloropropane	**<0.47**	ug/m3	0.47	0.085	0.5		09/19/20 02:48	78-87-5	
cis-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.11	0.5		09/19/20 02:48	10061-01-5	
trans-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.14	0.5		09/19/20 02:48	10061-02-6	
Dichlorotetrafluoroethane	**<0.71**	ug/m3	0.71	0.16	0.5		09/19/20 02:48	76-14-2	
Ethanol	**<0.96**	ug/m3	0.96	0.47	0.5		09/19/20 02:48	64-17-5	
Ethyl acetate	**<0.37**	ug/m3	0.37	0.084	0.5		09/19/20 02:48	141-78-6	
Ethylbenzene	**<0.44**	ug/m3	0.44	0.090	0.5		09/19/20 02:48	100-41-4	
4-Ethyltoluene	**<1.2**	ug/m3	1.2	0.24	0.5		09/19/20 02:48	622-96-8	
n-Heptane	**<0.42**	ug/m3	0.42	0.086	0.5		09/19/20 02:48	142-82-5	
Hexachloro-1,3-butadiene	**<2.7**	ug/m3	2.7	0.40	0.5		09/19/20 02:48	87-68-3	
n-Hexane	**<0.36**	ug/m3	0.36	0.12	0.5		09/19/20 02:48	110-54-3	
2-Hexanone	**<2.1**	ug/m3	2.1	0.18	0.5		09/19/20 02:48	591-78-6	
Methylene Chloride	**<1.8**	ug/m3	1.8	0.49	0.5		09/19/20 02:48	75-09-2	
4-Methyl-2-pentanone (MIBK)	**<2.1**	ug/m3	2.1	0.10	0.5		09/19/20 02:48	108-10-1	
Methyl-tert-butyl ether	**<1.8**	ug/m3	1.8	0.069	0.5		09/19/20 02:48	1634-04-4	
Naphthalene	**<1.3**	ug/m3	1.3	0.62	0.5		09/19/20 02:48	91-20-3	
2-Propanol	**<1.2**	ug/m3	1.2	0.43	0.5		09/19/20 02:48	67-63-0	
Propylene	**<0.18**	ug/m3	0.18	0.049	0.5		09/19/20 02:48	115-07-1	
Styrene	**<0.43**	ug/m3	0.43	0.18	0.5		09/19/20 02:48	100-42-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG36 Cert#1585 **Lab ID: 10535875006** Collected: 10/16/20 10:48 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
1,1,2,2-Tetrachloroethane	**<0.35**	ug/m3	0.35	0.15	0.5		09/19/20 02:48	79-34-5	
Tetrachloroethene	**<0.34**	ug/m3	0.34	0.14	0.5		09/19/20 02:48	127-18-4	
Tetrahydrofuran	**<0.30**	ug/m3	0.30	0.085	0.5		09/19/20 02:48	109-99-9	
Toluene	**<0.38**	ug/m3	0.38	0.083	0.5		09/19/20 02:48	108-88-3	
1,2,4-Trichlorobenzene	**<3.8**	ug/m3	3.8	1.7	0.5		09/19/20 02:48	120-82-1	
1,1,1-Trichloroethane	**<0.56**	ug/m3	0.56	0.067	0.5		09/19/20 02:48	71-55-6	
1,1,2-Trichloroethane	**<0.28**	ug/m3	0.28	0.11	0.5		09/19/20 02:48	79-00-5	
Trichloroethene	**<0.27**	ug/m3	0.27	0.088	0.5		09/19/20 02:48	79-01-6	
Trichlorofluoromethane	**<0.57**	ug/m3	0.57	0.14	0.5		09/19/20 02:48	75-69-4	
1,1,2-Trichlorotrifluoroethane	**<0.78**	ug/m3	0.78	0.12	0.5		09/19/20 02:48	76-13-1	
1,2,4-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.20	0.5		09/19/20 02:48	95-63-6	
1,3,5-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.15	0.5		09/19/20 02:48	108-67-8	
Vinyl acetate	**<0.36**	ug/m3	0.36	0.088	0.5		09/19/20 02:48	108-05-4	
Vinyl chloride	**<0.13**	ug/m3	0.13	0.050	0.5		09/19/20 02:48	75-01-4	
m&p-Xylene	**<0.88**	ug/m3	0.88	0.21	0.5		09/19/20 02:48	179601-23-1	
o-Xylene	**<0.44**	ug/m3	0.44	0.097	0.5		09/19/20 02:48	95-47-6	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG37 **Lab ID: 10535875007** Collected: 10/16/20 10:57 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Method 3C AIR - Fixed Gases	Analytical Method: Method 3C Gases Pace Analytical Services - Minneapolis								
Oxygen	**11.9**	%	2.0	0.15	1		10/22/20 12:12	7782-44-7	
TO15 MSV AIR	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Acetone	**11.9**	ug/m3	8.4	3.1	1.39		10/28/20 20:02	67-64-1	
Benzene	**0.36J**	ug/m3	0.45	0.14	1.39		10/28/20 20:02	71-43-2	
Benzyl chloride	**<3.7**	ug/m3	3.7	1.8	1.39		10/28/20 20:02	100-44-7	
Bromodichloromethane	**<1.9**	ug/m3	1.9	0.30	1.39		10/28/20 20:02	75-27-4	
Bromoform	**<7.3**	ug/m3	7.3	1.1	1.39		10/28/20 20:02	75-25-2	
Bromomethane	**<1.1**	ug/m3	1.1	0.26	1.39		10/28/20 20:02	74-83-9	
1,3-Butadiene	**<0.63**	ug/m3	0.63	0.16	1.39		10/28/20 20:02	106-99-0	
2-Butanone (MEK)	**2.1J**	ug/m3	4.2	1.2	1.39		10/28/20 20:02	78-93-3	
Carbon disulfide	**<0.88**	ug/m3	0.88	0.13	1.39		10/28/20 20:02	75-15-0	
Carbon tetrachloride	**<1.8**	ug/m3	1.8	0.30	1.39		10/28/20 20:02	56-23-5	
Chlorobenzene	**<1.3**	ug/m3	1.3	0.21	1.39		10/28/20 20:02	108-90-7	
Chloroethane	**<0.75**	ug/m3	0.75	0.20	1.39		10/28/20 20:02	75-00-3	
Chloroform	**0.78**	ug/m3	0.69	0.21	1.39		10/28/20 20:02	67-66-3	
Chloromethane	**<0.58**	ug/m3	0.58	0.11	1.39		10/28/20 20:02	74-87-3	
Cyclohexane	**0.68J**	ug/m3	2.4	0.25	1.39		10/28/20 20:02	110-82-7	
Dibromochloromethane	**<2.4**	ug/m3	2.4	0.44	1.39		10/28/20 20:02	124-48-1	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	1.1	0.30	1.39		10/28/20 20:02	106-93-4	
1,2-Dichlorobenzene	**<1.7**	ug/m3	1.7	1.0	1.39		10/28/20 20:02	95-50-1	
1,3-Dichlorobenzene	**<1.7**	ug/m3	1.7	1.2	1.39		10/28/20 20:02	541-73-1	
1,4-Dichlorobenzene	**<4.3**	ug/m3	4.3	1.3	1.39		10/28/20 20:02	106-46-7	
Dichlorodifluoromethane	**2.3**	ug/m3	1.4	0.76	1.39		10/28/20 20:02	75-71-8	
1,1-Dichloroethane	**<1.1**	ug/m3	1.1	0.18	1.39		10/28/20 20:02	75-34-3	
1,2-Dichloroethane	**<0.57**	ug/m3	0.57	0.18	1.39		10/28/20 20:02	107-06-2	
1,1-Dichloroethene	**<1.1**	ug/m3	1.1	0.18	1.39		10/28/20 20:02	75-35-4	
cis-1,2-Dichloroethene	**<1.1**	ug/m3	1.1	0.19	1.39		10/28/20 20:02	156-59-2	
trans-1,2-Dichloroethene	**<1.1**	ug/m3	1.1	0.24	1.39		10/28/20 20:02	156-60-5	
1,2-Dichloropropane	**<1.3**	ug/m3	1.3	0.23	1.39		10/28/20 20:02	78-87-5	
cis-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.21	1.39		10/28/20 20:02	10061-01-5	
trans-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.24	1.39		10/28/20 20:02	10061-02-6	
Dichlorotetrafluoroethane	**<2.0**	ug/m3	2.0	0.34	1.39		10/28/20 20:02	76-14-2	
Ethanol	**9.7**	ug/m3	2.7	0.79	1.39		10/28/20 20:02	64-17-5	
Ethyl acetate	**<1.0**	ug/m3	1.0	0.15	1.39		10/28/20 20:02	141-78-6	
Ethylbenzene	**0.62J**	ug/m3	1.2	0.20	1.39		10/28/20 20:02	100-41-4	
4-Ethyltoluene	**<3.5**	ug/m3	3.5	0.30	1.39		10/28/20 20:02	622-96-8	
n-Heptane	**0.53J**	ug/m3	1.2	0.21	1.39		10/28/20 20:02	142-82-5	
Hexachloro-1,3-butadiene	**<7.5**	ug/m3	7.5	2.7	1.39		10/28/20 20:02	87-68-3	
n-Hexane	**1.4**	ug/m3	1.0	0.30	1.39		10/28/20 20:02	110-54-3	
2-Hexanone	**<5.8**	ug/m3	5.8	0.99	1.39		10/28/20 20:02	591-78-6	
Methylene Chloride	**2.8J**	ug/m3	4.9	1.8	1.39		10/28/20 20:02	75-09-2	
4-Methyl-2-pentanone (MIBK)	**1.8J**	ug/m3	5.8	0.14	1.39		10/28/20 20:02	108-10-1	
Methyl-tert-butyl ether	**<5.1**	ug/m3	5.1	0.18	1.39		10/28/20 20:02	1634-04-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG37 **Lab ID: 10535875007** Collected: 10/16/20 10:57 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
	Pace Analytical Services - Minneapolis								
Naphthalene	**<3.7**	ug/m3	3.7	2.6	1.39		10/28/20 20:02	91-20-3	
2-Propanol	**2.4J**	ug/m3	3.5	1.2	1.39		10/28/20 20:02	67-63-0	
Propylene	**2.8**	ug/m3	0.49	0.33	1.39		10/28/20 20:02	115-07-1	
Styrene	**<1.2**	ug/m3	1.2	0.33	1.39		10/28/20 20:02	100-42-5	
1,1,2,2-Tetrachloroethane	**<0.97**	ug/m3	0.97	0.30	1.39		10/28/20 20:02	79-34-5	
Tetrachloroethene	**<0.96**	ug/m3	0.96	0.30	1.39		10/28/20 20:02	127-18-4	
Tetrahydrofuran	**5.8**	ug/m3	0.83	0.18	1.39		10/28/20 20:02	109-99-9	
Toluene	**3.5**	ug/m3	1.1	0.16	1.39		10/28/20 20:02	108-88-3	
1,2,4-Trichlorobenzene	**<10.5**	ug/m3	10.5	5.4	1.39		10/28/20 20:02	120-82-1	
1,1,1-Trichloroethane	**<1.5**	ug/m3	1.5	0.27	1.39		10/28/20 20:02	71-55-6	
1,1,2-Trichloroethane	**<0.77**	ug/m3	0.77	0.22	1.39		10/28/20 20:02	79-00-5	
Trichloroethene	**<0.76**	ug/m3	0.76	0.27	1.39		10/28/20 20:02	79-01-6	
Trichlorofluoromethane	**<1.6**	ug/m3	1.6	0.33	1.39		10/28/20 20:02	75-69-4	
1,1,2-Trichlorotrifluoroethane	**0.34J**	ug/m3	2.2	0.32	1.39		10/28/20 20:02	76-13-1	
1,2,4-Trimethylbenzene	**0.27J**	ug/m3	1.4	0.19	1.39		10/28/20 20:02	95-63-6	
1,3,5-Trimethylbenzene	**<1.4**	ug/m3	1.4	0.28	1.39		10/28/20 20:02	108-67-8	
Vinyl acetate	**<1.0**	ug/m3	1.0	0.15	1.39		10/28/20 20:02	108-05-4	
Vinyl chloride	**<0.36**	ug/m3	0.36	0.12	1.39		10/28/20 20:02	75-01-4	
m&p-Xylene	**1.9J**	ug/m3	2.5	0.53	1.39		10/28/20 20:02	179601-23-1	
o-Xylene	**0.50J**	ug/m3	1.2	0.20	1.39		10/28/20 20:02	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
	Pace Analytical Services - Minneapolis								
Methane	**<69.5**	ppmv	69.5	14.7	1.39		10/25/20 16:25	74-82-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG37 Cert#1487 **Lab ID: 10535875008** Collected: 10/16/20 10:57 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15								
	Pace Analytical Services - Minneapolis								
Acetone	**<3.0**	ug/m3	3.0	0.88	0.5		09/17/20 10:24	67-64-1	
Benzene	**<0.16**	ug/m3	0.16	0.064	0.5		09/17/20 10:24	71-43-2	
Benzyl chloride	**<1.3**	ug/m3	1.3	0.16	0.5		09/17/20 10:24	100-44-7	
Bromodichloromethane	**<0.68**	ug/m3	0.68	0.13	0.5		09/17/20 10:24	75-27-4	
Bromoform	**<2.6**	ug/m3	2.6	0.70	0.5		09/17/20 10:24	75-25-2	
Bromomethane	**<0.39**	ug/m3	0.39	0.090	0.5		09/17/20 10:24	74-83-9	
1,3-Butadiene	**<0.22**	ug/m3	0.22	0.050	0.5		09/17/20 10:24	106-99-0	
2-Butanone (MEK)	**<1.5**	ug/m3	1.5	0.27	0.5		09/17/20 10:24	78-93-3	
Carbon disulfide	**<0.32**	ug/m3	0.32	0.098	0.5		09/17/20 10:24	75-15-0	
Carbon tetrachloride	**<0.64**	ug/m3	0.64	0.074	0.5		09/17/20 10:24	56-23-5	
Chlorobenzene	**<0.47**	ug/m3	0.47	0.076	0.5		09/17/20 10:24	108-90-7	
Chloroethane	**<0.27**	ug/m3	0.27	0.066	0.5		09/17/20 10:24	75-00-3	
Chloroform	**<0.25**	ug/m3	0.25	0.096	0.5		09/17/20 10:24	67-66-3	
Chloromethane	**<0.21**	ug/m3	0.21	0.048	0.5		09/17/20 10:24	74-87-3	
Cyclohexane	**<0.88**	ug/m3	0.88	0.11	0.5		09/17/20 10:24	110-82-7	
Dibromochloromethane	**<0.86**	ug/m3	0.86	0.15	0.5		09/17/20 10:24	124-48-1	
1,2-Dibromoethane (EDB)	**<0.39**	ug/m3	0.39	0.16	0.5		09/17/20 10:24	106-93-4	
1,2-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.19	0.5		09/17/20 10:24	95-50-1	
1,3-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.24	0.5		09/17/20 10:24	541-73-1	
1,4-Dichlorobenzene	**<1.5**	ug/m3	1.5	0.42	0.5		09/17/20 10:24	106-46-7	
Dichlorodifluoromethane	**<0.50**	ug/m3	0.50	0.075	0.5		09/17/20 10:24	75-71-8	
1,1-Dichloroethane	**<0.41**	ug/m3	0.41	0.063	0.5		09/17/20 10:24	75-34-3	
1,2-Dichloroethane	**<0.21**	ug/m3	0.21	0.089	0.5		09/17/20 10:24	107-06-2	
1,1-Dichloroethene	**<0.40**	ug/m3	0.40	0.072	0.5		09/17/20 10:24	75-35-4	
cis-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.080	0.5		09/17/20 10:24	156-59-2	
trans-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.084	0.5		09/17/20 10:24	156-60-5	
1,2-Dichloropropane	**<0.47**	ug/m3	0.47	0.085	0.5		09/17/20 10:24	78-87-5	
cis-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.11	0.5		09/17/20 10:24	10061-01-5	
trans-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.14	0.5		09/17/20 10:24	10061-02-6	
Dichlorotetrafluoroethane	**<0.71**	ug/m3	0.71	0.16	0.5		09/17/20 10:24	76-14-2	
Ethanol	**<0.96**	ug/m3	0.96	0.47	0.5		09/17/20 10:24	64-17-5	
Ethyl acetate	**<0.37**	ug/m3	0.37	0.084	0.5		09/17/20 10:24	141-78-6	
Ethylbenzene	**<0.44**	ug/m3	0.44	0.090	0.5		09/17/20 10:24	100-41-4	
4-Ethyltoluene	**<1.2**	ug/m3	1.2	0.24	0.5		09/17/20 10:24	622-96-8	
n-Heptane	**<0.42**	ug/m3	0.42	0.086	0.5		09/17/20 10:24	142-82-5	
Hexachloro-1,3-butadiene	**<2.7**	ug/m3	2.7	0.40	0.5		09/17/20 10:24	87-68-3	
n-Hexane	**<0.36**	ug/m3	0.36	0.12	0.5		09/17/20 10:24	110-54-3	
2-Hexanone	**<2.1**	ug/m3	2.1	0.18	0.5		09/17/20 10:24	591-78-6	
Methylene Chloride	**<1.8**	ug/m3	1.8	0.49	0.5		09/17/20 10:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	**<2.1**	ug/m3	2.1	0.10	0.5		09/17/20 10:24	108-10-1	
Methyl-tert-butyl ether	**<1.8**	ug/m3	1.8	0.069	0.5		09/17/20 10:24	1634-04-4	
Naphthalene	**<1.3**	ug/m3	1.3	0.62	0.5		09/17/20 10:24	91-20-3	
2-Propanol	**<1.2**	ug/m3	1.2	0.43	0.5		09/17/20 10:24	67-63-0	
Propylene	**0.053J**	ug/m3	0.18	0.049	0.5		09/17/20 10:24	115-07-1	
Styrene	**<0.43**	ug/m3	0.43	0.18	0.5		09/17/20 10:24	100-42-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Sample: PSG37 Cert#1487 **Lab ID: 10535875008** Collected: 10/16/20 10:57 Received: 10/16/20 13:56 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
1,1,2,2-Tetrachloroethane	**<0.35**	ug/m3	0.35	0.15	0.5		09/17/20 10:24	79-34-5	
Tetrachloroethene	**<0.34**	ug/m3	0.34	0.14	0.5		09/17/20 10:24	127-18-4	
Tetrahydrofuran	**<0.30**	ug/m3	0.30	0.085	0.5		09/17/20 10:24	109-99-9	
Toluene	**<0.38**	ug/m3	0.38	0.083	0.5		09/17/20 10:24	108-88-3	
1,2,4-Trichlorobenzene	**<3.8**	ug/m3	3.8	1.7	0.5		09/17/20 10:24	120-82-1	
1,1,1-Trichloroethane	**<0.56**	ug/m3	0.56	0.067	0.5		09/17/20 10:24	71-55-6	
1,1,2-Trichloroethane	**<0.28**	ug/m3	0.28	0.11	0.5		09/17/20 10:24	79-00-5	
Trichloroethene	**<0.27**	ug/m3	0.27	0.088	0.5		09/17/20 10:24	79-01-6	
Trichlorofluoromethane	**<0.57**	ug/m3	0.57	0.14	0.5		09/17/20 10:24	75-69-4	
1,1,2-Trichlorotrifluoroethane	**<0.78**	ug/m3	0.78	0.12	0.5		09/17/20 10:24	76-13-1	
1,2,4-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.20	0.5		09/17/20 10:24	95-63-6	
1,3,5-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.15	0.5		09/17/20 10:24	108-67-8	
Vinyl acetate	**<0.36**	ug/m3	0.36	0.088	0.5		09/17/20 10:24	108-05-4	
Vinyl chloride	**<0.13**	ug/m3	0.13	0.050	0.5		09/17/20 10:24	75-01-4	
m&p-Xylene	**<0.88**	ug/m3	0.88	0.21	0.5		09/17/20 10:24	179601-23-1	
o-Xylene	**<0.44**	ug/m3	0.44	0.097	0.5		09/17/20 10:24	95-47-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

QC Batch: 706044 | Analysis Method: Method 3C Gases
QC Batch Method: Method 3C Gases | Analysis Description: METHOD 3C AIR - FIXED GASES
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535875001, 10535875003, 10535875005, 10535875007

METHOD BLANK: 3772020 Matrix: Air
Associated Lab Samples: 10535875001, 10535875003, 10535875005, 10535875007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Oxygen	%	<2.0	2.0	0.15	10/22/20 10:31	

LABORATORY CONTROL SAMPLE & LCSD: 3772021 3772022

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oxygen	%	10	9.8	9.5	98	95	70-130	3	30	

SAMPLE DUPLICATE: 3772798

Parameter	Units	60351263001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oxygen	%	20.3	20.1	1	30	

SAMPLE DUPLICATE: 3772799

Parameter	Units	10536241007 Result	Dup Result	RPD	Max RPD	Qualifiers
Oxygen	%	14.2	13.8	2	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

QC Batch: 707224
QC Batch Method: TO-15
Analysis Method: TO-15
Analysis Description: TO15 MSV AIR Low Level
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535875001, 10535875003, 10535875005, 10535875007

METHOD BLANK: 3778470 Matrix: Air
Associated Lab Samples: 10535875001, 10535875003, 10535875005, 10535875007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	<0.56	0.56	0.096	10/28/20 09:47	
1,1,2,2-Tetrachloroethane	ug/m3	<0.35	0.35	0.11	10/28/20 09:47	
1,1,2-Trichloroethane	ug/m3	<0.28	0.28	0.078	10/28/20 09:47	
1,1,2-Trichlorotrifluoroethane	ug/m3	<0.78	0.78	0.12	10/28/20 09:47	
1,1-Dichloroethane	ug/m3	<0.41	0.41	0.064	10/28/20 09:47	
1,1-Dichloroethene	ug/m3	<0.40	0.40	0.066	10/28/20 09:47	
1,2,4-Trichlorobenzene	ug/m3	<3.8	3.8	2.0	10/28/20 09:47	
1,2,4-Trimethylbenzene	ug/m3	<0.50	0.50	0.068	10/28/20 09:47	
1,2-Dibromoethane (EDB)	ug/m3	<0.39	0.39	0.11	10/28/20 09:47	
1,2-Dichlorobenzene	ug/m3	<0.61	0.61	0.36	10/28/20 09:47	
1,2-Dichloroethane	ug/m3	<0.21	0.21	0.066	10/28/20 09:47	
1,2-Dichloropropane	ug/m3	<0.47	0.47	0.084	10/28/20 09:47	
1,3,5-Trimethylbenzene	ug/m3	<0.50	0.50	0.10	10/28/20 09:47	
1,3-Butadiene	ug/m3	<0.22	0.22	0.058	10/28/20 09:47	
1,3-Dichlorobenzene	ug/m3	<0.61	0.61	0.42	10/28/20 09:47	
1,4-Dichlorobenzene	ug/m3	<1.5	1.5	0.48	10/28/20 09:47	
2-Butanone (MEK)	ug/m3	<1.5	1.5	0.44	10/28/20 09:47	
2-Hexanone	ug/m3	<2.1	2.1	0.36	10/28/20 09:47	
2-Propanol	ug/m3	<1.2	1.2	0.43	10/28/20 09:47	
4-Ethyltoluene	ug/m3	<1.2	1.2	0.11	10/28/20 09:47	
4-Methyl-2-pentanone (MIBK)	ug/m3	<2.1	2.1	0.051	10/28/20 09:47	
Acetone	ug/m3	<3.0	3.0	1.1	10/28/20 09:47	
Benzene	ug/m3	<0.16	0.16	0.049	10/28/20 09:47	
Benzyl chloride	ug/m3	<1.3	1.3	0.66	10/28/20 09:47	
Bromodichloromethane	ug/m3	<0.68	0.68	0.11	10/28/20 09:47	
Bromoform	ug/m3	<2.6	2.6	0.40	10/28/20 09:47	
Bromomethane	ug/m3	<0.39	0.39	0.094	10/28/20 09:47	
Carbon disulfide	ug/m3	<0.32	0.32	0.047	10/28/20 09:47	
Carbon tetrachloride	ug/m3	<0.64	0.64	0.11	10/28/20 09:47	
Chlorobenzene	ug/m3	<0.47	0.47	0.076	10/28/20 09:47	
Chloroethane	ug/m3	<0.27	0.27	0.072	10/28/20 09:47	
Chloroform	ug/m3	<0.25	0.25	0.075	10/28/20 09:47	
Chloromethane	ug/m3	<0.21	0.21	0.040	10/28/20 09:47	
cis-1,2-Dichloroethene	ug/m3	<0.40	0.40	0.070	10/28/20 09:47	
cis-1,3-Dichloropropene	ug/m3	<0.46	0.46	0.076	10/28/20 09:47	
Cyclohexane	ug/m3	<0.88	0.88	0.092	10/28/20 09:47	
Dibromochloromethane	ug/m3	<0.86	0.86	0.16	10/28/20 09:47	
Dichlorodifluoromethane	ug/m3	<0.50	0.50	0.27	10/28/20 09:47	
Dichlorotetrafluoroethane	ug/m3	<0.71	0.71	0.12	10/28/20 09:47	
Ethanol	ug/m3	<0.96	0.96	0.28	10/28/20 09:47	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

METHOD BLANK: 3778470 Matrix: Air
Associated Lab Samples: 10535875001, 10535875003, 10535875005, 10535875007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethyl acetate	ug/m3	<0.37	0.37	0.056	10/28/20 09:47	
Ethylbenzene	ug/m3	<0.44	0.44	0.074	10/28/20 09:47	
Hexachloro-1,3-butadiene	ug/m3	<2.7	2.7	0.97	10/28/20 09:47	
m&p-Xylene	ug/m3	<0.88	0.88	0.19	10/28/20 09:47	
Methyl-tert-butyl ether	ug/m3	<1.8	1.8	0.065	10/28/20 09:47	
Methylene Chloride	ug/m3	<1.8	1.8	0.63	10/28/20 09:47	
n-Heptane	ug/m3	<0.42	0.42	0.076	10/28/20 09:47	
n-Hexane	ug/m3	<0.36	0.36	0.11	10/28/20 09:47	
Naphthalene	ug/m3	<1.3	1.3	0.94	10/28/20 09:47	
o-Xylene	ug/m3	<0.44	0.44	0.071	10/28/20 09:47	
Propylene	ug/m3	<0.18	0.18	0.12	10/28/20 09:47	
Styrene	ug/m3	<0.43	0.43	0.12	10/28/20 09:47	
Tetrachloroethene	ug/m3	<0.34	0.34	0.11	10/28/20 09:47	
Tetrahydrofuran	ug/m3	<0.30	0.30	0.064	10/28/20 09:47	
Toluene	ug/m3	<0.38	0.38	0.056	10/28/20 09:47	
trans-1,2-Dichloroethene	ug/m3	<0.40	0.40	0.085	10/28/20 09:47	
trans-1,3-Dichloropropene	ug/m3	<0.46	0.46	0.087	10/28/20 09:47	
Trichloroethene	ug/m3	<0.27	0.27	0.096	10/28/20 09:47	
Trichlorofluoromethane	ug/m3	<0.57	0.57	0.12	10/28/20 09:47	
Vinyl acetate	ug/m3	<0.36	0.36	0.054	10/28/20 09:47	
Vinyl chloride	ug/m3	<0.13	0.13	0.043	10/28/20 09:47	

LABORATORY CONTROL SAMPLE: 3778471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	57	56.8	100	70-130	
1,1,2,2-Tetrachloroethane	ug/m3	71.9	72.6	101	70-132	
1,1,2-Trichloroethane	ug/m3	57.3	58.6	102	70-133	
1,1,2-Trichlorotrifluoroethane	ug/m3	80.3	87.2	109	70-130	
1,1-Dichloroethane	ug/m3	42.7	43.9	103	70-130	
1,1-Dichloroethene	ug/m3	41.4	42.5	102	69-137	
1,2,4-Trichlorobenzene	ug/m3	156	159	102	70-130	
1,2,4-Trimethylbenzene	ug/m3	51.5	53.7	104	70-137	
1,2-Dibromoethane (EDB)	ug/m3	80.3	84.2	105	70-138	
1,2-Dichlorobenzene	ug/m3	63.1	71.9	114	70-136	
1,2-Dichloroethane	ug/m3	42.4	44.2	104	70-130	
1,2-Dichloropropane	ug/m3	48.6	49.9	103	70-132	
1,3,5-Trimethylbenzene	ug/m3	51.6	52.7	102	70-136	
1,3-Butadiene	ug/m3	23.3	23.2	100	67-139	
1,3-Dichlorobenzene	ug/m3	63.4	62.0	98	70-138	
1,4-Dichlorobenzene	ug/m3	63.4	61.3	97	70-145	
2-Butanone (MEK)	ug/m3	31.4	30.8	98	61-130	
2-Hexanone	ug/m3	42.8	41.5	97	70-138	
2-Propanol	ug/m3	119	114	96	70-136	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

LABORATORY CONTROL SAMPLE: 3778471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4-Ethyltoluene	ug/m3	52.4	55.9	107	70-142	
4-Methyl-2-pentanone (MIBK)	ug/m3	43.6	39.8	91	70-134	
Acetone	ug/m3	126	114	90	59-137	
Benzene	ug/m3	33.5	33.3	99	70-133	
Benzyl chloride	ug/m3	55.1	47.5	86	70-139	
Bromodichloromethane	ug/m3	71.5	73.4	103	70-130	
Bromoform	ug/m3	110	114	104	60-140	
Bromomethane	ug/m3	41.3	42.4	103	70-131	
Carbon disulfide	ug/m3	33.3	33.6	101	70-130	
Carbon tetrachloride	ug/m3	66.2	66.5	101	70-133	
Chlorobenzene	ug/m3	48.3	49.5	103	70-131	
Chloroethane	ug/m3	28.1	29.7	106	70-141	
Chloroform	ug/m3	51.1	51.9	102	70-130	
Chloromethane	ug/m3	21.9	21.7	99	64-137	
cis-1,2-Dichloroethene	ug/m3	41.6	43.1	104	70-132	
cis-1,3-Dichloropropene	ug/m3	47.7	48.9	103	70-138	
Cyclohexane	ug/m3	36.7	35.8	98	70-133	
Dibromochloromethane	ug/m3	90.7	93.3	103	70-139	
Dichlorodifluoromethane	ug/m3	51.6	50.1	97	70-130	
Dichlorotetrafluoroethane	ug/m3	72.7	73.3	101	65-133	
Ethanol	ug/m3	103	101	98	65-135	
Ethyl acetate	ug/m3	38.6	34.9	90	70-135	
Ethylbenzene	ug/m3	45.6	46.7	102	70-142	
Hexachloro-1,3-butadiene	ug/m3	112	108	97	70-134	
m&p-Xylene	ug/m3	91.2	93.3	102	70-141	
Methyl-tert-butyl ether	ug/m3	38.4	38.1	99	70-131	
Methylene Chloride	ug/m3	182	193	106	69-130	
n-Heptane	ug/m3	43.6	41.2	94	70-130	
n-Hexane	ug/m3	37.6	36.4	97	70-131	
Naphthalene	ug/m3	57.7	59.3	103	63-130	
o-Xylene	ug/m3	45.5	45.8	101	70-135	
Propylene	ug/m3	18.2	14.9	82	63-139	
Styrene	ug/m3	44.9	47.7	106	70-143	
Tetrachloroethene	ug/m3	71	73.6	104	70-136	
Tetrahydrofuran	ug/m3	31.5	31.3	99	70-137	
Toluene	ug/m3	39.5	38.5	97	70-136	
trans-1,2-Dichloroethene	ug/m3	42.2	43.6	103	70-132	
trans-1,3-Dichloropropene	ug/m3	47.7	48.9	103	70-139	
Trichloroethene	ug/m3	56.3	58.4	104	70-132	
Trichlorofluoromethane	ug/m3	59.7	61.1	102	65-136	
Vinyl acetate	ug/m3	34.5	30.5	88	66-140	
Vinyl chloride	ug/m3	26.7	26.7	100	68-141	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

SAMPLE DUPLICATE: 3780104

Parameter	Units	10535875001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	<1.6	<1.6		25	
1,1,2,2-Tetrachloroethane	ug/m3	<1.0	<1.0		25	
1,1,2-Trichloroethane	ug/m3	<0.80	<0.80		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	0.44J	0.52J		25	
1,1-Dichloroethane	ug/m3	<1.2	<1.2		25	
1,1-Dichloroethene	ug/m3	<1.2	<1.2		25	
1,2,4-Trichlorobenzene	ug/m3	<10.9	<10.9		25	
1,2,4-Trimethylbenzene	ug/m3	1.0J	1.1J		25	
1,2-Dibromoethane (EDB)	ug/m3	<1.1	<1.1		25	
1,2-Dichlorobenzene	ug/m3	<1.8	<1.8		25	
1,2-Dichloroethane	ug/m3	<0.59	<0.59		25	
1,2-Dichloropropane	ug/m3	<1.4	<1.4		25	
1,3,5-Trimethylbenzene	ug/m3	0.43J	0.47J		25	
1,3-Butadiene	ug/m3	<0.65	<0.65		25	
1,3-Dichlorobenzene	ug/m3	<1.8	<1.8		25	
1,4-Dichlorobenzene	ug/m3	<4.4	<4.4		25	
2-Butanone (MEK)	ug/m3	<4.3	1.5J		25	
2-Hexanone	ug/m3	<6.0	<6.0		25	
2-Propanol	ug/m3	<3.6	<3.6		25	
4-Ethyltoluene	ug/m3	<3.6	<3.6		25	
4-Methyl-2-pentanone (MIBK)	ug/m3	3.7J	3.9J		25	
Acetone	ug/m3	16.6	17.4	5	25	
Benzene	ug/m3	0.53	0.54	1	25	
Benzyl chloride	ug/m3	<3.8	<3.8		25	
Bromodichloromethane	ug/m3	<2.0	<2.0		25	
Bromoform	ug/m3	<7.6	<7.6		25	
Bromomethane	ug/m3	<1.1	<1.1		25	
Carbon disulfide	ug/m3	1.6	1.6	1	25	
Carbon tetrachloride	ug/m3	<1.8	<1.8		25	
Chlorobenzene	ug/m3	<1.3	<1.3		25	
Chloroethane	ug/m3	<0.77	<0.77		25	
Chloroform	ug/m3	<0.71	<0.71		25	
Chloromethane	ug/m3	<0.60	<0.60		25	
cis-1,2-Dichloroethene	ug/m3	<1.2	<1.2		25	
cis-1,3-Dichloropropene	ug/m3	<1.3	<1.3		25	
Cyclohexane	ug/m3	1.8J	1.8J		25	
Dibromochloromethane	ug/m3	<2.5	<2.5		25	
Dichlorodifluoromethane	ug/m3	2.4	2.4	1	25	
Dichlorotetrafluoroethane	ug/m3	<2.0	<2.0		25	
Ethanol	ug/m3	7.6	8.0	5	25	
Ethyl acetate	ug/m3	<1.1	<1.1		25	
Ethylbenzene	ug/m3	1.1J	1.2J		25	
Hexachloro-1,3-butadiene	ug/m3	<7.8	<7.8		25	
m&p-Xylene	ug/m3	3.0	3.0	2	25	
Methyl-tert-butyl ether	ug/m3	<5.3	<5.3		25	
Methylene Chloride	ug/m3	4.3J	4.3J		25	
n-Heptane	ug/m3	<1.2	1.5		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

SAMPLE DUPLICATE: 3780104

Parameter	Units	10535875001 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Hexane	ug/m3	2.8	2.9	3	25	
Naphthalene	ug/m3	<3.8	<3.8		25	
o-Xylene	ug/m3	0.79J	0.81J		25	
Propylene	ug/m3	3.3	3.5	5	25	
Styrene	ug/m3	<1.2	<1.2		25	
Tetrachloroethene	ug/m3	<0.99	<0.99		25	
Tetrahydrofuran	ug/m3	3.8	3.9	2	25	
Toluene	ug/m3	4.3	4.5	3	25	
trans-1,2-Dichloroethene	ug/m3	<1.2	<1.2		25	
trans-1,3-Dichloropropene	ug/m3	<1.3	<1.3		25	
Trichloroethene	ug/m3	<0.79	<0.79		25	
Trichlorofluoromethane	ug/m3	<1.6	<1.6		25	
Vinyl acetate	ug/m3	<1.0	<1.0		25	
Vinyl chloride	ug/m3	<0.37	<0.37		25	

SAMPLE DUPLICATE: 3780105

Parameter	Units	10535875003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	<1.5	<1.5		25	
1,1,2,2-Tetrachloroethane	ug/m3	<0.97	<0.97		25	
1,1,2-Trichloroethane	ug/m3	<0.77	<0.77		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	0.54J	0.44J		25	
1,1-Dichloroethane	ug/m3	<1.1	<1.1		25	
1,1-Dichloroethene	ug/m3	<1.1	<1.1		25	
1,2,4-Trichlorobenzene	ug/m3	<10.5	<10.5		25	
1,2,4-Trimethylbenzene	ug/m3	0.30J	0.31J		25	
1,2-Dibromoethane (EDB)	ug/m3	<1.1	<1.1		25	
1,2-Dichlorobenzene	ug/m3	<1.7	<1.7		25	
1,2-Dichloroethane	ug/m3	<0.57	<0.57		25	
1,2-Dichloropropane	ug/m3	<1.3	<1.3		25	
1,3,5-Trimethylbenzene	ug/m3	<1.4	<1.4		25	
1,3-Butadiene	ug/m3	<0.63	<0.63		25	
1,3-Dichlorobenzene	ug/m3	<1.7	<1.7		25	
1,4-Dichlorobenzene	ug/m3	<4.3	<4.3		25	
2-Butanone (MEK)	ug/m3	<4.2	<4.2		25	
2-Hexanone	ug/m3	<5.8	<5.8		25	
2-Propanol	ug/m3	<3.5	<3.5		25	
4-Ethyltoluene	ug/m3	<3.5	<3.5		25	
4-Methyl-2-pentanone (MIBK)	ug/m3	1.4J	1.4J		25	
Acetone	ug/m3	11.3	11.2	1	25	
Benzene	ug/m3	0.49	0.49	1	25	
Benzyl chloride	ug/m3	<3.7	<3.7		25	
Bromodichloromethane	ug/m3	<1.9	<1.9		25	
Bromoform	ug/m3	<7.3	<7.3		25	
Bromomethane	ug/m3	<1.1	<1.1		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

SAMPLE DUPLICATE: 3780105

Parameter	Units	10535875003 Result	Dup Result	RPD	Max RPD	Qualifiers
Carbon disulfide	ug/m3	<0.88	<0.88		25	
Carbon tetrachloride	ug/m3	<1.8	<1.8		25	
Chlorobenzene	ug/m3	<1.3	<1.3		25	
Chloroethane	ug/m3	<0.75	<0.75		25	
Chloroform	ug/m3	<0.69	<0.69		25	
Chloromethane	ug/m3	0.57J	0.60		25	
cis-1,2-Dichloroethene	ug/m3	<1.1	<1.1		25	
cis-1,3-Dichloropropene	ug/m3	<1.3	<1.3		25	
Cyclohexane	ug/m3	0.59J	0.60J		25	
Dibromochloromethane	ug/m3	<2.4	<2.4		25	
Dichlorodifluoromethane	ug/m3	2.7	2.7	1	25	
Dichlorotetrafluoroethane	ug/m3	<2.0	<2.0		25	
Ethanol	ug/m3	13.1	13.3	2	25	
Ethyl acetate	ug/m3	<1.0	<1.0		25	
Ethylbenzene	ug/m3	0.50J	0.53J		25	
Hexachloro-1,3-butadiene	ug/m3	<7.5	<7.5		25	
m&p-Xylene	ug/m3	1.7J	1.7J		25	
Methyl-tert-butyl ether	ug/m3	<5.1	<5.1		25	
Methylene Chloride	ug/m3	2.4J	2.4J		25	
n-Heptane	ug/m3	<1.2	0.47J		25	
n-Hexane	ug/m3	1.3	1.2	5	25	
Naphthalene	ug/m3	<3.7	<3.7		25	
o-Xylene	ug/m3	0.45J	0.46J		25	
Propylene	ug/m3	<0.49	<0.49		25	
Styrene	ug/m3	<1.2	<1.2		25	
Tetrachloroethene	ug/m3	<0.96	<0.96		25	
Tetrahydrofuran	ug/m3	6.6	6.6	1	25	
Toluene	ug/m3	3.0	3.0	0	25	
trans-1,2-Dichloroethene	ug/m3	<1.1	<1.1		25	
trans-1,3-Dichloropropene	ug/m3	<1.3	<1.3		25	
Trichloroethene	ug/m3	<0.76	<0.76		25	
Trichlorofluoromethane	ug/m3	1.3J	1.3J		25	
Vinyl acetate	ug/m3	<1.0	<1.0		25	
Vinyl chloride	ug/m3	<0.36	<0.36		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

QC Batch: 706594
QC Batch Method: TO-3 Air
Analysis Method: TO-3 Air
Analysis Description: TO3 GCV AIR METH,ETHANE,ETHENE
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535875001, 10535875003, 10535875005, 10535875007

METHOD BLANK: 3775322 Matrix: Air
Associated Lab Samples: 10535875001, 10535875003, 10535875005, 10535875007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ppmv	<50.0	50.0	10.6	10/25/20 14:53	

LABORATORY CONTROL SAMPLE & LCSD: 3775323 3775324

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ppmv	1000	1120	950	112	95	70-130	17	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

SAMPLE QUALIFIERS

Sample: 10535875001
[1] Analysis performed at 1800 Elm Street.
[2] The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

Sample: 10535875003
[1] Analysis performed at 1800 Elm Street.
[2] The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

Sample: 10535875005
[1] Analysis performed at 1800 Elm Street.
[2] The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

Sample: 10535875007
[1] Analysis performed at 1800 Elm Street.
[2] The Total Hydrocarbon (THC) pattern occured in the first half of the chromatogram (before toluene).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535875

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10535875001	**PSG33**	Method 3C Gases	706044		
10535875003	**PSG35**	Method 3C Gases	706044		
10535875005	**PSG36**	Method 3C Gases	706044		
10535875007	**PSG37**	Method 3C Gases	706044		
10535875001	**PSG33**	TO-15	707224		
10535875003	**PSG35**	TO-15	707224		
10535875005	**PSG36**	TO-15	707224		
10535875007	**PSG37**	TO-15	707224		
10535875002	**PSG33 Cert#1731**	TO-15	705080		
10535875004	**PSG35 Cert#3675**	TO-15	705080		
10535875006	**PSG36 Cert#1585**	TO-15	705080		
10535875008	**PSG37 Cert#1487**	TO-15	705080		
10535875001	**PSG33**	TO-3 Air	706594		
10535875003	**PSG35**	TO-3 Air	706594		
10535875005	**PSG36**	TO-3 Air	706594		
10535875007	**PSG37**	TO-3 Air	706594		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:

Company:	Bay West
Address:	5 Empire Dr. St.Paul MN, 55103
Project Manager :	Erik Nimlos
Email To:	enimlos@baywest.com
Phone:	651-291-3493
Copy To:	Eweaver@baywest.com

Section B — Required Project Information:

Project Name:	SW#27 Vadnais Heights Demo Landfi
Project Number:	200402
Turnaround Time:	Standard
Site Location (State):	MN
Copy To:	ryanR@baywest.com
Copy To:	

Section C — Invoice Information:

Attention:	Accounts Payable
Company Name:	Bay West LLC
Address:	5 Empire Dr. St. Paul, MN 55103
Purchase Order No.	205946

Section D — Laboratory Information

Lab Name:	Pace
Adress:	) Elm St. Minneapolis MN, 5
Lab Project Manager	Colin Lynch
Lab Phone:	612-656-2286

Section E — MPCA Information

COC ID:	
Work Order Numbe	3000027125
Facility Code:	SW0000136
Project Task Code:	PRJ07786
Program Code	

WO# : 10535875

10535875

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Gas-Soil= Soil Gas	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	Air-Ambnt= Ambient Air	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	Air-Indoor= Indoor Air	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe		QC-FB=Field Blank Sample
WG=Groundwater	AR=Air		QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material		QC-TB=Trip Blank Sample
	OT=Other		

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	Date Start	Date End	Time Start	Time End	Start Pressure	End Pressure	Sample Type (G=GRAB C=COMP)	Lab Matrix Code	Field Matrix Code	Can #	Reg. #	# of Containers	Preservatives	Requested Analysis: TO-15	TO-3M (Methane)	TO-3C (Oxygen)	Comments
1	2001007194	PSG33	Sample	10/14/20	10/16/20	0950	1031	-29	-3	G	AR	Gas-Soil	1731	2691	1		x	x	x	COL COL
2	~~2001007195~~	~~PSG34~~	~~Sample~~	~~10/16/20~~	~~10/16/20~~					~~G~~	~~AR~~	~~Gas-Soil~~	~~1487~~	~~1628~~	~~1~~		x	x	x	OMIT PB
3	2001007196	PSG35	Sample	10/16/20	10/16/20	1112	1155	-28	-3	G	AR	Gas-Soil			1		x	x	x	COL COL
4	2001007197	PSG36	Sample	10/16/20	10/16/20	1107	1148	-30	-3	G	AR	Gas-Soil	1585	1506	1		x	x	x	COL COL
5	2001007198	PSG37	Sample	10/16/20	10/16/20	1014	1057	-30	-3	G	AR	Gas-Soil	1487	1628	1		x	x	x	COL COL
6																				
7																				
8																				
9																				
10																				
11																				
12																				

TO-15

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Kayla Bouwkeester/BW	10/16/20	13:56	[signature]	10-16-20	1356	—

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Y N	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kayla Bouwkeester

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/16/20

Pace Analytical®	Document Name: Sample Condition Upon Receipt (SCUR) - Air	Document Revised: 24Mar2020 Page 1 of 1
	Document No.: ENV-FRM-MIN4-0113 Rev.00	Pace Analytical Services - Minneapolis

Air Sample Condition Upon Receipt

Client Name: BAYWEST

Project #: WO#: 10535875

PM: CL1 Due Date: 10/30/20

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☒Client ☐Pace ☐SpeeDee ☐Commercial **See Exception** ☐

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No

Packing Material: ☐Bubble Wrap ☐Bubble Bags ☐Foam ☒None ☐Tin Can ☐Other:_____ **Temp Blank rec:** ☐Yes ☒No

Temp. (TO17 and TO13 samples only) (°C): X **Corrected Temp (°C):** X **Thermometer Used:** ☐G87A9170600254 ☐G87A9155100842

Temp should be above freezing to 6°C **Correction Factor:** X **Date & Initials of Person Examining Contents:** 10.16.20 CMY

Type of ice Received ☐Blue ☐Wet ☒None

		Comments:
Chain of Custody Present?	☒Yes ☐No	1.
Chain of Custody Filled Out?	☒Yes ☐No	2.
Chain of Custody Relinquished?	☒Yes ☐No	3.
Sampler Name and/or Signature on COC?	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time?	☒Yes ☐No	5.
Short Hold Time Analysis (<72 hr)?	☐Yes ☒No	6.
Rush Turn Around Time Requested?	☐Yes ☒No	7.
Sufficient Volume?	☒Yes ☐No	8.
Correct Containers Used? **(Tedlar bags not acceptable container for TO-14, TO-15 or APH)** -Pace Containers Used?	☒Yes ☐No ☒Yes ☐No	9.
Containers Intact? **(visual inspection/no leaks when pressurized)**	☒Yes ☐No	10.
Media: (Air Can) Airbag Filter TDT Passive		11. Individually Certified Cans (Y) N (list which samples)
Is sufficient information available to reconcile samples to the COC?	☒Yes ☐No	12.
Do cans need to be pressurized? **(DO NOT PRESSURIZE 3C or ASTM 1946!!!)**	☐Yes ☒No	13.

Gauge # ☐10AIR26 ☐10AIR34 ☐10AIR35 ☐4097

Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
33	1731	2699	-2						
35	3675	2745	-1						
36	1583	1506	-2						
37	1487	1628	-1						
UNUSED	3660	1902	-29						

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 10/20/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30213.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TO15 Analysis (UNIX)

Data file : \\192.168.10.12\chem\10airB.i\102820.b\30213.D
Lab Smp Id: 10535875001
Inj Date : 28-OCT-2020 17:34
Operator : AFV Inst ID: 10airB.i
Smp Info :
Misc Info : 37946
Comment : Volatile Organic COMPOUNDS in Air
Method : \\192.168.10.12\chem\10airB.i\102820.b\TO15_301-20.m
Meth Date : 29-Oct-2020 10:42 avandenbro Quant Type: ISTD
Cal Date : 27-OCT-2020 20:28 Cal File: 30110.D
Als bottle: 13
Dil Factor: 1.44000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: RC10A
Processing Host: 10MNAIRWKS11

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30213.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

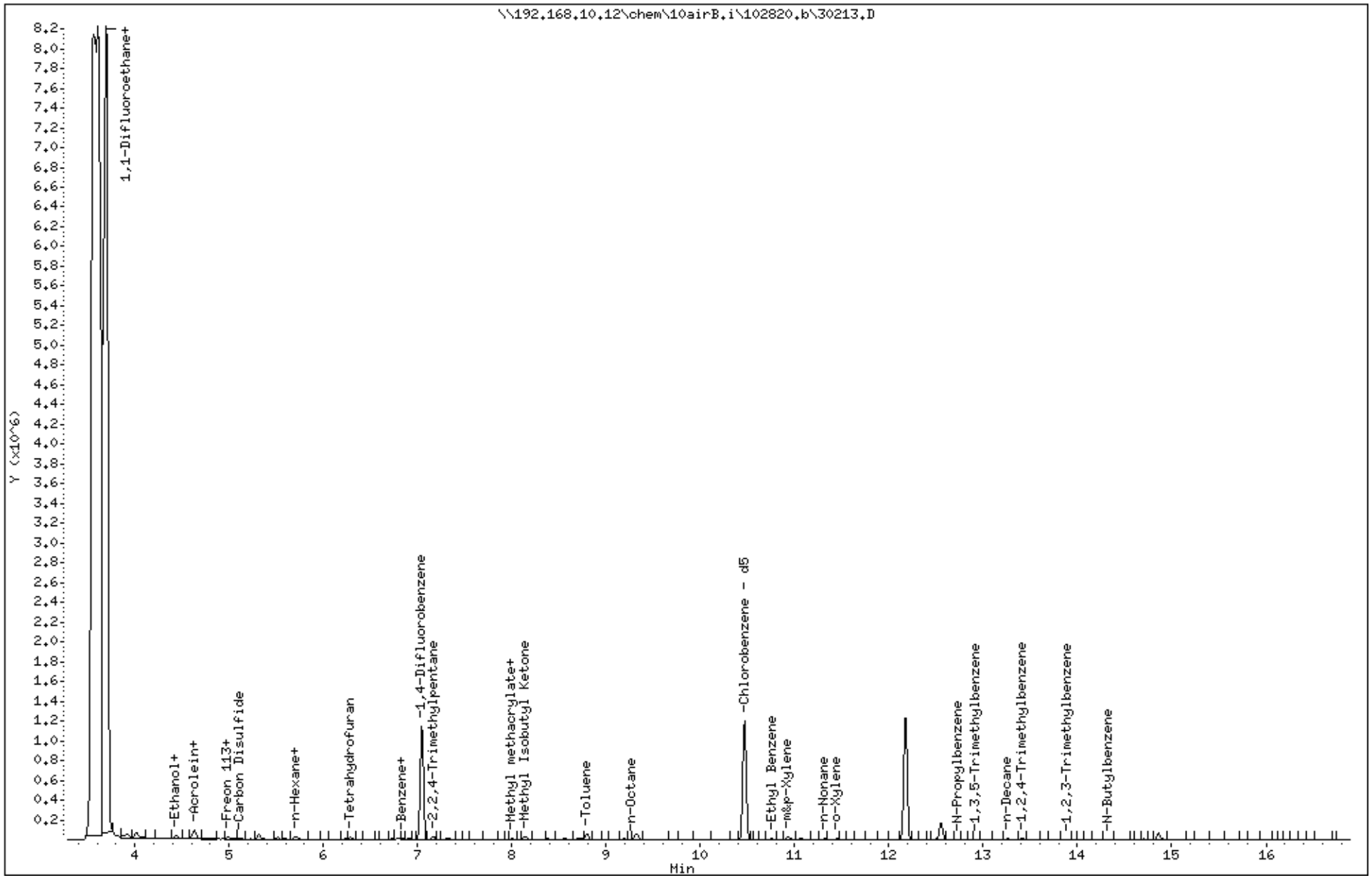
Client Name: Client SDG: 102820.b
Lab Smp Id: 10535875001
Operator : AFV Sample Date:
Sample Location: Sample Point:
Sample Matrix: AIR Date Received:
Analysis Type: VOA Level: LOW
Inj Date: 28-OCT-2020 17:34

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ppbv

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30213.D
Date : 28-OCT-2020 17:34
Client ID:
Sample Info:

Instrument: 10airB.i
Operator: AFV
Column phase: ZB-5MSplus SN338857
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10airB.i\102820.b\30215.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TO15 Analysis (UNIX)

Data file : \\192.168.10.12\chem\10airB.i\102820.b\30215.D
Lab Smp Id: 10535875003
Inj Date : 28-OCT-2020 18:33
Operator : AFV Inst ID: 10airB.i
Smp Info :
Misc Info : 37946
Comment : Volatile Organic COMPOUNDS in Air
Method : \\192.168.10.12\chem\10airB.i\102820.b\TO15_301-20.m
Meth Date : 29-Oct-2020 10:42 avandenbro Quant Type: ISTD
Cal Date : 27-OCT-2020 20:28 Cal File: 30110.D
Als bottle: 15
Dil Factor: 1.39000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: RC10A
Processing Host: 10MNAIRWKS11

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30215.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

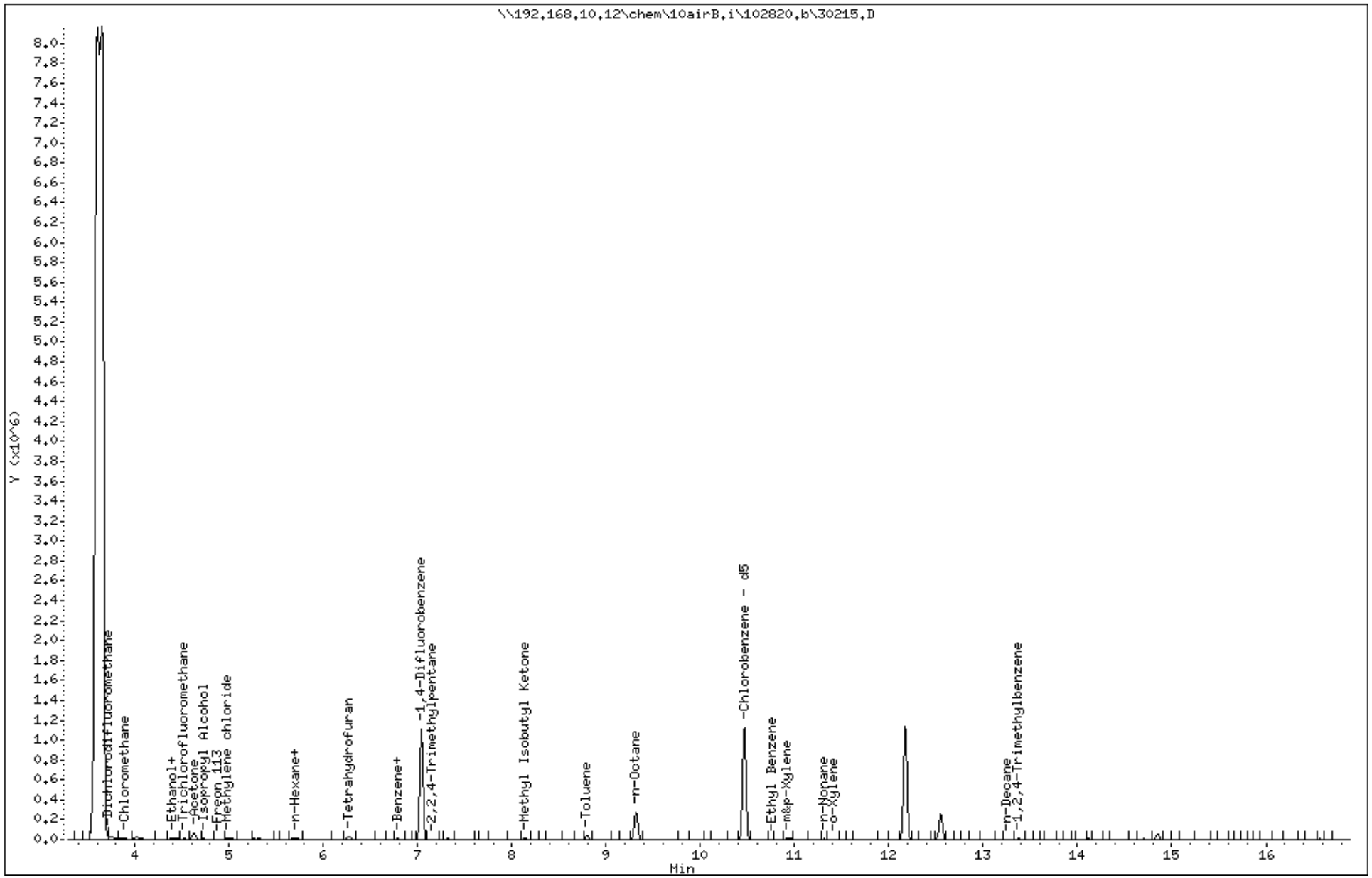
Client Name: Client SDG: 102820.b
Lab Smp Id: 10535875003
Operator : AFV Sample Date:
Sample Location: Sample Point:
Sample Matrix: AIR Date Received:
Analysis Type: VOA Level: LOW
Inj Date: 28-OCT-2020 18:33

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ppbv

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30215.D
Date : 28-OCT-2020 18:33
Client ID:
Sample Info:

Instrument: 10airB.i
Operator: AFV
Column phase: ZB-5MSplus SN338857
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10airB.i\102820.b\30217.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TO15 Analysis (UNIX)

Data file : \\192.168.10.12\chem\10airB.i\102820.b\30217.D
Lab Smp Id: 10535875005
Inj Date : 28-OCT-2020 19:33
Operator : AFV Inst ID: 10airB.i
Smp Info :
Misc Info : 37946
Comment : Volatile Organic COMPOUNDS in Air
Method : \\192.168.10.12\chem\10airB.i\102820.b\TO15_301-20.m
Meth Date : 29-Oct-2020 10:42 avandenbro Quant Type: ISTD
Cal Date : 27-OCT-2020 20:28 Cal File: 30110.D
Als bottle: 17
Dil Factor: 1.44000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: RC10A
Processing Host: 10MNAIRWKS11

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30217.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

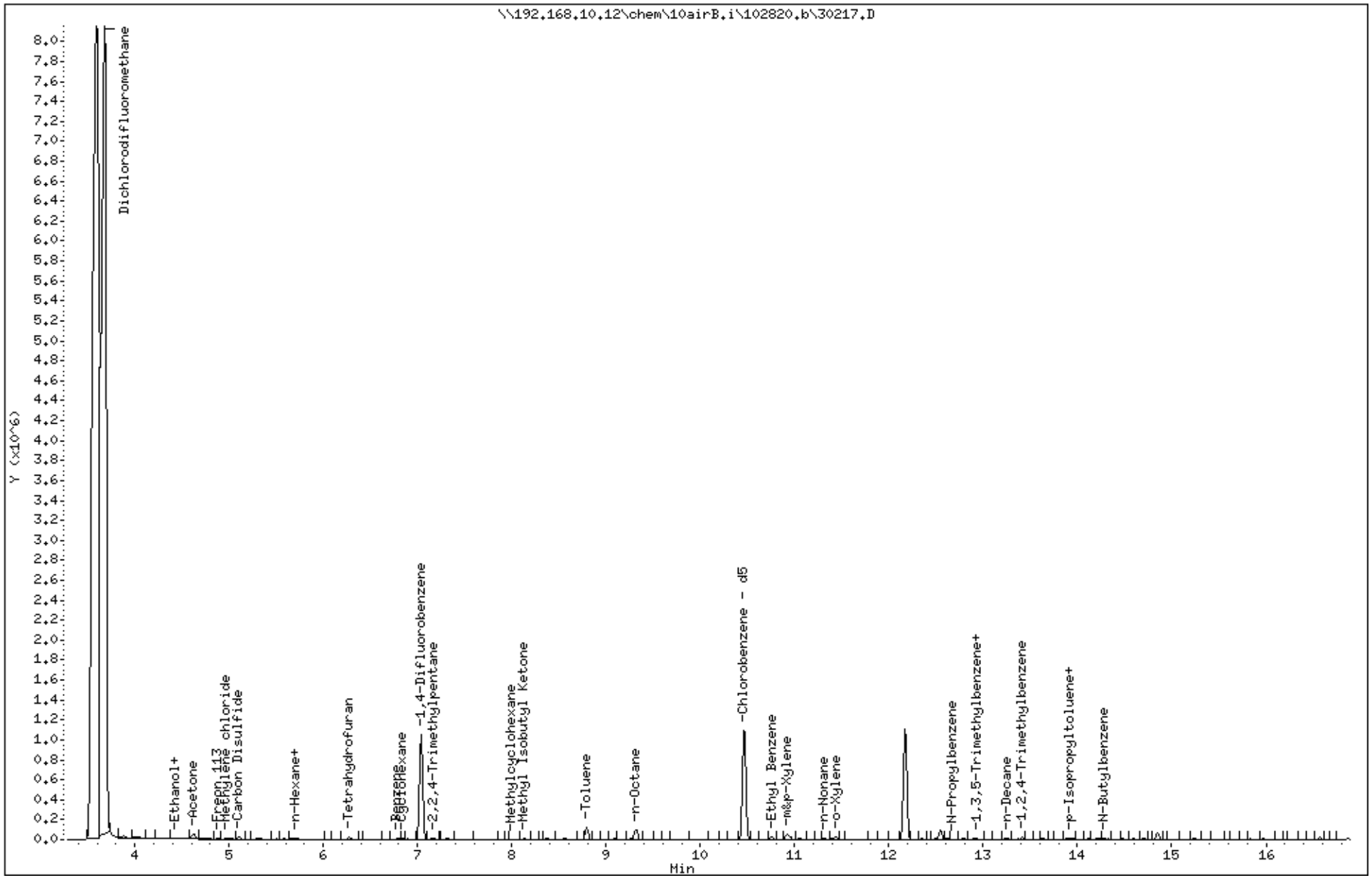
Client Name: Client SDG: 102820.b
Lab Smp Id: 10535875005
Operator : AFV Sample Date:
Sample Location: Sample Point:
Sample Matrix: AIR Date Received:
Analysis Type: VOA Level: LOW
Inj Date: 28-OCT-2020 19:33

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ppbv

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30217.D
Date : 28-OCT-2020 19:33
Client ID:
Sample Info:

Instrument: 10airB.i
Operator: AFV
Column phase: ZB-5MSplus SN338857
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10airB.i\102820.b\30218.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TO15 Analysis (UNIX)

Data file : \\192.168.10.12\chem\10airB.i\102820.b\30218.D
Lab Smp Id: 10535875007
Inj Date : 28-OCT-2020 20:02
Operator : AFV Inst ID: 10airB.i
Smp Info :
Misc Info : 37946
Comment : Volatile Organic COMPOUNDS in Air
Method : \\192.168.10.12\chem\10airB.i\102820.b\TO15_301-20.m
Meth Date : 29-Oct-2020 10:42 avandenbro Quant Type: ISTD
Cal Date : 27-OCT-2020 20:28 Cal File: 30110.D
Als bottle: 18
Dil Factor: 1.39000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: RC10A

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30218.D
Report Date: 29-Oct-2020 13:35

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: Client SDG: 102820.b
Lab Smp Id: 10535875007
Operator : AFV Sample Date:
Sample Location: Sample Point:
Sample Matrix: AIR Date Received:
Analysis Type: VOA Level: LOW
Inj Date: 28-OCT-2020 20:02

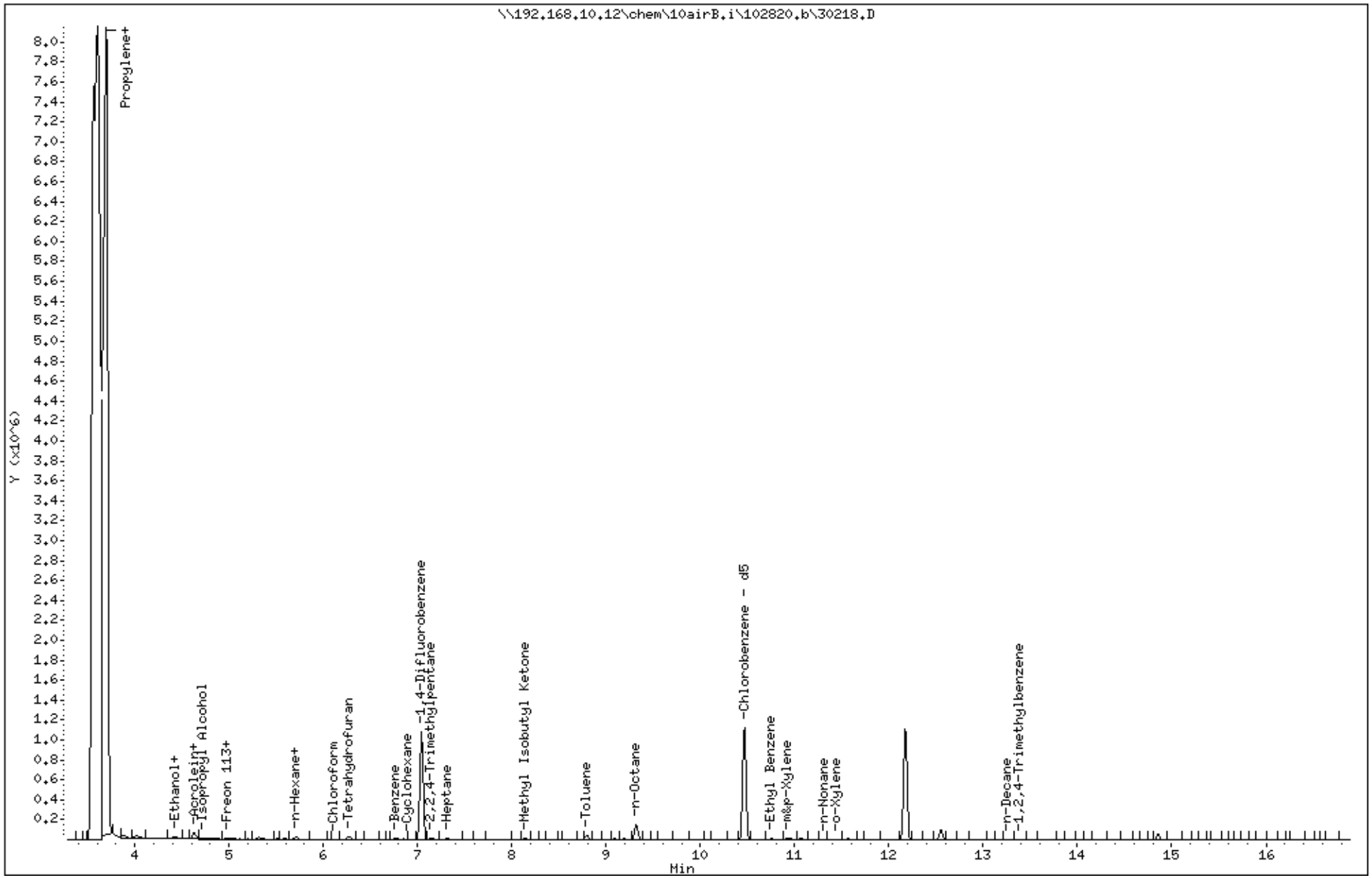
Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/KG) ppbv

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Data File: \\192.168.10.12\chem\10airB.i\102820.b\30218.D
Date : 28-OCT-2020 20:02
Client ID:
Sample Info:

Instrument: 10airB.i
Operator: AFV
Column phase: ZB-5MSplus SN338857
Column diameter: 0.32



Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

October 28, 2020

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Lynch
colin.lynch@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Pace Analytical Services - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Massachusetts DWP Certification #: via MN 027-053-137
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10535889001	**IDW01 TCLP**	Solid	10/16/20 13:00	10/16/20 13:55

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10535889001	**IDW01 TCLP**	EPA 8081B	RAG	9
		EPA 6010D	IP	7
		EPA 7470A	LMW	1
		EPA 8270E	MS4	18
		EPA 8260D	MM3	14

PASI-M = Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8081B**
Description: 8081B GCS Pesticides, TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 8081B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA Mod. 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 705526

S0: Surrogate recovery outside laboratory control limits.

- MS (Lab ID: 3769279)
  - Tetrachloro-m-xylene (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 705526

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10535889001

R1: RPD value was outside control limits.

- MSD (Lab ID: 3769280)
  - Heptachlor

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8081B**
Description: 8081B GCS Pesticides, TCLP
Client: Bay West LLC
Date: October 28, 2020

Analyte Comments:

QC Batch: 705526

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- IDW01 TCLP (Lab ID: 10535889001)
  - Tetrachloro-m-xylene (S)
- MS (Lab ID: 3769279)
  - Tetrachloro-m-xylene (S)
- MSD (Lab ID: 3769280)
  - Tetrachloro-m-xylene (S)

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 6010D**
Description: 6010D MET ICP, TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 6010D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010A with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 705501

B: Analyte was detected in the associated method blank.

- LB for HBN 705145 [TCLP/10302] (Lab ID: 3767812)
  - Chromium

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 7470A**
Description: 7470A Mercury, TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 7470A by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8270E**
Description: 8270E MSSV TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 8270E by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 705494

S0: Surrogate recovery outside laboratory control limits.

- LCS (Lab ID: 3769114)
  - 2-Fluorophenol (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 705494

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10535367001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 3769115)
  - Pyridine

Additional Comments:

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Method: **EPA 8260D**
Description: 8260D MSV TCLP
Client: Bay West LLC
Date: October 28, 2020

General Information:
1 sample was analyzed for EPA 8260D by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Sample: IDW01 TCLP **Lab ID: 10535889001** Collected: 10/16/20 13:00 Received: 10/16/20 13:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides, TCLP	Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C Leachate Method/Date: EPA 1311; 10/20/20 09:22 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
gamma-BHC (Lindane)	**<2.5**	ug/L	2.5	0.033	5	10/20/20 14:18	10/23/20 04:52	58-89-9	
Chlordane (Technical)	**<25.0**	ug/L	25.0	1.1	5	10/20/20 14:18	10/23/20 04:52	57-74-9	
Endrin	**<5.0**	ug/L	5.0	0.10	5	10/20/20 14:18	10/23/20 04:52	72-20-8	
Heptachlor	**<2.5**	ug/L	2.5	0.047	5	10/20/20 14:18	10/23/20 04:52	76-44-8	R1
Heptachlor epoxide	**<2.5**	ug/L	2.5	0.037	5	10/20/20 14:18	10/23/20 04:52	1024-57-3	
Methoxychlor	**<25.0**	ug/L	25.0	0.86	5	10/20/20 14:18	10/23/20 04:52	72-43-5	
Toxaphene	**<75.0**	ug/L	75.0	2.3	5	10/20/20 14:18	10/23/20 04:52	8001-35-2	
Surrogates									
Tetrachloro-m-xylene (S)	86	%.	74-125		5	10/20/20 14:18	10/23/20 04:52	877-09-8	D3
Decachlorobiphenyl (S)	97	%.	58-136		5	10/20/20 14:18	10/23/20 04:52	2051-24-3	
6010D MET ICP, TCLP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Leachate Method/Date: EPA 1311; 10/19/20 13:32 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
Arsenic	**<0.50**	mg/L	0.50	0.019	1	10/20/20 11:46	10/21/20 09:53	7440-38-2	
Barium	**0.91J**	mg/L	1.0	0.0033	1	10/20/20 11:46	10/21/20 09:53	7440-39-3	
Cadmium	**<0.050**	mg/L	0.050	0.0016	1	10/20/20 11:46	10/21/20 09:53	7440-43-9	
Chromium	**0.0036J**	mg/L	0.50	0.0033	1	10/20/20 11:46	10/21/20 09:53	7440-47-3	B
Lead	**0.015J**	mg/L	0.50	0.0098	1	10/20/20 11:46	10/21/20 09:53	7439-92-1	
Selenium	**<0.10**	mg/L	0.10	0.029	1	10/20/20 11:46	10/21/20 09:53	7782-49-2	
Silver	**<0.10**	mg/L	0.10	0.0029	1	10/20/20 11:46	10/21/20 09:53	7440-22-4	
7470A Mercury, TCLP	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Leachate Method/Date: EPA 1311; 10/19/20 13:32 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
Mercury	**<0.60**	ug/L	0.60	0.24	1	10/20/20 12:32	10/21/20 14:52	7439-97-6	
8270E MSSV TCLP	Analytical Method: EPA 8270E Preparation Method: EPA 3510C Leachate Method/Date: EPA 1311; 10/20/20 09:22 Initial pH: 9.59; Final pH: 2.23 Pace Analytical Services - Minneapolis								
1,4-Dichlorobenzene	**<100**	ug/L	100	19.6	1	10/20/20 14:22	10/21/20 17:39	106-46-7	
2,4-Dinitrotoluene	**<100**	ug/L	100	16.3	1	10/20/20 14:22	10/21/20 17:39	121-14-2	
Hexachloro-1,3-butadiene	**<100**	ug/L	100	23.1	1	10/20/20 14:22	10/21/20 17:39	87-68-3	
Hexachlorobenzene	**<100**	ug/L	100	12.7	1	10/20/20 14:22	10/21/20 17:39	118-74-1	
Hexachloroethane	**<100**	ug/L	100	37.0	1	10/20/20 14:22	10/21/20 17:39	67-72-1	
2-Methylphenol(o-Cresol)	**<100**	ug/L	100	13.9	1	10/20/20 14:22	10/21/20 17:39	95-48-7	
3&4-Methylphenol(m&p Cresol)	**<100**	ug/L	100	14.8	1	10/20/20 14:22	10/21/20 17:39		
Nitrobenzene	**<100**	ug/L	100	16.5	1	10/20/20 14:22	10/21/20 17:39	98-95-3	
Pentachlorophenol	**<200**	ug/L	200	58.9	1	10/20/20 14:22	10/21/20 17:39	87-86-5	
Pyridine	**<100**	ug/L	100	19.5	1	10/20/20 14:22	10/21/20 17:39	110-86-1	
2,4,5-Trichlorophenol	**<100**	ug/L	100	8.6	1	10/20/20 14:22	10/21/20 17:39	95-95-4	
2,4,6-Trichlorophenol	**<100**	ug/L	100	10.1	1	10/20/20 14:22	10/21/20 17:39	88-06-2	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Sample: IDW01 TCLP **Lab ID: 10535889001** Collected: 10/16/20 13:00 Received: 10/16/20 13:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270E MSSV TCLP	Analytical Method: EPA 8270E Preparation Method: EPA 3510C								
	Leachate Method/Date: EPA 1311; 10/20/20 09:22 Initial pH: 9.59; Final pH: 2.23								
	Pace Analytical Services - Minneapolis								
Surrogates									
Nitrobenzene-d5 (S)	75	%.	41-125		1	10/20/20 14:22	10/21/20 17:39	4165-60-0	
2-Fluorobiphenyl (S)	65	%.	38-125		1	10/20/20 14:22	10/21/20 17:39	321-60-8	
p-Terphenyl-d14 (S)	86	%.	69-125		1	10/20/20 14:22	10/21/20 17:39	1718-51-0	
Phenol-d6 (S)	22	%.	10-125		1	10/20/20 14:22	10/21/20 17:39	13127-88-3	
2-Fluorophenol (S)	35	%.	30-125		1	10/20/20 14:22	10/21/20 17:39	367-12-4	
2,4,6-Tribromophenol (S)	79	%.	57-125		1	10/20/20 14:22	10/21/20 17:39	118-79-6	
8260D MSV TCLP	Analytical Method: EPA 8260D Leachate Method/Date: EPA 1311; 10/20/20 14:01								
	Pace Analytical Services - Minneapolis								
Benzene	**<25.0**	ug/L	25.0	3.0	1		10/22/20 19:49	71-43-2	
2-Butanone (MEK)	**48.7J**	ug/L	125	22.1	1		10/22/20 19:49	78-93-3	
Carbon tetrachloride	**<25.0**	ug/L	25.0	4.2	1		10/22/20 19:49	56-23-5	v2
Chlorobenzene	**<25.0**	ug/L	25.0	1.9	1		10/22/20 19:49	108-90-7	
Chloroform	**<25.0**	ug/L	25.0	12.1	1		10/22/20 19:49	67-66-3	
1,4-Dichlorobenzene	**<25.0**	ug/L	25.0	2.0	1		10/22/20 19:49	106-46-7	
1,2-Dichloroethane	**<25.0**	ug/L	25.0	6.4	1		10/22/20 19:49	107-06-2	
1,1-Dichloroethene	**<25.0**	ug/L	25.0	3.2	1		10/22/20 19:49	75-35-4	v2
Tetrachloroethene	**<25.0**	ug/L	25.0	4.4	1		10/22/20 19:49	127-18-4	
Trichloroethene	**<10.0**	ug/L	10.0	3.7	1		10/22/20 19:49	79-01-6	
Vinyl chloride	**<5.0**	ug/L	5.0	2.5	1		10/22/20 19:49	75-01-4	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		10/22/20 19:49	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		10/22/20 19:49	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		10/22/20 19:49	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705498
QC Batch Method: EPA 7470A
Analysis Method: EPA 7470A
Analysis Description: 7470A Mercury TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3769133 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.60	0.60	0.24	10/21/20 14:59	

METHOD BLANK: 3767812 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.60	0.60	0.24	10/21/20 14:55	

METHOD BLANK: 3767813 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.60	0.60	0.24	10/21/20 14:57	

LABORATORY CONTROL SAMPLE: 3769134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	15	15.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769135 3769136

Parameter	Units	12152364001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	15	15	14.9	15.0	100	100	80-120	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705501
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010D TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3769144 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.50	0.50	0.019	10/21/20 08:51	
Barium	mg/L	0.0054J	1.0	0.0033	10/21/20 08:51	
Cadmium	mg/L	<0.050	0.050	0.0016	10/21/20 08:51	
Chromium	mg/L	<0.50	0.50	0.0033	10/21/20 08:51	
Lead	mg/L	<0.50	0.50	0.0098	10/21/20 08:51	
Selenium	mg/L	<0.10	0.10	0.029	10/21/20 08:51	
Silver	mg/L	<0.10	0.10	0.0029	10/21/20 08:51	

METHOD BLANK: 3767812 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.50	0.50	0.019	10/21/20 08:54	
Barium	mg/L	0.0053J	1.0	0.0033	10/21/20 08:54	
Cadmium	mg/L	<0.050	0.050	0.0016	10/21/20 08:54	
Chromium	mg/L	0.0033J	0.50	0.0033	10/21/20 08:54	
Lead	mg/L	<0.50	0.50	0.0098	10/21/20 08:54	
Selenium	mg/L	<0.10	0.10	0.029	10/21/20 08:54	
Silver	mg/L	<0.10	0.10	0.0029	10/21/20 08:54	

METHOD BLANK: 3767813 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.50	0.50	0.019	10/21/20 08:56	
Barium	mg/L	0.0039J	1.0	0.0033	10/21/20 08:56	
Cadmium	mg/L	<0.050	0.050	0.0016	10/21/20 08:56	
Chromium	mg/L	<0.50	0.50	0.0033	10/21/20 08:56	
Lead	mg/L	<0.50	0.50	0.0098	10/21/20 08:56	
Selenium	mg/L	<0.10	0.10	0.029	10/21/20 08:56	
Silver	mg/L	<0.10	0.10	0.0029	10/21/20 08:56	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

LABORATORY CONTROL SAMPLE: 3769145

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	5	4.8	95	80-120	
Barium	mg/L	5	4.9	97	80-120	
Cadmium	mg/L	5	4.8	97	80-120	
Chromium	mg/L	5	4.8	96	80-120	
Lead	mg/L	5	4.7	95	80-120	
Selenium	mg/L	5	4.8	97	80-120	
Silver	mg/L	2.5	2.4	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769146 3769147

Parameter	Units	10535800001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	<500 ug/L	5	5	4.9	4.9	98	98	75-125	1	20	
Barium	mg/L	<1000 ug/L	5	5	5.4	5.4	99	98	75-125	1	20	
Cadmium	mg/L	<0.050	5	5	4.9	4.9	99	98	75-125	1	20	
Chromium	mg/L	<500 ug/L	5	5	4.9	4.9	98	97	75-125	1	20	
Lead	mg/L	<0.50	5	5	4.8	4.8	95	95	75-125	0	20	
Selenium	mg/L	<100 ug/L	5	5	5.0	4.9	99	99	75-125	1	20	
Silver	mg/L	<100 ug/L	2.5	2.5	2.4	2.5	98	98	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 706218
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3772706 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1-Dichloroethene	ug/L	<25.0	25.0	3.2	10/22/20 18:41	v2
1,2-Dichloroethane	ug/L	<25.0	25.0	6.4	10/22/20 18:41	
1,4-Dichlorobenzene	ug/L	<25.0	25.0	2.0	10/22/20 18:41	
2-Butanone (MEK)	ug/L	<125	125	22.1	10/22/20 18:41	
Benzene	ug/L	<25.0	25.0	3.0	10/22/20 18:41	
Carbon tetrachloride	ug/L	<25.0	25.0	4.2	10/22/20 18:41	v2
Chlorobenzene	ug/L	<25.0	25.0	1.9	10/22/20 18:41	
Chloroform	ug/L	<25.0	25.0	12.1	10/22/20 18:41	
Tetrachloroethene	ug/L	<25.0	25.0	4.4	10/22/20 18:41	
Trichloroethene	ug/L	<10.0	10.0	3.7	10/22/20 18:41	
Vinyl chloride	ug/L	<5.0	5.0	2.5	10/22/20 18:41	
1,2-Dichloroethane-d4 (S)	%.	92	75-125		10/22/20 18:41	
4-Bromofluorobenzene (S)	%.	98	75-125		10/22/20 18:41	
Toluene-d8 (S)	%.	98	75-125		10/22/20 18:41	

METHOD BLANK: 3768790 Matrix: Solid
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1-Dichloroethene	ug/L	<25.0	25.0	3.2	10/22/20 18:41	v2
1,2-Dichloroethane	ug/L	<25.0	25.0	6.4	10/22/20 18:41	
1,4-Dichlorobenzene	ug/L	<25.0	25.0	2.0	10/22/20 18:41	
2-Butanone (MEK)	ug/L	<125	125	22.1	10/22/20 18:41	
Benzene	ug/L	<25.0	25.0	3.0	10/22/20 18:41	
Carbon tetrachloride	ug/L	<25.0	25.0	4.2	10/22/20 18:41	v2
Chlorobenzene	ug/L	<25.0	25.0	1.9	10/22/20 18:41	
Chloroform	ug/L	<25.0	25.0	12.1	10/22/20 18:41	
Tetrachloroethene	ug/L	<25.0	25.0	4.4	10/22/20 18:41	
Trichloroethene	ug/L	<10.0	10.0	3.7	10/22/20 18:41	
Vinyl chloride	ug/L	<5.0	5.0	2.5	10/22/20 18:41	
1,2-Dichloroethane-d4 (S)	%.	92	75-125		10/22/20 18:41	
4-Bromofluorobenzene (S)	%.	98	75-125		10/22/20 18:41	
Toluene-d8 (S)	%.	98	75-125		10/22/20 18:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

LABORATORY CONTROL SAMPLE: 3772707

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/L	500	339	68	58-131	v3
1,2-Dichloroethane	ug/L	500	405	81	69-125	
1,4-Dichlorobenzene	ug/L	500	512	102	75-125	
2-Butanone (MEK)	ug/L	2500	2060	82	54-125	
Benzene	ug/L	500	398	80	69-125	
Carbon tetrachloride	ug/L	500	358	72	68-128	v3
Chlorobenzene	ug/L	500	483	97	71-136	
Chloroform	ug/L	500	406	81	70-125	
Tetrachloroethene	ug/L	500	460	92	70-126	
Trichloroethene	ug/L	500	440	88	73-127	
Vinyl chloride	ug/L	500	469	94	59-136	
1,2-Dichloroethane-d4 (S)	%.			90	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			99	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3772708 3772709

Parameter	Units	10535367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1-Dichloroethene	ug/L	ND	500	500	370	359	74	72	61-136	3	30	v3
1,2-Dichloroethane	ug/L	ND	500	500	437	433	87	87	68-125	1	30	
1,4-Dichlorobenzene	ug/L	ND	500	500	551	542	110	108	75-125	2	30	
2-Butanone (MEK)	ug/L	ND	2500	2500	2040	2060	82	82	39-150	1	30	
Benzene	ug/L	ND	500	500	436	429	87	85	67-130	2	30	
Carbon tetrachloride	ug/L	ND	500	500	399	397	80	79	68-133	0	30	v3
Chlorobenzene	ug/L	ND	500	500	526	520	105	104	75-125	1	30	
Chloroform	ug/L	ND	500	500	440	442	87	87	70-125	0	30	
Tetrachloroethene	ug/L	ND	500	500	503	495	101	99	73-134	2	30	
Trichloroethene	ug/L	ND	500	500	476	470	95	94	72-139	1	30	
Vinyl chloride	ug/L	ND	500	500	518	506	104	101	69-132	2	30	
1,2-Dichloroethane-d4 (S)	%.						91	91	75-125			
4-Bromofluorobenzene (S)	%.						97	98	75-125			
Toluene-d8 (S)	%.						100	100	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705526
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8081B
Analysis Description: 8081 GCS Pesticides, TCLP
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535889001

METHOD BLANK: 3769277 Matrix: Solid
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlordane (Technical)	ug/L	<5.0	5.0	0.21	10/23/20 03:00	
Endrin	ug/L	<1.0	1.0	0.021	10/23/20 03:00	
gamma-BHC (Lindane)	ug/L	<0.50	0.50	0.0066	10/23/20 03:00	
Heptachlor	ug/L	<0.50	0.50	0.0095	10/23/20 03:00	
Heptachlor epoxide	ug/L	<0.50	0.50	0.0073	10/23/20 03:00	
Methoxychlor	ug/L	<5.0	5.0	0.17	10/23/20 03:00	
Toxaphene	ug/L	<15.0	15.0	0.45	10/23/20 03:00	
Decachlorobiphenyl (S)	%.	98	58-136		10/23/20 03:00	
Tetrachloro-m-xylene (S)	%.	93	74-125		10/23/20 03:00	

LABORATORY CONTROL SAMPLE: 3769278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/L	10	9.7	97	69-138	
gamma-BHC (Lindane)	ug/L	5	4.7	95	68-135	
Heptachlor	ug/L	5	4.3	86	60-131	
Heptachlor epoxide	ug/L	5	4.6	93	68-133	
Methoxychlor	ug/L	50	49.5	99	63-144	
Decachlorobiphenyl (S)	%.			108	58-136	
Tetrachloro-m-xylene (S)	%.			96	74-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769279 3769280

Parameter	Units	10535889001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endrin	ug/L	<5.0	10	10	8.1	8.4	81	84	66-136	3	20	
gamma-BHC (Lindane)	ug/L	<2.5	5	5	3.9	4.1	78	82	64-131	5	20	
Heptachlor	ug/L	<2.5	5	5	2.9	4.2	59	83	48-140	35	20	R1
Heptachlor epoxide	ug/L	<2.5	5	5	4.5	4.7	90	95	70-140	5	20	
Methoxychlor	ug/L	<25.0	50	50	41.4	43.3	83	87	45-150	5	20	
Decachlorobiphenyl (S)	%.						110	111	58-136			
Tetrachloro-m-xylene (S)	%.						53	94	74-125			D3,S0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

QC Batch: 705494
QC Batch Method: EPA 3510C
Analysis Method: EPA 8270E
Analysis Description: 8270E TCLP MSSV
Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10535889001

METHOD BLANK: 3769113 Matrix: Water
Associated Lab Samples: 10535889001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dichlorobenzene	ug/L	<100	100	19.6	10/21/20 13:55	
2,4,5-Trichlorophenol	ug/L	<100	100	8.6	10/21/20 13:55	
2,4,6-Trichlorophenol	ug/L	<100	100	10.1	10/21/20 13:55	
2,4-Dinitrotoluene	ug/L	<100	100	16.3	10/21/20 13:55	
2-Methylphenol(o-Cresol)	ug/L	<100	100	13.9	10/21/20 13:55	
3&4-Methylphenol(m&p Cresol)	ug/L	<100	100	14.8	10/21/20 13:55	
Hexachloro-1,3-butadiene	ug/L	<100	100	23.1	10/21/20 13:55	
Hexachlorobenzene	ug/L	<100	100	12.7	10/21/20 13:55	
Hexachloroethane	ug/L	<100	100	37.0	10/21/20 13:55	
Nitrobenzene	ug/L	<100	100	16.5	10/21/20 13:55	
Pentachlorophenol	ug/L	<200	200	58.9	10/21/20 13:55	
Pyridine	ug/L	<100	100	19.5	10/21/20 13:55	
2,4,6-Tribromophenol (S)	%.	76	57-125		10/21/20 13:55	
2-Fluorobiphenyl (S)	%.	62	38-125		10/21/20 13:55	
2-Fluorophenol (S)	%.	31	30-125		10/21/20 13:55	
Nitrobenzene-d5 (S)	%.	71	41-125		10/21/20 13:55	
p-Terphenyl-d14 (S)	%.	85	69-125		10/21/20 13:55	
Phenol-d6 (S)	%.	20	10-125		10/21/20 13:55	

LABORATORY CONTROL SAMPLE: 3769114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	500	246	49	30-125	
2,4,5-Trichlorophenol	ug/L	500	363	73	65-125	
2,4,6-Trichlorophenol	ug/L	500	358	72	64-125	
2,4-Dinitrotoluene	ug/L	500	396	79	60-125	
2-Methylphenol(o-Cresol)	ug/L	500	226	45	45-125	
3&4-Methylphenol(m&p Cresol)	ug/L	500	203	41	37-125	
Hexachloro-1,3-butadiene	ug/L	500	212	42	30-125	
Hexachlorobenzene	ug/L	500	390	78	67-125	
Hexachloroethane	ug/L	500	207	41	30-125	
Nitrobenzene	ug/L	500	360	72	57-125	
Pentachlorophenol	ug/L	500	373	75	40-125	
Pyridine	ug/L	500	160	32	30-125	
2,4,6-Tribromophenol (S)	%.			75	57-125	
2-Fluorobiphenyl (S)	%.			66	38-125	
2-Fluorophenol (S)	%.			28	30-125	S0
Nitrobenzene-d5 (S)	%.			71	41-125	
p-Terphenyl-d14 (S)	%.			79	69-125	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

LABORATORY CONTROL SAMPLE: 3769114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenol-d6 (S)	%.			18	10-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3769115 3769116

Parameter	Units	10535367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dichlorobenzene	ug/L	ND	500	500	259	272	52	54	30-125	5	30	
2,4,5-Trichlorophenol	ug/L	ND	500	500	414	407	83	81	57-125	2	30	
2,4,6-Trichlorophenol	ug/L	ND	500	500	415	411	83	82	58-125	1	30	
2,4-Dinitrotoluene	ug/L	ND	500	500	423	418	85	84	57-125	1	30	
2-Methylphenol(o-Cresol)	ug/L	ND	500	500	258	261	52	52	34-125	1	30	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	500	500	240	238	48	48	31-125	1	30	
Hexachloro-1,3-butadiene	ug/L	ND	500	500	232	249	46	50	30-125	7	30	
Hexachlorobenzene	ug/L	ND	500	500	441	442	88	88	62-125	0	30	
Hexachloroethane	ug/L	ND	500	500	210	227	42	45	30-125	8	30	
Nitrobenzene	ug/L	ND	500	500	361	380	72	76	52-125	5	30	
Pentachlorophenol	ug/L	ND	500	500	473	482	95	96	30-130	2	30	
Pyridine	ug/L	ND	500	500	147	163	29	33	30-125	10	30	M1
2,4,6-Tribromophenol (S)	%.						94	93	57-125			
2-Fluorobiphenyl (S)	%.						75	75	38-125			
2-Fluorophenol (S)	%.						37	36	30-125			
Nitrobenzene-d5 (S)	%.						74	76	41-125			
p-Terphenyl-d14 (S)	%.						88	87	69-125			
Phenol-d6 (S)	%.						24	24	10-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
v2	The continuing calibration verification was below the method acceptance limit. The analyte was not detected in the associated samples and the sensitivity of the instrument was verified with a reporting limit check standard.
v3	The continuing calibration verification was below the method acceptance limit. Any detection for the analyte in the associated samples may have a low bias.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535889

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10535889001	**IDW01 TCLP**	EPA Mod. 3510C	705526	EPA 8081B	706206
10535889001	**IDW01 TCLP**	EPA 3010A	705501	EPA 6010D	705682
10535889001	**IDW01 TCLP**	EPA 7470A	705498	EPA 7470A	705616
10535889001	**IDW01 TCLP**	EPA 3510C	705494	EPA 8270E	705879
10535889001	**IDW01 TCLP**	EPA 8260D	706218		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information		Section E — MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Number	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:	tharsch@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: none	none	none	none	Requested Analysis: TCLP Semivolatiles (EPA 8270D/1311)	TCLP Metals (RCRA) - (EPA 6010C, 1311, 7470)	TCLP Pesticides (EPA 8081B/1311)	TCLP VOCs (EPA 8260B/1311)	Comments
1	~~IDW01 TCLP~~ IDW01 TCLP		Sample	G	SO	SD	Soil-Sub	101620	~~1130~~ 1300	4	X	X	X	X					001
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

WO# : 10535889

10535889

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Kay Colter BayWest	10/16/20	13:55	[signature]	10-16-20	1355	1-2

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: [signature]

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/16/20

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10535889

PM: CL1 Due Date: 10/30/20

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☒T5(0489) **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.1 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 1.2 °C

USDA Regulated Soil: (☒N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☒No

Date/Initials of Person Examining Contents: 10/16/20 JN

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☒No CL1 10/19/20

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		8.
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☐Water ☒Soil ☐Oil ☐Other_____	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☒N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 10/19/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: MKL (2)

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

October 30, 2020

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Lynch
colin.lynch@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Pace Analytical Services - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Massachusetts DWP Certification #: via MN 027-053-137
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10535891001	**SB-16 (25-27.5)**	Solid	10/13/20 09:50	10/16/20 13:56
10535891002	**SB-17 (0-5)**	Solid	10/13/20 11:40	10/16/20 13:56
10535891003	**SB-18 (2.5-7.5)**	Solid	10/12/20 15:30	10/16/20 13:56
10535891004	**MW-05 (40-45)**	Solid	10/13/20 16:40	10/16/20 13:56
10535891005	**MW-05 (40-45) DUP**	Solid	10/13/20 16:45	10/16/20 13:56
10535891006	**MW-06 (20-22.5)**	Solid	10/14/20 16:00	10/16/20 13:56
10535891007	**MW-07 (10-15)**	Solid	10/15/20 13:30	10/16/20 13:56
10535891008	**MW-08 (7.5-12.5)**	Solid	10/16/20 10:00	10/16/20 13:56

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10535891001	**SB-16 (25-27.5)**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1
10535891002	**SB-17 (0-5)**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1
10535891003	**SB-18 (2.5-7.5)**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1
10535891004	**MW-05 (40-45)**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1
10535891005	**MW-05 (40-45) DUP**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1
10535891006	**MW-06 (20-22.5)**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1
10535891007	**MW-07 (10-15)**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1
10535891008	**MW-08 (7.5-12.5)**	WI MOD DRO	TT2	2
		ASTM D2974	JDL	1

PASI-M = Pace Analytical Services - Minneapolis

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Method: **WI MOD DRO**
Description: WIDRO GCS Silica Gel
Client: Bay West LLC
Date: October 30, 2020

General Information:
8 samples were analyzed for WI MOD DRO by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 705487

T6: High boiling point hydrocarbons are present in the sample.

- SB-17 (0-5) (Lab ID: 10535891002)
  - WDRO C10-C28
- SB-18 (2.5-7.5) (Lab ID: 10535891003)
  - WDRO C10-C28

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: SB-16 (25-27.5) **Lab ID: 10535891001** Collected: 10/13/20 09:50 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<8.2**	mg/kg	8.2	2.2	1	10/20/20 15:40	10/21/20 14:51		
Surrogates									
n-Triacontane (S)	76	%.	30-150		1	10/20/20 15:40	10/21/20 14:51	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**10.3**	%	0.10	0.10	1		10/27/20 15:33		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: SB-17 (0-5) **Lab ID: 10535891002** Collected: 10/13/20 11:40 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**117**	mg/kg	44.9	12.0	5	10/20/20 15:40	10/23/20 09:17		T6
Surrogates									
n-Triacontane (S)	96	%.	30-150		5	10/20/20 15:40	10/23/20 09:17	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**17.6**	%	0.10	0.10	1		10/27/20 15:33		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: SB-18 (2.5-7.5) **Lab ID: 10535891003** Collected: 10/12/20 15:30 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**20.0**	mg/kg	9.7	2.6	1	10/20/20 15:40	10/21/20 13:42		T6
Surrogates									
n-Triacontane (S)	92	%.	30-150		1	10/20/20 15:40	10/21/20 13:42	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**14.9**	%	0.10	0.10	1		10/27/20 15:33		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: MW-05 (40-45) **Lab ID: 10535891004** Collected: 10/13/20 16:40 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<7.8**	mg/kg	7.8	2.1	1	10/20/20 15:40	10/21/20 14:58		
Surrogates									
n-Triacontane (S)	57	%.	30-150		1	10/20/20 15:40	10/21/20 14:58	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**13.6**	%	0.10	0.10	1		10/27/20 15:33		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: MW-05 (40-45) DUP **Lab ID: 10535891005** Collected: 10/13/20 16:45 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<8.3**	mg/kg	8.3	2.2	1	10/20/20 15:40	10/21/20 15:05		
Surrogates									
n-Triacontane (S)	78	%.	30-150		1	10/20/20 15:40	10/21/20 15:05	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**9.3**	%	0.10	0.10	1		10/27/20 15:33		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: MW-06 (20-22.5) **Lab ID: 10535891006** Collected: 10/14/20 16:00 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<8.5**	mg/kg	8.5	2.3	1	10/20/20 15:40	10/21/20 14:44		
Surrogates									
n-Triacontane (S)	85	%.	30-150		1	10/20/20 15:40	10/21/20 14:44	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**14.6**	%	0.10	0.10	1		10/27/20 15:33		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: MW-07 (10-15) **Lab ID: 10535891007** Collected: 10/15/20 13:30 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<7.9**	mg/kg	7.9	2.1	1	10/20/20 15:40	10/21/20 15:12		
Surrogates									
n-Triacontane (S)	73	%.	30-150		1	10/20/20 15:40	10/21/20 15:12	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**11.6**	%	0.10	0.10	1		10/27/20 15:34		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Sample: MW-08 (7.5-12.5) **Lab ID: 10535891008** Collected: 10/16/20 10:00 Received: 10/16/20 13:56 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<11.4**	mg/kg	11.4	3.0	1	10/20/20 15:40	10/21/20 14:30		
Surrogates									
n-Triacontane (S)	74	%.	30-150		1	10/20/20 15:40	10/21/20 14:30	638-68-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**43.9**	%	0.10	0.10	1		10/27/20 15:34		N2

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

QC Batch: 706952
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535891001, 10535891002, 10535891003, 10535891004, 10535891005, 10535891006, 10535891007, 10535891008

SAMPLE DUPLICATE: 3777344

Parameter	Units	10535896004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.6	8.5	1	30	N2

SAMPLE DUPLICATE: 3777357

Parameter	Units	10534961058 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	37.2	38.1	2	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

QC Batch: 705487 | Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO | Analysis Description: WIDRO Solid GCV
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10535891001, 10535891002, 10535891003, 10535891004, 10535891005, 10535891006, 10535891007, 10535891008

METHOD BLANK: 3769026 Matrix: Solid
Associated Lab Samples: 10535891001, 10535891002, 10535891003, 10535891004, 10535891005, 10535891006, 10535891007, 10535891008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	<10.0	10.0	2.7	10/21/20 13:14	
n-Triacontane (S)	%.	92	30-150		10/21/20 13:14	

LABORATORY CONTROL SAMPLE & LCSD: 3769027 3769028

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	66.7	67.8	83	85	66-125	2	20	
n-Triacontane (S)	%.				90	86	30-150			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
T6	High boiling point hydrocarbons are present in the sample.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10535891

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10535891001	**SB-16 (25-27.5)**	WI MOD DRO	705487	WI MOD DRO	705997
10535891002	**SB-17 (0-5)**	WI MOD DRO	705487	WI MOD DRO	705997
10535891003	**SB-18 (2.5-7.5)**	WI MOD DRO	705487	WI MOD DRO	705997
10535891004	**MW-05 (40-45)**	WI MOD DRO	705487	WI MOD DRO	705997
10535891005	**MW-05 (40-45) DUP**	WI MOD DRO	705487	WI MOD DRO	705997
10535891006	**MW-06 (20-22.5)**	WI MOD DRO	705487	WI MOD DRO	705997
10535891007	**MW-07 (10-15)**	WI MOD DRO	705487	WI MOD DRO	705997
10535891008	**MW-08 (7.5-12.5)**	WI MOD DRO	705487	WI MOD DRO	705997
10535891001	**SB-16 (25-27.5)**	ASTM D2974	706952		
10535891002	**SB-17 (0-5)**	ASTM D2974	706952		
10535891003	**SB-18 (2.5-7.5)**	ASTM D2974	706952		
10535891004	**MW-05 (40-45)**	ASTM D2974	706952		
10535891005	**MW-05 (40-45) DUP**	ASTM D2974	706952		
10535891006	**MW-06 (20-22.5)**	ASTM D2974	706952		
10535891007	**MW-07 (10-15)**	ASTM D2974	706952		
10535891008	**MW-08 (7.5-12.5)**	ASTM D2974	706952		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Bay West
Customer-Focused Environmental & Industrial Solutions

CHAIN-OF-CUSTOD[illegible] Request Document

The Chain-of-Custody is a L[illegible]. All relevant fields must be completed accurately.

Section A — Required Client Information:

Company:	Bay West
Address:	5 Empire Dr. St.Paul MN, 55103
Project Manager :	Erik Nimlos
Email To:	enimlos@baywest.com
Phone:	651-291-3493
Copy To:	Eweaver@baywest.com

Section B — Required Project Information:

Project Name:	SW#27 Vadnais Heights Demo Landfi
Project Number:	200402
Turnaround Time:	Standard
Site Location (State):	MN
Copy To:	
Copy To:	

Section C — Invoice Information:

Attention:	Accounts Payable
Company Name:	Bay West LLC
Address:	5 Empire Dr. St. Paul, MN 55103
Purchase Order No.	205946

Section D — Laboratory Information

Lab Name:	Pace
Adress:	1700 Elm St. Minneapolis MN, 55414
Lab Project Manager	Colin Lynch
Lab Phone:	612-656-2286

Section E — MPCA Information

COC ID:	
Work Order No.	3000027125
Facility Code:	SW0000136
Project Task Code:	PRJ07786
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

WO# : 10535891

10535891

ITEM #	Location Unique ID	Sample Common ID	Start Depth ft	End Depth ft	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: DRO with silica gel cleanup WI DRO	Preservatives: 2,3,7,8 TCDD (Dioxin) EPA 1613B/8290A	Preservatives: PFAS MDH Guidance PFCs	Comments
1	2001007191	SB-16 (25-27.5)	25	27.5	Sample	G	SO	SD	Soil-Sub	101320	0950	3	X			
2	2001007192	SB-17 (0-5)	0	5	Sample	G	SO	SD	Soil-Sub	101320	1140	3	X			
3	2001007193	SB-18 (2.5-7.5)	2.5	7.5	Sample	G	SO	SD	Soil-Sub	101220	1530	3	X			854577
4	854577	MW-05 (40-45)	40	45	Sample	G	SO	SD	Soil-Sub	101320	1640	5	X	X	X	—
5	~~854578~~	MW-05 (40-45) DUP	40	45	~~QC-FR~~	G	SO	SD	Soil-Sub	101320	1645	5	X	X	X	854580
6	854580	MW-06 (20-22.5)	20	22.5	Sample	G	SO	SD	Soil-Sub	101420	1600	5	X	X	X	854578
7	~~854580~~	MW-07 (10-15)	10	15	Sample	G	SO	SD	Soil-Sub	101520	1330	5	X	X	X	854579
8	854579	MW-08 (7.5-12.5)	7.5	12.5	~~SAMPLE QC-FB~~	G	SO	SD	Soil-Sub	101620	1000	5	X	X	X	
9		TRIP BLANK			QC-TB					101320	0900	2	X	X	X	
10																
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	STEF MAYER / BAYWEST	101620	13:56	[illegible]	10-16-20	1356

SAMPLE CONDITIONS

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: STEF MAYER

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 101620

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: WO#: 10535891

PM: CL1 Due Date: 10/30/20

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☒T5(0489) **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.1 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 1.2 °C

USDA Regulated Soil: (☒N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☒No

Date/Initials of Person Examining Contents: 10/16 20 JN

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☒No CL1 10/19/20

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used?	☒Yes	☐No		8.
-Pace Containers Used?	☒Yes	☐No		
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC?	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
Matrix: ☐Water ☒Soil ☐Oil ☐Other_____				
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☒N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
CL1 10/19/20				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☒Yes	☐No	~~☐N/A~~	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

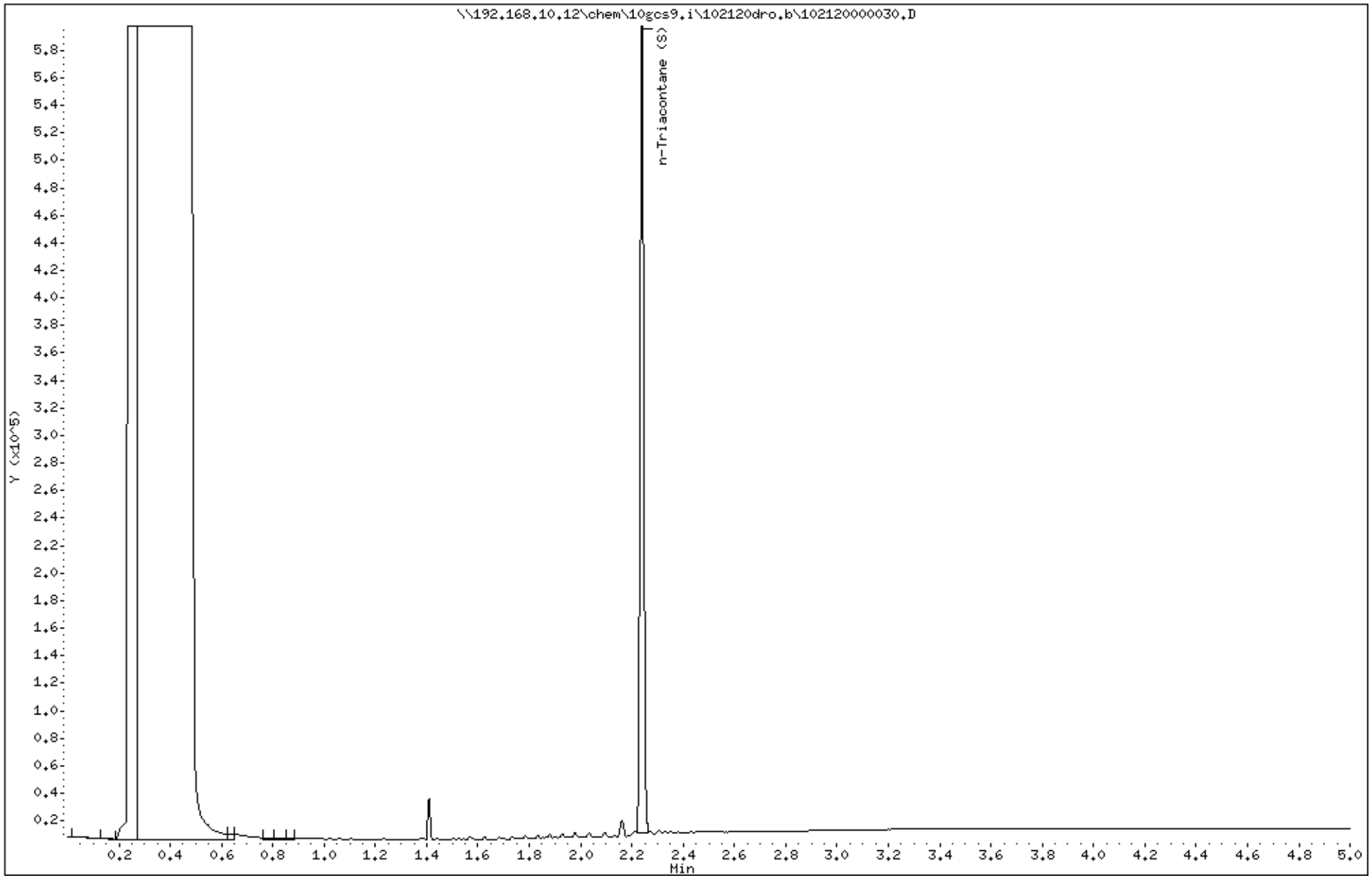
Project Manager Review: _____ **Date:** 10/19/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: MKL

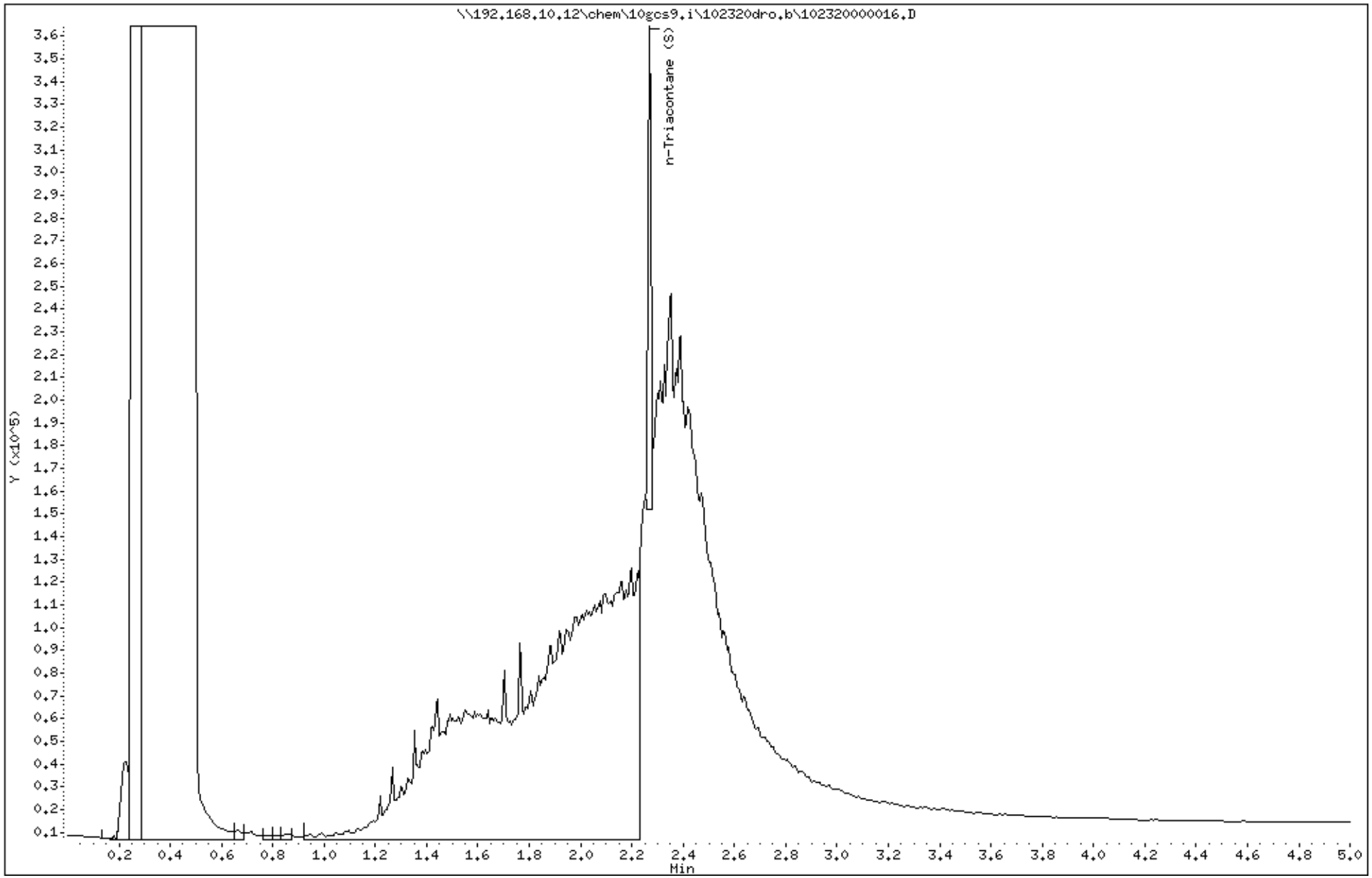
Data File: \\192.168.10.12\chem\10gcs9.i\102120dro.b\102120000030.D
Date : 21-OCT-2020 14:51
Client ID: SB-16 (25-27.5)
Sample Info: 10535891001
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



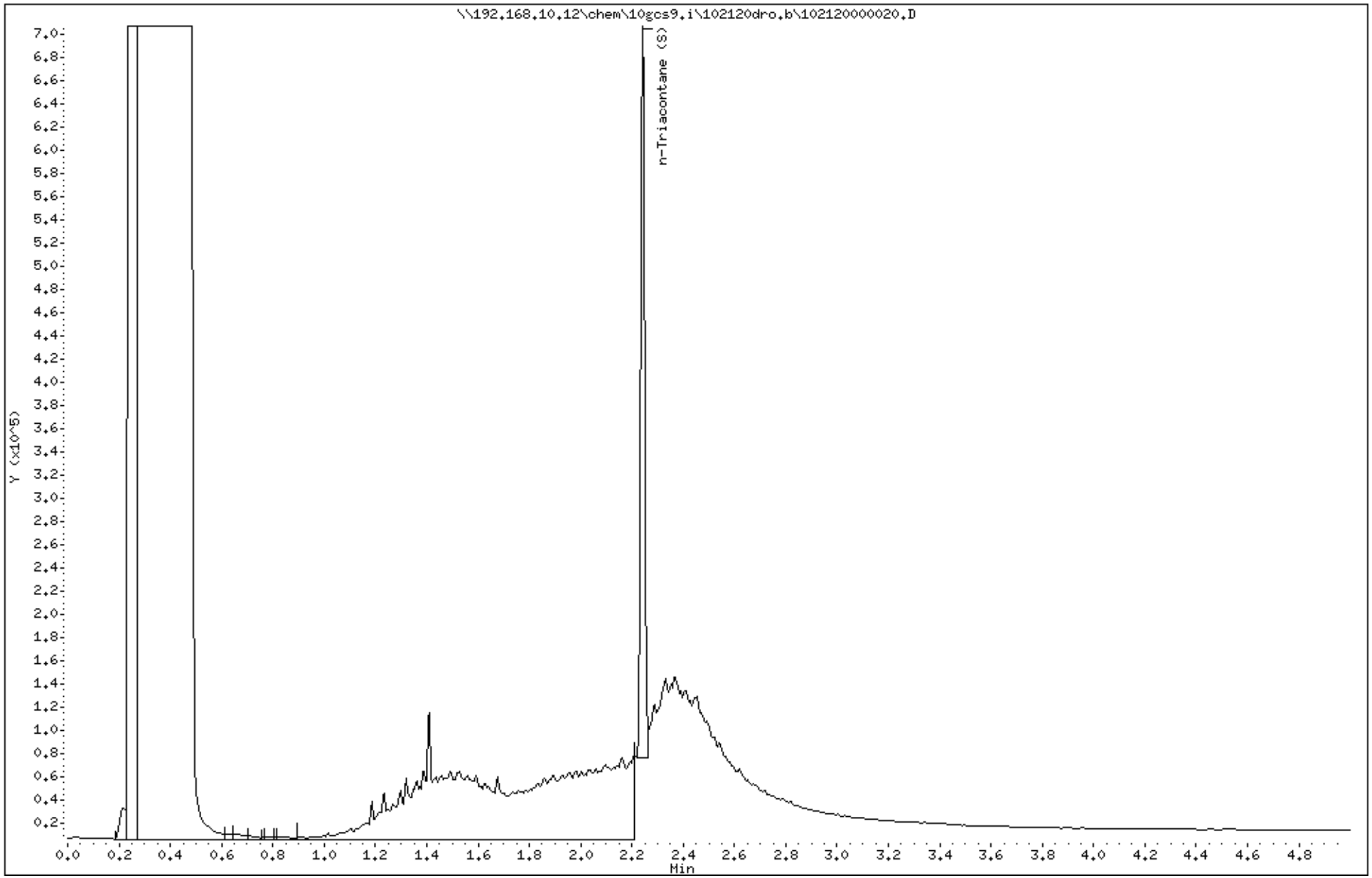
Data File: \\192.168.10.12\chem\10gcs9.i\102320dro.b\102320000016.D
Date : 23-OCT-2020 09:17
Client ID: SB-17 (0-5)
Sample Info: 10535891002X5
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



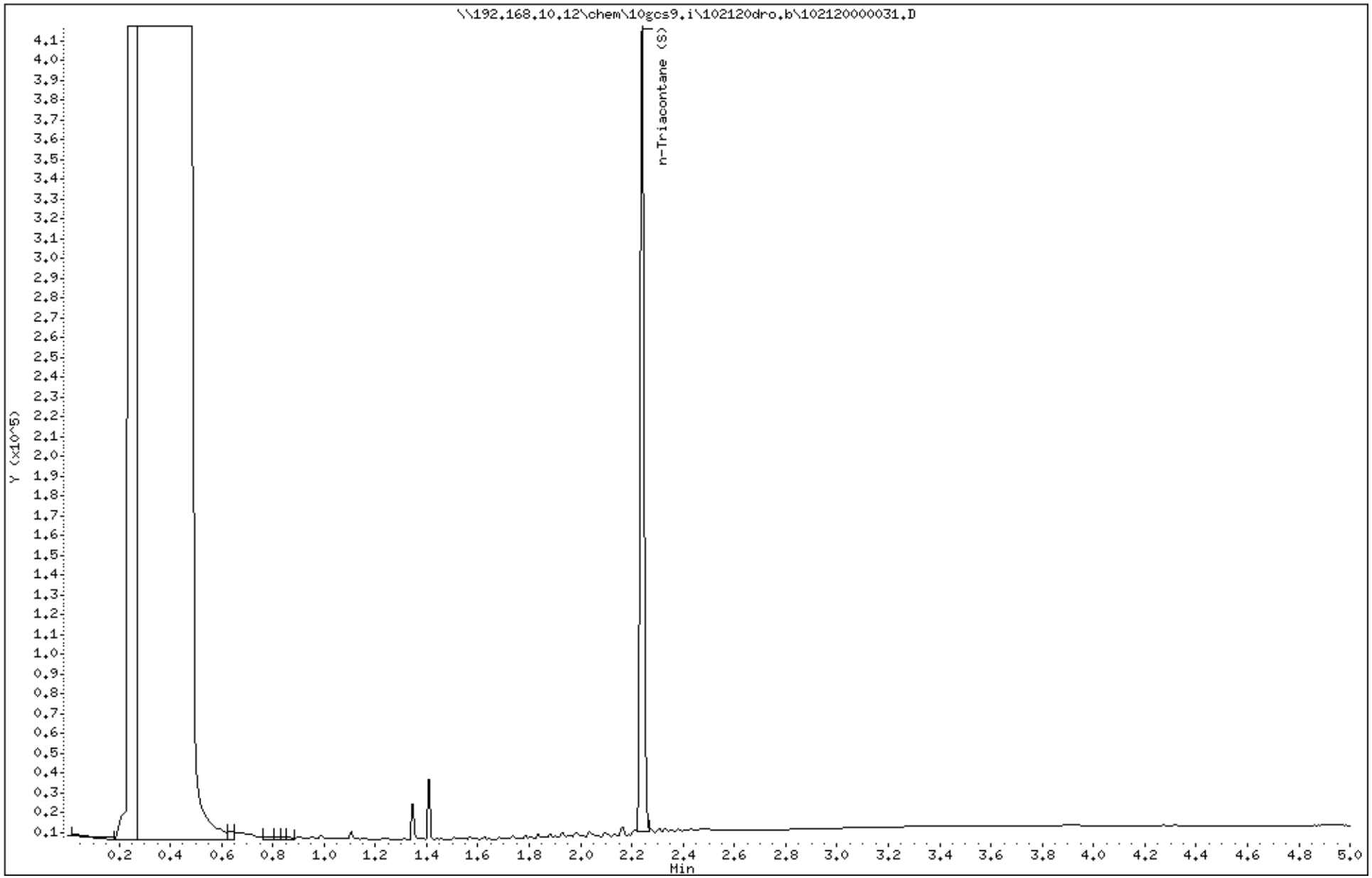
Data File: \\192.168.10.12\chem\10gcs9.i\102120dro.b\102120000020.D
Date : 21-OCT-2020 13:42
Client ID: SB-18 (2.5-7.5)
Sample Info: 10535891003
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



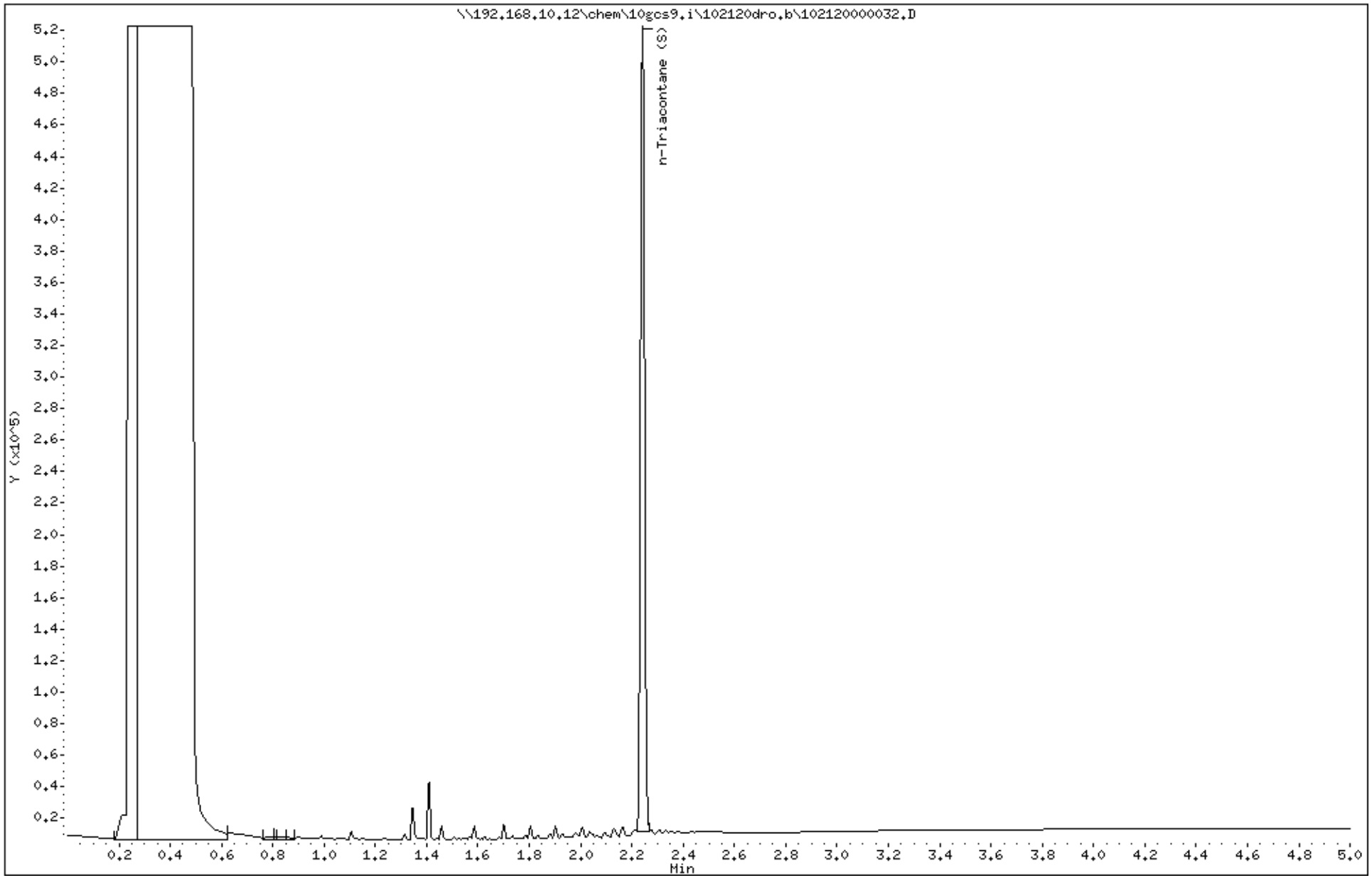
Data File: \\192.168.10.12\chem\10gcs9.i\102120dro.b\102120000031.D
Date : 21-OCT-2020 14:58
Client ID: MW-05 (40-45)
Sample Info: 10535891004
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



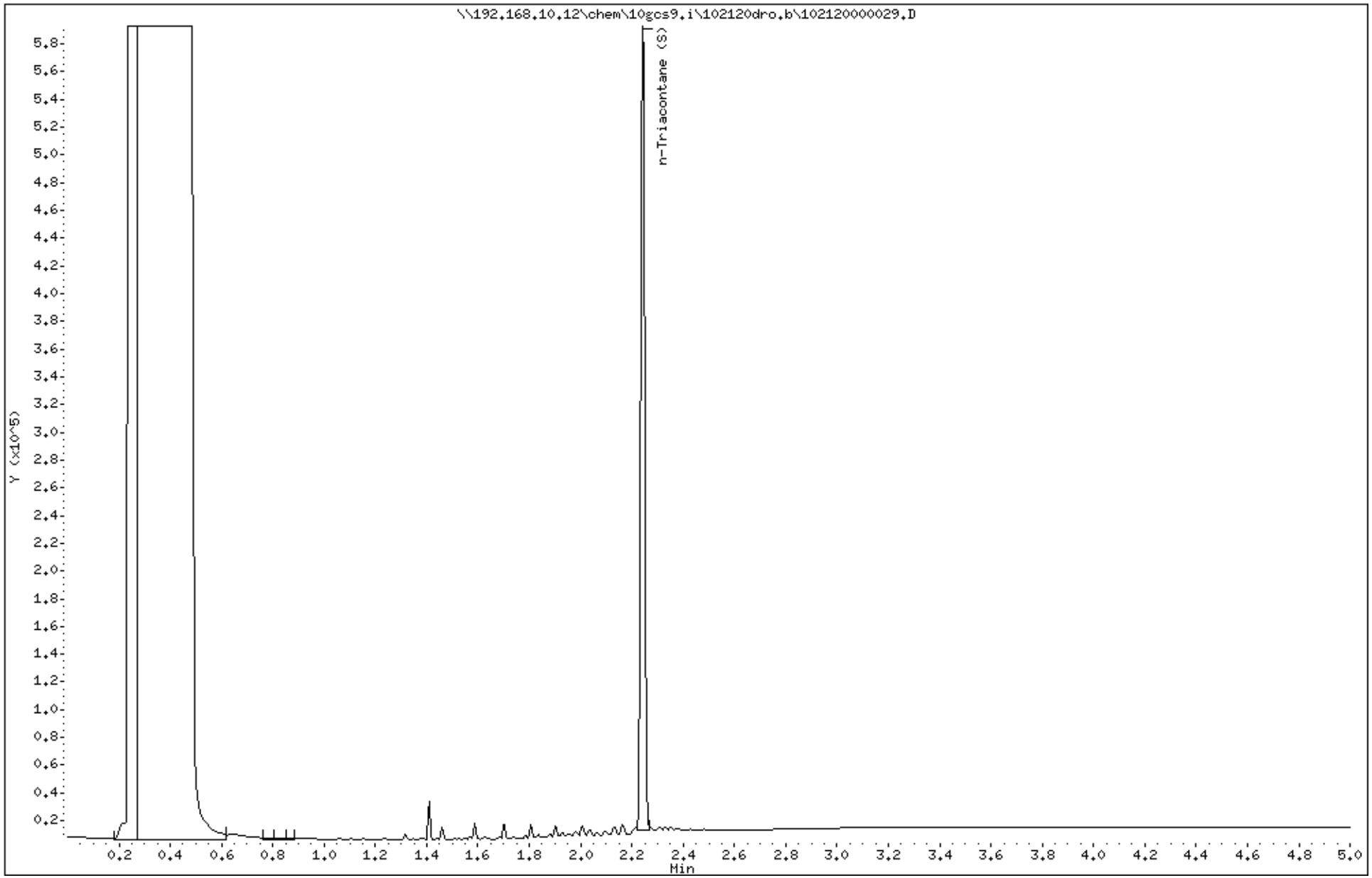
Data File: \\192.168.10.12\chem\10gcs9.i\102120dro.b\102120000032.D
Date : 21-OCT-2020 15:05
Client ID: MW-05 (40-45) DUP
Sample Info: 10535891005
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



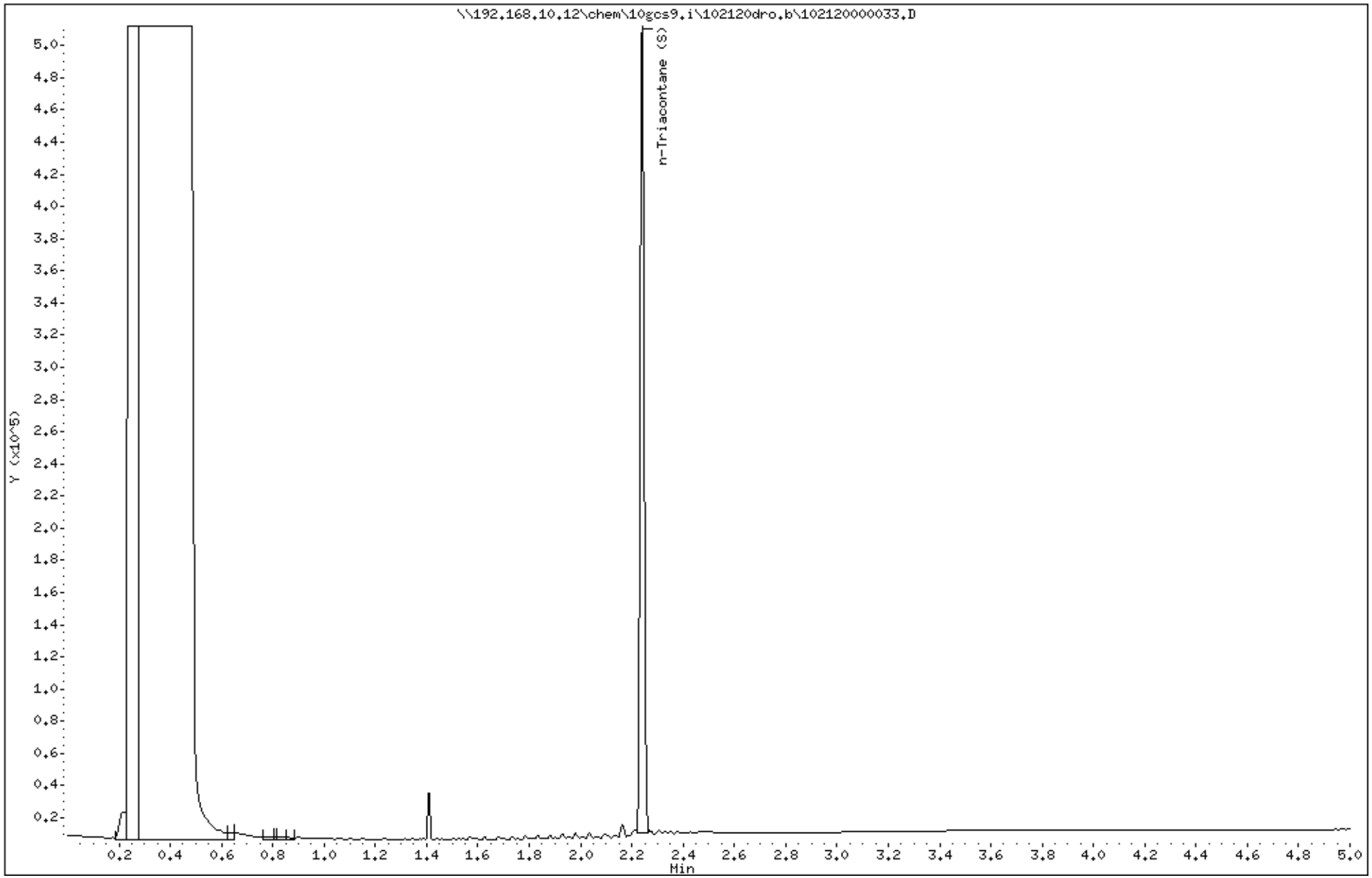
Data File: \\192.168.10.12\chem\10gcs9.i\102120dro.b\102120000029.D
Date : 21-OCT-2020 14:44
Client ID: MW-06 (20-22.5)
Sample Info: 10535891006
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



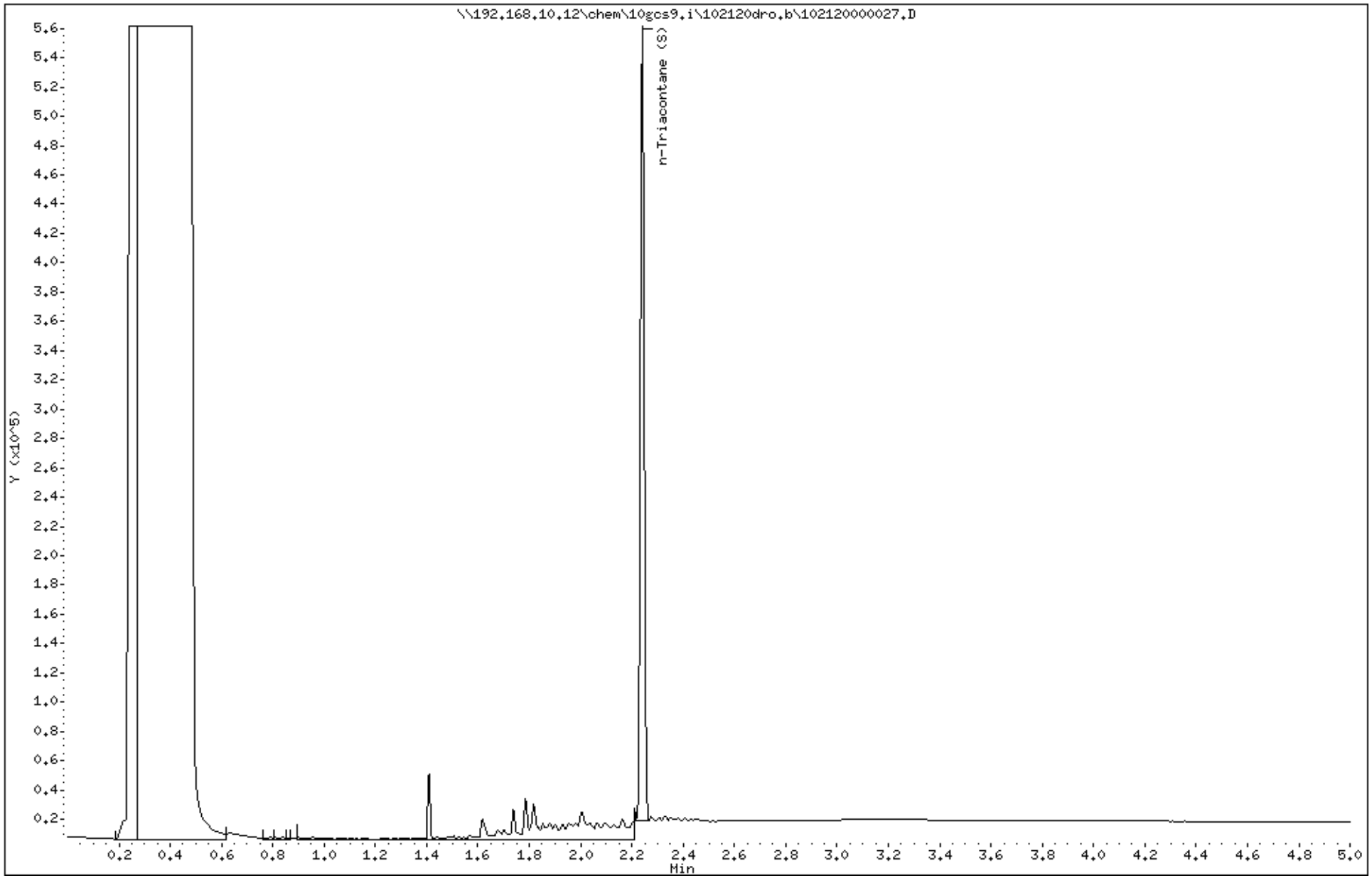
Data File: \\192.168.10.12\chem\10gcs9.i\102120dro.b\102120000033.D
Date : 21-OCT-2020 15:12
Client ID: MW-07 (10-15)
Sample Info: 10535891007
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\102120dro.b\102120000027.D
Date : 21-OCT-2020 14:30
Client ID: MW-08 (7.5-12.5)
Sample Info: 10535891008
Volume Injected (uL): 1.0
Column phase: DB-5-US20240029

Instrument: 10gcs9.i
Operator: TT2
Column diameter: 0.32



Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PFAAs

Report Information:

Pace Project #: 10535893
Sample Receipt Date: 10/16/2020
Client Project #: 200402 SW#27 Vadnais Heights
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Kirsten Hogberg, your Pace Project Manager.

This report has been reviewed by:

October 30, 2020

Kirsten Hogberg, Project Manager
(612) 607-6407
(612) 607-6444 (fax)
kirsten.hogberg@pacelabs.com

Report Prepared Date:
October 30, 2020

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

DISCUSSION

This report presents the results from the analyses performed on five samples, one duplicate, as matrix spike and a matrix spike duplicate submitted by a representative of Bay West LLC. The samples were analyzed for seven perfluorinated compounds using MPCA PFC Guidance. Reporting limits were set to the quantitation limits.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank was free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

A laboratory spike sample and matrix spike samples were also prepared with the sample batch using clean reference matrix or sample material that had been fortified with native standards. The recovery results were within the method limits. The RPDs (relative percent differences) between one laboratory spike and its duplicate were within the method limits. These spikes indicate that extraction performed as expected.

The recoveries of the isotopically-labeled surrogate standards in the sample extracts were within the target ranges specified in the method.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Mississippi	MN00064
A2LA	2926.01	Missouri	10100
Alabama	40770	Montana	CERT0092
Alaska-DW	MN00064	Nebraska	NE-OS-18-06
Alaska-UST	17-009	Nevada	MN00064
Arizona	AZ0014	New Hampshire	2081
Arkansas - WW	88-0680	New Jersey	MN002
Arkansas-DW	MN00064	New York	11647
California	2929	North Carolina-	27700
Colorado	MN00064	North Carolina-	530
Connecticut	PH-0256	North Dakota	R-036
Florida	E87605	Ohio - VAP	CL101
Georgia	959	Ohio-DW	41244
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Massachusetts-	via MN 027-053	West Virginia-D	382
Michigan	9909	West Virginia-D	9952C
Minnesota	027-053-137	Wisconsin	999407970
Minnesota-Ag	via MN 027-053	Wyoming-UST	via A2LA 2926.
Minnesota-Petr	1240		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Laboratory Information		Section E MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landf	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order No.	3000927125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:						Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

WO# : 10535893

10535893

ITEM #	Location Unique ID	Sample Common ID	Start Depth ft	End Depth ft	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: DRO with silica gel cleanup WI DRO	Preservatives: 2,3,7,8 TCDD (Dioxin) EPA 1613B/8290A	Preservatives: PFAS MDH Guidance PFCs	Comments
1	2001007191	SB-16 (25-27.5)	25	27.5	Sample	G	SO	SD	Soil-Sub	101320	0950	3	X			
2	2001007192	SB-17 (0-5)	0	5	Sample	G	SO	SD	Soil-Sub	101320	1140	3	X			
3	2001007193	SB-18 (2.5-7.5)	2.5	7.5	Sample	G	SO	SD	Soil-Sub	101220	1530	3	X			
4	854577	MW-05 (40-45)	40	45	Sample	G	SO	SD	Soil-Sub	101320	1640	5	X	X	X	854577 001
5	~~854578~~	MW-05 (40-45) DUP	40	45	~~SAMPLE~~ QC-FR	G	SO	SD	Soil-Sub	101320	1645	5	X	X	X	— 002
6	854580	MW-06 (20-22.5)	20	22.5	Sample	G	SO	SD	Soil-Sub	101420	1600	5	X	X	X	854580 003
7	854578	MW-07 (10-15)	10	15	Sample	G	SO	SD	Soil-Sub	101520	1330	5	X	X	X	854578 004
8	854579	MW-08 (7.5-12.5)	7.5	12.5	~~SAMPLE~~ QC-FB	G	SO	SD	Soil-Sub	101620	1000	5	X	X	X	854579 005
9		TRIP BLANK			QC-TB					101320	0900	2	X	X	X	
10																
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	STEF MAYER / BAYWEST	10/16/20	13:56	[signature] / FEDEX	10-16-20	1356	1.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: STEF MAYER

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 101620

Report No....10535893_MPCA_DFR

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10535893

PM: KNH Due Date: 10/30/20

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☑Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☑T5(0489) **Type of Ice:** ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No **Were All Container Temps Taken?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.1 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 1.2 °C

USDA Regulated Soil: (☑N/A, water sample/Other:_____) **Date/Initials of Person Examining Contents:** 10/16/20 TN

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑Yes	☐No		1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☑Yes ☑Yes	☐No ☐No		8.
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☐Water ☑Soil ☐Oil ☐Other_____	☑Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☑N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☑N/A	☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☑N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	
Trip Blank Present?	☐Yes	☐No	☑N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Kirsten Hoffberg **Date:** 10/19/2020

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: MLZ

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

		Date Extracted	10/22/2020
Client's Sample ID	MW-05 (40-45)	Total Amount Extracted	2.04 g
Lab Sample ID	10535893001	% Moisture	N/A
Filename	W201023C_012	Dry Weight Extracted	2.04 g
Matrix	Soil	Starting CCal	W201023C_009
Collected	10/13/2020	Ending CCal	W201023C_019
Received	10/16/2020	Method Blank Filename	W201023C_010

Compound	Concentration (ug/Kg)	PQL (ug/Kg)	MDL (ug/Kg)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	0.25	0.092	1	10/23/202016:09	375-22-4	
PFPeA	ND	0.25	0.068	1	10/23/202016:09	2706-90-3	
PFBS	ND	0.22	0.040	1	10/23/202016:09	375-73-5	
PFHxA	ND	0.25	0.046	1	10/23/202016:09	307-24-4	
PFHxS	ND	0.23	0.051	1	10/23/202016:09	355-46-4	
PFOA	ND	0.25	0.046	1	10/23/202016:09	335-67-1	
PFOS	ND	0.24	0.047	1	10/23/202016:09	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.5	77	50 - 150	Pass
13C2_PFDA	2.0	1.7	86	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	719212	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1559447	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	921011	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

		Date Extracted	10/22/2020
Client's Sample ID	MW-05 (40-45)-DUP	Total Amount Extracted	2.17 g
Lab Sample ID	10535893002	% Moisture	N/A
Filename	W201023C_013	Dry Weight Extracted	2.17 g
Matrix	Soil	Starting CCal	W201023C_009
Collected	10/13/2020	Ending CCal	W201023C_019
Received	10/16/2020	Method Blank Filename	W201023C_010

Compound	Concentration (ug/Kg)	PQL (ug/Kg)	MDL (ug/Kg)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	0.23	0.087	1	10/23/202016:17	375-22-4	
PFPeA	ND	0.23	0.064	1	10/23/202016:17	2706-90-3	
PFBS	0.44	0.20	0.038	1	10/23/202016:17	375-73-5	
PFHxA	ND	0.23	0.043	1	10/23/202016:17	307-24-4	
PFHxS	ND	0.22	0.048	1	10/23/202016:17	355-46-4	
PFOA	ND	0.23	0.043	1	10/23/202016:17	335-67-1	
PFOS	ND	0.22	0.044	1	10/23/202016:17	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.6	78	50 - 150	Pass
13C2_PFDA	2.0	1.7	86	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	741572	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1583043	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	937131	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs

Sample Analysis Summary

		Date Extracted	10/22/2020
Client's Sample ID	MW-06 (20-22.5)	Total Amount Extracted	2.14 g
Lab Sample ID	10535893003	% Moisture	N/A
Filename	W201023C_014	Dry Weight Extracted	2.14 g
Matrix	Soil	Starting CCal	W201023C_009
Collected	10/14/2020	Ending CCal	W201023C_019
Received	10/16/2020	Method Blank Filename	W201023C_010

Compound	Concentration (ug/Kg)	PQL (ug/Kg)	MDL (ug/Kg)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	0.23	0.088	1	10/23/202016:26	375-22-4	
PFPeA	ND	0.23	0.064	1	10/23/202016:26	2706-90-3	
PFBS	ND	0.21	0.038	1	10/23/202016:26	375-73-5	
PFHxA	ND	0.23	0.044	1	10/23/202016:26	307-24-4	
PFHxS	ND	0.22	0.048	1	10/23/202016:26	355-46-4	
PFOA	ND	0.23	0.044	1	10/23/202016:26	335-67-1	
PFOS	ND	0.22	0.044	1	10/23/202016:26	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.9	97	50 - 150	Pass
13C2_PFDA	2.0	1.8	91	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	739401	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1596477	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	996426	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

		Date Extracted	10/22/2020
Client's Sample ID	MW-07 (10-15)	Total Amount Extracted	2.11 g
Lab Sample ID	10535893004	% Moisture	N/A
Filename	W201023C_015	Dry Weight Extracted	2.11 g
Matrix	Soil	Starting CCal	W201023C_009
Collected	10/15/2020	Ending CCal	W201023C_019
Received	10/16/2020	Method Blank Filename	W201023C_010

Compound	Concentration (ug/Kg)	PQL (ug/Kg)	MDL (ug/Kg)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	0.24	0.090	1	10/23/202016:34	375-22-4	
PFPeA	ND	0.24	0.066	1	10/23/202016:34	2706-90-3	
PFBS	ND	0.21	0.039	1	10/23/202016:34	375-73-5	
PFHxA	ND	0.24	0.045	1	10/23/202016:34	307-24-4	
PFHxS	ND	0.22	0.049	1	10/23/202016:34	355-46-4	
PFOA	ND	0.24	0.045	1	10/23/202016:34	335-67-1	
PFOS	ND	0.23	0.045	1	10/23/202016:34	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.9	94	50 - 150	Pass
13C2_PFDA	2.0	1.9	97	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	748421	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1596736	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	943242	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs

Sample Analysis Summary

		Date Extracted	10/22/2020
Client's Sample ID	MW-08 (7.5-12.5)	Total Amount Extracted	2.15 g
Lab Sample ID	10535893005	% Moisture	N/A
Filename	A201027C_071	Dry Weight Extracted	2.15 g
Matrix	Soil	Starting CCal	A201027C_064
Collected	10/06/2020	Ending CCal	A201027C_072
Received	10/16/2020	Method Blank Filename	W201023C_010

Compound	Concentration (ug/Kg)	PQL (ug/Kg)	MDL (ug/Kg)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	0.23	0.088	1	10/28/202016:31	375-22-4	
PFPeA	ND	0.23	0.064	1	10/28/202016:31	2706-90-3	
PFBS	ND	0.20	0.038	1	10/28/202016:31	375-73-5	
PFHxA	ND	0.23	0.044	1	10/28/202016:31	307-24-4	
PFHxS	ND	0.22	0.048	1	10/28/202016:31	355-46-4	
PFOA	ND	0.23	0.044	1	10/28/202016:31	335-67-1	
PFOS	ND	0.22	0.044	1	10/28/202016:31	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.6	79	50 - 150	Pass
13C2_PFDA	2.0	1.5	74	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	884692	401018 - 1203053	591225 - 1182451	Pass
13C4_PFOS	1954421	896012 - 2688036	1259842 - 2519684	Pass
d3-MeFOSAA	1445969	489096 - 1467290	886804 - 1773608	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Blank Analysis Summary

Lab Sample ID	BLANK-83422	Date Extracted	10/22/2020
Filename	W201023C_010	Total Amount Extracted	2.02 g
Matrix	Soil	% Moisture	N/A
		Dry Weight Extracted	2.02 g
		Starting CCal	W201023C_009
		Ending CCal	W201023C_019

Compound	Concentration (ug/Kg)	PQL (ug/Kg)	MDL (ug/Kg)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	0.25	0.093	1	10/23/202015:52	375-22-4	
PFPeA	ND	0.25	0.068	1	10/23/202015:52	2706-90-3	
PFBS	ND	0.22	0.041	1	10/23/202015:52	375-73-5	
PFHxA	ND	0.25	0.047	1	10/23/202015:52	307-24-4	
PFHxS	ND	0.23	0.051	1	10/23/202015:52	355-46-4	
PFOA	ND	0.25	0.047	1	10/23/202015:52	335-67-1	
PFOS	ND	0.24	0.047	1	10/23/202015:52	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.9	96	50 - 150	Pass
13C2_PFDA	2.0	1.9	93	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	753317	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1606036	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	955917	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Laboratory Control Sample (LCS)

LCS Lab Sample ID	LCS-83423		
LCS Filename	W201023C_011	Matrix	Soil
Total Amount Extracted	2.01g	Dilution	1
ICAL ID	201019B04	Extracted	10/22/2020
Start CCal Filename	W201023C_009	Analyzed	10/23/2020 16:01
End CCal Filename	W201023C_019	Injected By	NH
Method Blank Filename	W201023C_010		

Compound	**Spiked** (ug/Kg)	**Recovered** (ug/Kg)	**Recovery** %	**Limits**
PFBA	2.5	1.9	78	60.0 - 130.0
PFPeA	2.5	2.1	85	60.0 - 130.0
PFBS	2.2	2.2	102	60.0 - 130.0
PFHxA	2.5	2.2	87	60.0 - 130.0
PFHxS	2.3	2.0	87	60.0 - 130.0
PFOA	2.5	2.3	94	60.0 - 130.0
PFOS	2.4	2.2	92	60.0 - 130.0

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	91	50 - 150	Pass
13C2_PFDA	2.0	1.8	91	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	754557	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1588703	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	927319	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Matrix Spike Sample (MS)

MS Lab Sample ID	10535893004-MS		
MS Filename	W201023C_017	Matrix	Soil
Total Amount Extracted	2.17g	Dilution	1
ICAL ID	201019B04	Extracted	10/22/2020
Start CCal Filename	W201023C_009	Analyzed	10/23/2020 16:51
End CCal Filename	W201023C_019	Injected By	NH
Method Blank Filename			

Compound	Spike (ug/Kg)	Sample (ug/Kg)	Recovered (ug/Kg)	Recovery %	Limits	Flags
PFBA	2.3	0	1.9	84	50.0 - 150.0	
PFPeA	2.3	0	2.0	89	50.0 - 150.0	
PFBS	2.0	0	2.2	107	50.0 - 150.0	
PFHxA	2.3	0	2.1	92	50.0 - 150.0	
PFHxS	2.2	0	2.0	93	50.0 - 150.0	
PFOA	2.3	0	2.3	100	50.0 - 150.0	
PFOS	2.2	0	2.2	99	50.0 - 150.0	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.9	94	50 - 150	Pass
13C2_PFDA	2.0	1.9	94	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	747794	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1617605	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	959360	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Matrix Spike Sample Duplicate (MSD)

MSD Lab Sample ID	10535893004-MSD		
MSD Filename	W201023C_018	MS Filename	W201023C_017
Total Amount Extracted	2.15g	Matrix	Soil
ICAL ID	201019B04	Dilution	1
Start CCal Filename	W201023C_009	Extracted	10/22/2020
End CCal Filename	W201023C_019	Analyzed	10/23/2020 16:59
Method Blank Filename	W201023C_010	Injected By	NH

Compound	Spike (ug/Kg)	Sample (ug/Kg)	Recovered (ug/Kg)	Recovery %	Recovery Limits	Flags	RPD %
PFBA	2.3	0	1.9	82	50.0 - 150.0		2
PFPeA	2.3	0	2.0	88	50.0 - 150.0		0
PFBS	2.1	0	2.2	108	50.0 - 150.0		2
PFHxA	2.3	0	2.1	91	50.0 - 150.0		1
PFHxS	2.2	0	2.0	90	50.0 - 150.0		3
PFOA	2.3	0	2.3	100	50.0 - 150.0		1
PFOS	2.2	0	2.2	98	50.0 - 150.0		0

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	88	50 - 150	Pass
13C2_PFDA	2.0	1.8	88	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	752719	316200 - 948601	506208 - 1012417	Pass
13C4_PFOS	1611244	710866 - 2132597	1119534 - 2239069	Pass
d3-MeFOSAA	947487	343864 - 1031593	648022 - 1296045	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Dr
St. Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

Report Information:

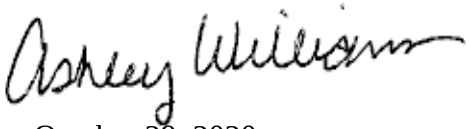
Pace Project #: 10535896
Sample Receipt Date: 10/16/2020
Client Project #: 200402 SW#27 Vadnais Heights
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Ashley Williams, your Pace Project Manager.

This report has been reviewed by:



October 29, 2020

Ashley Williams, Project Manager
(612) 346-8158
(612) 607-6444 (fax)
ashley.williams@pacelabs.com

Report Prepared Date:
October 29, 2020

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on five samples submitted by a representative of BayWest, LLC. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290A. The estimated detection limits (EDLs) were based on signal-to-noise measurements. Estimated maximum possible concentration (EMPC) values were treated as positives in the toxic equivalence calculations.

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 54-104%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290A. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

Values were flagged "I" where incorrect isotope ratios were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates.

A laboratory method blank was prepared and analyzed with each sample batch as part of our routine quality control procedures. The results show Blank-83374 to contain a trace level of OCDF. This level was below the calibration range of the method. The concentration reported for OCDF in an associated field sample was similar to the corresponding blank level, flagged "B" on the results table, and may be, at least partially, attributed to the background. It should be noted that levels less than ten times the background are not generally considered to be statistically different from the background.

A laboratory spike sample was also prepared with each sample batch using clean reference matrix that had been fortified with native standard materials. The results show that the spiked native compounds were recovered at 95-124%. These results were within the target ranges for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Mississippi	MN00064
A2LA	2926.01	Missouri	10100
Alabama	40770	Montana	CERT0092
Alaska-DW	MN00064	Nebraska	NE-OS-18-06
Alaska-UST	17-009	Nevada	MN00064
Arizona	AZ0014	New Hampshire	2081
Arkansas - WW	88-0680	New Jersey	MN002
Arkansas-DW	MN00064	New York	11647
California	2929	North Carolina-	27700
Colorado	MN00064	North Carolina-	530
Connecticut	PH-0256	North Dakota	R-036
Florida	E87605	Ohio - VAP	CL101
Georgia	959	Ohio-DW	41244
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Massachusetts-	via MN 027-053	West Virginia-D	382
Michigan	9909	West Virginia-D	9952C
Minnesota	027-053-137	Wisconsin	999407970
Minnesota-Ag	via MN 027-053	Wyoming-UST	via A2LA 2926.
Minnesota-Petr	1240		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A (Required Client Information)		Section B (Required Project Information)		Section C (Invoice Information)		Section D (Laboratory Information)		Section E (MPCA Information)	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landf	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order No.	3000927125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:						Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

WO# : 10535896

10535896

ITEM #	Location Unique ID	Sample Common ID	Start Depth ft	End Depth ft	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: DRO with silica gel cleanup WI DRO	Preservatives: 2,3,7,8 TCDD (Dioxin) EPA 1613B/8290A	Preservatives: PFAS MDH Guidance PFCs	Comments
1	2001007191	SB-16 (25-27.5)	25	27.5	Sample	G	SO	SD	Soil-Sub	101320	0950	3	X			
2	2001007192	SB-17 (0-5)	0	5	Sample	G	SO	SD	Soil-Sub	101320	1140	3	X			
3	2001007193	SB-18 (2.5-7.5)	2.5	7.5	Sample	G	SO	SD	Soil-Sub	101220	1530	3	X			
4	854577	MW-05 (40-45)	40	45	Sample	G	SO	SD	Soil-Sub	101320	1640	5	X	X	X	854577 001
5	~~854578~~	MW-05 (40-45) DUP	40	45	~~SAMPLE~~ QC-FR	G	SO	SD	Soil-Sub	101320	1645	5	X	X	X	— 002
6	~~854580~~	MW-06 (20-22.5)	20	22.5	Sample	G	SO	SD	Soil-Sub	101420	1600	5	X	X	X	854580 003
7	~~854578~~	MW-07 (10-15)	10	15	Sample	G	SO	SD	Soil-Sub	101520	1330	5	X	X	X	854578 004
8	854579	MW-08 (7.5-12.5)	7.5	12.5	~~SAMPLE~~ QC-FB	G	SO	SD	Soil-Sub	101620	1000	5	X	X	X	854579 005
9		TRIP BLANK			QC-TB					101320	0900	2	X	X	X	
10																
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	STEF MAYER / BAYWEST	101620	15:56		10-16-20	1556	1.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: STEF MAYER

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 101620

Report No....10535896_8290FC_DFR

Pace Analytical®	Document Name: Sample Condition Upon Receipt (SCUR) - MN	Document Revised: 12Aug2020 Page 1 of 1
	Document No.: ENV-FRM-MIN4-0150 Rev.01	Pace Analytical Services - Minneapolis

Sample Condition Upon Receipt

Client Name: Bay West

Project #: WO#: 10535896

PM: AW1 Due Date: 10/30/20

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☑Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☑T5(0489) **Type of Ice:** ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No **Were All Container Temps Taken?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 1.1 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 1.2 °C

USDA Regulated Soil: (☑N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

Date/Initials of Person Examining Contents: 10/16/20 TN

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑Yes	☐No		1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☑Yes ☑Yes	☐No ☐No		8.
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☐Water ☑Soil ☐Oil ☐Other_____	☑Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☑N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☑N/A	☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☑N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	
Trip Blank Present?	☐Yes	☐No	☑N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 10/19/2020

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: MK2

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	MW-05 (40-45)		
Lab Sample ID	10535896001		
Filename	F201023A_13		
Injected By	BAL		
Total Amount Extracted	10.2 g	Matrix	Solid
% Moisture	12.9	Dilution	NA
Dry Weight Extracted	8.88 g	Collected	10/13/2020 16:40
ICAL ID	F200714	Received	10/16/2020 13:56
CCal Filename(s)	F201023A_01 & F201023A_16	Extracted	10/21/2020 17:22
Method Blank ID	BLANK-83435	Analyzed	10/23/2020 18:21

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.29		2,3,7,8-TCDF-13C	2.00	80
Total TCDF	ND	-----	0.29		2,3,7,8-TCDD-13C	2.00	71
					1,2,3,7,8-PeCDF-13C	2.00	93
2,3,7,8-TCDD	ND	-----	0.18		2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	ND	-----	0.18		1,2,3,7,8-PeCDD-13C	2.00	93
					1,2,3,4,7,8-HxCDF-13C	2.00	88
1,2,3,7,8-PeCDF	ND	-----	0.16		1,2,3,6,7,8-HxCDF-13C	2.00	89
2,3,4,7,8-PeCDF	ND	-----	0.086		2,3,4,6,7,8-HxCDF-13C	2.00	91
Total PeCDF	ND	-----	0.086		1,2,3,7,8,9-HxCDF-13C	2.00	80
					1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	-----	0.18		1,2,3,6,7,8-HxCDD-13C	2.00	83
Total PeCDD	ND	-----	0.18		1,2,3,4,6,7,8-HpCDF-13C	2.00	72
					1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	ND	-----	0.22		1,2,3,4,6,7,8-HpCDD-13C	2.00	70
1,2,3,6,7,8-HxCDF	ND	-----	0.12		OCDD-13C	4.00	65
2,3,4,6,7,8-HxCDF	ND	-----	0.26				
1,2,3,7,8,9-HxCDF	ND	-----	0.17		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.12		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.20		2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	-----	0.21				
1,2,3,7,8,9-HxCDD	ND	-----	0.16				
Total HxCDD	ND	-----	0.16				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.16		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.22		Equivalence: 0.00017 ng/Kg		
Total HpCDF	ND	-----	0.16		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.31				
Total HpCDD	ND	-----	0.31				
OCDF	ND	-----	0.53				
OCDD	0.58	-----	0.49	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	MW-05 (40-45) DUP		
Lab Sample ID	10535896002		
Filename	F201023A_14		
Injected By	BAL		
Total Amount Extracted	10.4 g	Matrix	Solid
% Moisture	12.2	Dilution	NA
Dry Weight Extracted	9.11 g	Collected	10/13/2020 16:45
ICAL ID	F200714	Received	10/16/2020 13:56
CCal Filename(s)	F201023A_01 & F201023A_16	Extracted	10/21/2020 17:22
Method Blank ID	BLANK-83435	Analyzed	10/23/2020 19:07

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.20		2,3,7,8-TCDF-13C	2.00	77
Total TCDF	ND	-----	0.20		2,3,7,8-TCDD-13C	2.00	70
					1,2,3,7,8-PeCDF-13C	2.00	96
2,3,7,8-TCDD	ND	-----	0.12		2,3,4,7,8-PeCDF-13C	2.00	99
Total TCDD	0.47	-----	0.12	J	1,2,3,7,8-PeCDD-13C	2.00	98
					1,2,3,4,7,8-HxCDF-13C	2.00	90
1,2,3,7,8-PeCDF	ND	-----	0.074		1,2,3,6,7,8-HxCDF-13C	2.00	91
2,3,4,7,8-PeCDF	ND	-----	0.048		2,3,4,6,7,8-HxCDF-13C	2.00	89
Total PeCDF	ND	-----	0.048		1,2,3,7,8,9-HxCDF-13C	2.00	79
					1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	-----	0.10		1,2,3,6,7,8-HxCDD-13C	2.00	85
Total PeCDD	ND	-----	0.10		1,2,3,4,6,7,8-HpCDF-13C	2.00	77
					1,2,3,4,7,8,9-HpCDF-13C	2.00	75
1,2,3,4,7,8-HxCDF	ND	-----	0.098		1,2,3,4,6,7,8-HpCDD-13C	2.00	74
1,2,3,6,7,8-HxCDF	ND	-----	0.097		OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	ND	-----	0.051				
1,2,3,7,8,9-HxCDF	ND	-----	0.10		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.051		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.11		2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,6,7,8-HxCDD	ND	-----	0.073				
1,2,3,7,8,9-HxCDD	ND	-----	0.060				
Total HxCDD	ND	-----	0.060				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.074		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.056		Equivalence: 0.0018 ng/Kg		
Total HpCDF	ND	-----	0.056		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	0.16	-----	0.11	J			
Total HpCDD	0.38	-----	0.11	J			
OCDF	ND	-----	0.27				
OCDD	-----	0.56	0.20	IJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	MW-06 (20-22.5)		
Lab Sample ID	10535896003		
Filename	F201023A_15		
Injected By	BAL		
Total Amount Extracted	10.8 g	Matrix	Solid
% Moisture	14.6	Dilution	NA
Dry Weight Extracted	9.21 g	Collected	10/14/2020 16:00
ICAL ID	F200714	Received	10/16/2020 13:56
CCal Filename(s)	F201023A_01 & F201023A_16	Extracted	10/21/2020 17:22
Method Blank ID	BLANK-83435	Analyzed	10/23/2020 19:52

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.29		2,3,7,8-TCDF-13C	2.00	66
Total TCDF	ND	-----	0.29		2,3,7,8-TCDD-13C	2.00	63
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	0.42		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	33	-----	0.42		1,2,3,7,8-PeCDD-13C	2.00	97
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	-----	0.11		1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	-----	0.033		2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	0.16	-----	0.033	J	1,2,3,7,8,9-HxCDF-13C	2.00	78
					1,2,3,4,7,8-HxCDD-13C	2.00	85
1,2,3,7,8-PeCDD	ND	-----	0.47		1,2,3,6,7,8-HxCDD-13C	2.00	76
Total PeCDD	28	-----	0.47		1,2,3,4,6,7,8-HpCDF-13C	2.00	71
					1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	0.044		1,2,3,4,6,7,8-HpCDD-13C	2.00	74
1,2,3,6,7,8-HxCDF	ND	-----	0.052		OCDD-13C	4.00	60
2,3,4,6,7,8-HxCDF	ND	-----	0.065				
1,2,3,7,8,9-HxCDF	ND	-----	0.11		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.11	-----	0.044	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.27		2,3,7,8-TCDD-37Cl4	0.20	66
1,2,3,6,7,8-HxCDD	ND	-----	0.22				
1,2,3,7,8,9-HxCDD	ND	-----	0.14				
Total HxCDD	15	-----	0.14				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.062		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.093		Equivalence: 0.0042 ng/Kg		
Total HpCDF	ND	-----	0.062		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	-----	0.35	0.057	IJ			
Total HpCDD	ND	-----	0.057				
OCDF	0.29	-----	0.23	J			
OCDD	2.2	-----	0.34	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	MW-07 (10-15)		
Lab Sample ID	10535896004		
Filename	F201023A_11		
Injected By	BAL		
Total Amount Extracted	10.7 g	Matrix	Solid
% Moisture	8.6	Dilution	NA
Dry Weight Extracted	9.82 g	Collected	10/15/2020 13:30
ICAL ID	F200714	Received	10/16/2020 13:56
CCal Filename(s)	F201023A_01 & F201023A_16	Extracted	10/21/2020 17:24
Method Blank ID	BLANK-83374	Analyzed	10/23/2020 16:51

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.34		2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	-----	0.34		2,3,7,8-TCDD-13C	2.00	62
					1,2,3,7,8-PeCDF-13C	2.00	81
2,3,7,8-TCDD	ND	-----	0.20		2,3,4,7,8-PeCDF-13C	2.00	81
Total TCDD	ND	-----	0.20		1,2,3,7,8-PeCDD-13C	2.00	81
					1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	-----	0.32		1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	ND	-----	0.19		2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	ND	-----	0.19		1,2,3,7,8,9-HxCDF-13C	2.00	71
					1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	ND	-----	0.37		1,2,3,6,7,8-HxCDD-13C	2.00	69
Total PeCDD	ND	-----	0.37		1,2,3,4,6,7,8-HpCDF-13C	2.00	63
					1,2,3,4,7,8,9-HpCDF-13C	2.00	65
1,2,3,4,7,8-HxCDF	ND	-----	0.16		1,2,3,4,6,7,8-HpCDD-13C	2.00	63
1,2,3,6,7,8-HxCDF	ND	-----	0.12		OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	ND	-----	0.16				
1,2,3,7,8,9-HxCDF	ND	-----	0.21		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.12		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.12		2,3,7,8-TCDD-37Cl4	0.20	63
1,2,3,6,7,8-HxCDD	ND	-----	0.12				
1,2,3,7,8,9-HxCDD	ND	-----	0.091				
Total HxCDD	ND	-----	0.091				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.20		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.19		Equivalence: 0.0023 ng/Kg		
Total HpCDF	ND	-----	0.19		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	0.20	-----	0.19	J			
Total HpCDD	0.20	-----	0.19	J			
OCDF	ND	-----	0.39				
OCDD	-----	0.93	0.55	IJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	MW-08 (7.5-12.5)		
Lab Sample ID	10535896005		
Filename	F201023A_12		
Injected By	BAL		
Total Amount Extracted	10.2 g	Matrix	Solid
% Moisture	20.2	Dilution	NA
Dry Weight Extracted	8.14 g	Collected	10/16/2020 10:00
ICAL ID	F200714	Received	10/16/2020 13:56
CCal Filename(s)	F201023A_01 & F201023A_16	Extracted	10/21/2020 17:24
Method Blank ID	BLANK-83374	Analyzed	10/23/2020 17:36

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.51		2,3,7,8-TCDF-13C	2.00	83
Total TCDF	ND	-----	0.51		2,3,7,8-TCDD-13C	2.00	71
					1,2,3,7,8-PeCDF-13C	2.00	103
2,3,7,8-TCDD	ND	-----	0.21		2,3,4,7,8-PeCDF-13C	2.00	102
Total TCDD	3.6	-----	0.21		1,2,3,7,8-PeCDD-13C	2.00	104
					1,2,3,4,7,8-HxCDF-13C	2.00	87
1,2,3,7,8-PeCDF	ND	-----	0.14		1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	-----	0.081		2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	0.29	-----	0.081	J	1,2,3,7,8,9-HxCDF-13C	2.00	85
					1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	ND	-----	0.22		1,2,3,6,7,8-HxCDD-13C	2.00	76
Total PeCDD	3.3	-----	0.22	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	71
					1,2,3,4,7,8,9-HpCDF-13C	2.00	76
1,2,3,4,7,8-HxCDF	ND	-----	0.11		1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	-----	0.11		OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	ND	-----	0.12				
1,2,3,7,8,9-HxCDF	ND	-----	0.15		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.38	-----	0.11	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.15		2,3,7,8-TCDD-37Cl4	0.20	71
1,2,3,6,7,8-HxCDD	ND	-----	0.10				
1,2,3,7,8,9-HxCDD	ND	-----	0.11				
Total HxCDD	3.3	-----	0.10	J			
1,2,3,4,6,7,8-HpCDF	0.83	-----	0.17	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.15		Equivalence: 0.067 ng/Kg		
Total HpCDF	2.4	-----	0.15	J	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	4.5	-----	0.15	J			
Total HpCDD	8.4	-----	0.15				
OCDF	2.6	-----	0.35	BJ			
OCDD	42	-----	0.14				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
J = Estimated value
B = Less than 10x higher than method blank level

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Lab Sample Name	DFBLKAV		
Lab Sample ID	BLANK-83374	Matrix	Solid
Filename	F201023B_06	Dilution	NA
Total Amount Extracted	10.3 g	Extracted	10/21/2020 17:24
ICAL ID	F200714	Analyzed	10/24/2020 01:11
CCal Filename(s)	F201023B_01 & F201023B_18	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.18		2,3,7,8-TCDF-13C	2.00	64
Total TCDF	ND	-----	0.18		2,3,7,8-TCDD-13C	2.00	58
					1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	-----	0.18		2,3,4,7,8-PeCDF-13C	2.00	83
Total TCDD	ND	-----	0.18		1,2,3,7,8-PeCDD-13C	2.00	82
					1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	-----	0.087		1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	ND	-----	0.054		2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	ND	-----	0.054		1,2,3,7,8,9-HxCDF-13C	2.00	63
					1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	-----	0.069		1,2,3,6,7,8-HxCDD-13C	2.00	70
Total PeCDD	ND	-----	0.069		1,2,3,4,6,7,8-HpCDF-13C	2.00	71
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	ND	-----	0.067		1,2,3,4,6,7,8-HpCDD-13C	2.00	69
1,2,3,6,7,8-HxCDF	ND	-----	0.073		OCDD-13C	4.00	52
2,3,4,6,7,8-HxCDF	ND	-----	0.067				
1,2,3,7,8,9-HxCDF	ND	-----	0.089		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.067		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.085		2,3,7,8-TCDD-37Cl4	0.20	61
1,2,3,6,7,8-HxCDD	ND	-----	0.095				
1,2,3,7,8,9-HxCDD	ND	-----	0.067				
Total HxCDD	ND	-----	0.067				
1,2,3,4,6,7,8-HpCDF	-----	0.084	0.081	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.13		Equivalence: 0.0011 ng/Kg		
Total HpCDF	ND	-----	0.081		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.18				
Total HpCDD	ND	-----	0.18				
OCDF	0.35	-----	0.24	J			
OCDD	-----	0.48	0.34	IJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Lab Sample Name	DFBLKBU		
Lab Sample ID	BLANK-83435	Matrix	Solid
Filename	F201024A_04	Dilution	NA
Total Amount Extracted	10.4 g	Extracted	10/21/2020 17:22
ICAL ID	F200714	Analyzed	10/24/2020 14:57
CCal Filename(s)	F201023B_18 & F201024A_14	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.28		2,3,7,8-TCDF-13C	2.00	79
Total TCDF	ND	-----	0.28		2,3,7,8-TCDD-13C	2.00	71
					1,2,3,7,8-PeCDF-13C	2.00	97
2,3,7,8-TCDD	ND	-----	0.66		2,3,4,7,8-PeCDF-13C	2.00	102
Total TCDD	ND	-----	0.66		1,2,3,7,8-PeCDD-13C	2.00	102
					1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	-----	0.29		1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	-----	0.21		2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	ND	-----	0.21		1,2,3,7,8,9-HxCDF-13C	2.00	79
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	-----	0.33		1,2,3,6,7,8-HxCDD-13C	2.00	76
Total PeCDD	ND	-----	0.33		1,2,3,4,6,7,8-HpCDF-13C	2.00	69
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	ND	-----	0.16		1,2,3,4,6,7,8-HpCDD-13C	2.00	70
1,2,3,6,7,8-HxCDF	ND	-----	0.15		OCDD-13C	4.00	52
2,3,4,6,7,8-HxCDF	ND	-----	0.16				
1,2,3,7,8,9-HxCDF	ND	-----	0.26		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.15		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.15		2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	-----	0.11				
1,2,3,7,8,9-HxCDD	ND	-----	0.11				
Total HxCDD	ND	-----	0.11				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.13		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.26		Equivalence: 0.00011 ng/Kg		
Total HpCDF	ND	-----	0.13		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.20				
Total HpCDD	ND	-----	0.20				
OCDF	ND	-----	0.46				
OCDD	-----	0.37	0.29	IJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
J = Estimated value
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCS-83436		
Filename	F201023B_02	Matrix	Solid
Total Amount Extracted	10.6 g	Dilution	NA
ICAL ID	F200714	Extracted	10/21/2020 17:22
CCal Filename(s)	F201023B_01 & F201023B_18	Analyzed	10/23/2020 22:09
Method Blank ID	BLANK-83435	Injected By	BAL

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.22	110	2,3,7,8-TCDF-13C	2.0	78
Total TCDF				2,3,7,8-TCDD-13C	2.0	69
				1,2,3,7,8-PeCDF-13C	2.0	85
2,3,7,8-TCDD	0.20	0.22	112	2,3,4,7,8-PeCDF-13C	2.0	84
Total TCDD				1,2,3,7,8-PeCDD-13C	2.0	83
				1,2,3,4,7,8-HxCDF-13C	2.0	84
1,2,3,7,8-PeCDF	1.0	1.0	101	1,2,3,6,7,8-HxCDF-13C	2.0	84
2,3,4,7,8-PeCDF	1.0	0.97	97	2,3,4,6,7,8-HxCDF-13C	2.0	83
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.0	75
				1,2,3,4,7,8-HxCDD-13C	2.0	77
1,2,3,7,8-PeCDD	1.0	0.99	99	1,2,3,6,7,8-HxCDD-13C	2.0	75
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.0	64
				1,2,3,4,7,8,9-HpCDF-13C	2.0	64
1,2,3,4,7,8-HxCDF	1.0	1.1	106	1,2,3,4,6,7,8-HpCDD-13C	2.0	63
1,2,3,6,7,8-HxCDF	1.0	1.0	101	OCDD-13C	4.0	55
2,3,4,6,7,8-HxCDF	1.0	0.98	98			
1,2,3,7,8,9-HxCDF	1.0	1.00	100	1,2,3,4-TCDD-13C	2.0	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.0	NA
1,2,3,4,7,8-HxCDD	1.0	1.1	111	2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	1.0	1.1	114			
1,2,3,7,8,9-HxCDD	1.0	0.99	99			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.0	1.1	107			
1,2,3,4,7,8,9-HpCDF	1.0	1.1	108			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.0	1.0	104			
Total HpCDD						
OCDF	2.0	2.3	116			
OCDD	2.0	2.3	115			

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCS-83375		
Filename	F201023B_03	Matrix	Solid
Total Amount Extracted	10.4 g	Dilution	NA
ICAL ID	F200714	Extracted	10/21/2020 17:24
CCal Filename(s)	F201023B_01 & F201023B_18	Analyzed	10/23/2020 22:54
Method Blank ID	BLANK-83374	Injected By	BAL

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDF	0.20	0.21	106	2,3,7,8-TCDF-13C	2.0	64
Total TCDF				2,3,7,8-TCDD-13C	2.0	57
				1,2,3,7,8-PeCDF-13C	2.0	84
2,3,7,8-TCDD	0.20	0.22	112	2,3,4,7,8-PeCDF-13C	2.0	87
Total TCDD				1,2,3,7,8-PeCDD-13C	2.0	89
				1,2,3,4,7,8-HxCDF-13C	2.0	77
1,2,3,7,8-PeCDF	1.0	0.98	98	1,2,3,6,7,8-HxCDF-13C	2.0	81
2,3,4,7,8-PeCDF	1.0	0.98	98	2,3,4,6,7,8-HxCDF-13C	2.0	79
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.0	71
				1,2,3,4,7,8-HxCDD-13C	2.0	81
1,2,3,7,8-PeCDD	1.0	0.97	97	1,2,3,6,7,8-HxCDD-13C	2.0	69
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.0	66
				1,2,3,4,7,8,9-HpCDF-13C	2.0	69
1,2,3,4,7,8-HxCDF	1.0	1.0	102	1,2,3,4,6,7,8-HpCDD-13C	2.0	69
1,2,3,6,7,8-HxCDF	1.0	0.97	97	OCDD-13C	4.0	54
2,3,4,6,7,8-HxCDF	1.0	0.99	99			
1,2,3,7,8,9-HxCDF	1.0	0.98	98	1,2,3,4-TCDD-13C	2.0	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.0	NA
1,2,3,4,7,8-HxCDD	1.0	0.95	95	2,3,7,8-TCDD-37Cl4	0.20	60
1,2,3,6,7,8-HxCDD	1.0	1.2	124			
1,2,3,7,8,9-HxCDD	1.0	0.99	99			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.0	1.0	103			
1,2,3,4,7,8,9-HpCDF	1.0	0.99	99			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.0	1.0	100			
Total HpCDD						
OCDF	2.0	2.1	103			
OCDD	2.0	2.2	111			

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

November 12, 2020

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on October 30, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Lynch
colin.lynch@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Pace Analytical Services - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Massachusetts DWP Certification #: via MN 027-053-137
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10537505001	**SW27-MW01**	Water	10/28/20 16:55	10/30/20 12:50
10537505002	**SW27-MW02**	Water	10/29/20 12:15	10/30/20 12:50
10537505003	**SW27-MW03**	Water	10/29/20 15:45	10/30/20 12:50
10537505004	**SW27-MW04**	Water	10/30/20 11:35	10/30/20 12:50
10537505005	**SW27-MW05**	Water	10/29/20 09:35	10/30/20 12:50
10537505006	**SW27-MW06**	Water	10/28/20 11:38	10/30/20 12:50
10537505007	**SW27-MW07**	Water	10/28/20 14:39	10/30/20 12:50
10537505008	**SW27-MW08**	Water	10/30/20 09:25	10/30/20 12:50
10537505009	**SW27-MW02-D**	Water	10/29/20 12:45	10/30/20 12:50
10537505010	**SW27-EB01**	Water	10/29/20 13:15	10/30/20 12:50

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10537505001	**SW27-MW01**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505002	**SW27-MW02**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505003	**SW27-MW03**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505004	**SW27-MW04**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505005	**SW27-MW05**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505006	**SW27-MW06**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505007	**SW27-MW07**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505008	**SW27-MW08**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505009	**SW27-MW02-D**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
10537505010	**SW27-EB01**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2

PASI-M = Pace Analytical Services - Minneapolis

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Method: **WI MOD DRO**
Description: WIDRO LV GCS Silica Gel
Client: Bay West LLC
Date: November 12, 2020

General Information:
10 samples were analyzed for WI MOD DRO by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Method: **EPA 8270E by SIM**
Description: 8270E MSSV 14 Dioxane By SIM
Client: Bay West LLC
Date: November 12, 2020

General Information:
10 samples were analyzed for EPA 8270E by SIM by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA Mod. 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 708185

S0: Surrogate recovery outside laboratory control limits.

- LCSD (Lab ID: 3783616)
  - 1,4-Dioxane-d8 (S)
- SW27-MW03 (Lab ID: 10537505003)
  - 1,4-Dioxane-d8 (S)
- SW27-MW05 (Lab ID: 10537505005)
  - 1,4-Dioxane-d8 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Method: **EPA 8270E by SIM**
Description: 8270E MSSV 14 Dioxane By SIM
Client: Bay West LLC
Date: November 12, 2020

Analyte Comments:

QC Batch: 708185

3M: Reanalysis conducted within EPA method holding time. Results do not confirm original analysis.

- SW27-MW03 (Lab ID: 10537505003)
  - 1,4-Dioxane-d8 (S)
- SW27-MW05 (Lab ID: 10537505005)
  - 1,4-Dioxane-d8 (S)

QC Batch: 709186

1M: Extraction or preparation was conducted outside of the recognized method holding time. Results confirm original analysis performed in hold time.

- SW27-MW01 (Lab ID: 10537505001)
  - 1,4-Dioxane (SIM)

2M: Extraction or preparation was conducted outside of the recognized method holding time. Results do not confirm original analysis performed in hold time.

- SW27-MW06 (Lab ID: 10537505006)
  - 1,4-Dioxane (SIM)
- SW27-MW07 (Lab ID: 10537505007)
  - 1,4-Dioxane (SIM)

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW01 **Lab ID: 10537505001** Collected: 10/28/20 16:55 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.11**	mg/L	0.11	0.037	1	11/02/20 14:48	11/03/20 15:28		
Surrogates									
n-Triacontane (S)	80	%.	42-125		1	11/02/20 14:48	11/03/20 15:28	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.16J**	ug/L	0.24	0.10	1	11/05/20 18:45	11/09/20 22:37	123-91-1	1M
Surrogates									
1,4-Dioxane-d8 (S)	30	%.	30-125		1	11/05/20 18:45	11/09/20 22:37		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW02 **Lab ID: 10537505002** Collected: 10/29/20 12:15 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.11**	mg/L	0.11	0.039	1	11/02/20 14:48	11/03/20 15:35		
Surrogates									
n-Triacontane (S)	78	%.	42-125		1	11/02/20 14:48	11/03/20 15:35	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	11/05/20 18:45	11/08/20 23:35	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	32	%.	30-125		1	11/05/20 18:45	11/08/20 23:35		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW03 **Lab ID: 10537505003** Collected: 10/29/20 15:45 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**0.052J**	mg/L	0.10	0.036	1	11/02/20 14:48	11/03/20 15:42		
Surrogates									
n-Triacontane (S)	80	%.	42-125		1	11/02/20 14:48	11/03/20 15:42	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.15J**	ug/L	0.25	0.11	1	11/02/20 17:19	11/04/20 07:09	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	27	%.	30-125		1	11/02/20 17:19	11/04/20 07:09		3M,S0

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW04 **Lab ID: 10537505004** Collected: 10/30/20 11:35 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.12**	mg/L	0.12	0.041	1	11/02/20 14:48	11/03/20 15:49		
Surrogates									
n-Triacontane (S)	49	%.	42-125		1	11/02/20 14:48	11/03/20 15:49	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.23**	ug/L	0.23	0.097	1	11/05/20 18:45	11/09/20 01:19	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	32	%.	30-125		1	11/05/20 18:45	11/09/20 01:19		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW05 **Lab ID: 10537505005** Collected: 10/29/20 09:35 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.034	1	11/02/20 14:48	11/03/20 15:56		
Surrogates									
n-Triacontane (S)	79	%.	42-125		1	11/02/20 14:48	11/03/20 15:56	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.33**	ug/L	0.25	0.11	1	11/02/20 17:19	11/04/20 07:30	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	28	%.	30-125		1	11/02/20 17:19	11/04/20 07:30		3M,S0

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW06 **Lab ID: 10537505006** Collected: 10/28/20 11:38 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**0.11**	mg/L	0.11	0.037	1	11/02/20 14:48	11/03/20 16:04		
Surrogates									
n-Triacontane (S)	84	%.	42-125		1	11/02/20 14:48	11/03/20 16:04	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.17J**	ug/L	0.24	0.10	1	11/05/20 18:45	11/09/20 04:25	123-91-1	2M
Surrogates									
1,4-Dioxane-d8 (S)	30	%.	30-125		1	11/05/20 18:45	11/09/20 04:25		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW07 **Lab ID: 10537505007** Collected: 10/28/20 14:39 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.11**	mg/L	0.11	0.037	1	11/02/20 14:48	11/03/20 16:11		
Surrogates									
n-Triacontane (S)	76	%.	42-125		1	11/02/20 14:48	11/03/20 16:11	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.26**	ug/L	0.26	0.11	1	11/05/20 18:45	11/09/20 04:46	123-91-1	2M
Surrogates									
1,4-Dioxane-d8 (S)	30	%.	30-125		1	11/05/20 18:45	11/09/20 04:46		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW08 **Lab ID: 10537505008** Collected: 10/30/20 09:25 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.034	1	11/02/20 14:48	11/03/20 16:18		
Surrogates									
n-Triacontane (S)	70	%.	42-125		1	11/02/20 14:48	11/03/20 16:18	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.27**	ug/L	0.24	0.10	1	11/05/20 18:45	11/09/20 01:39	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	37	%.	30-125		1	11/05/20 18:45	11/09/20 01:39		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-MW02-D **Lab ID: 10537505009** Collected: 10/29/20 12:45 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.12**	mg/L	0.12	0.041	1	11/02/20 14:48	11/03/20 16:25		
Surrogates									
n-Triacontane (S)	86	%.	42-125		1	11/02/20 14:48	11/03/20 16:25	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.24**	ug/L	0.24	0.10	1	11/05/20 18:45	11/09/20 00:37	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	40	%.	30-125		1	11/05/20 18:45	11/09/20 00:37		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Sample: SW27-EB01 **Lab ID: 10537505010** Collected: 10/29/20 13:15 Received: 10/30/20 12:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.12**	mg/L	0.12	0.041	1	11/02/20 14:48	11/03/20 16:33		
Surrogates									
n-Triacontane (S)	87	%.	42-125		1	11/02/20 14:48	11/03/20 16:33	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.39**	ug/L	0.24	0.10	1	11/05/20 18:45	11/09/20 00:58	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	30	%.	30-125		1	11/05/20 18:45	11/09/20 00:58		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

QC Batch: 708185
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E Water 14 Dioxane by SIM
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10537505003, 10537505005

METHOD BLANK: 3783614 Matrix: Water
Associated Lab Samples: 10537505003, 10537505005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (SIM)	ug/L	<0.25	0.25	0.11	11/04/20 01:57	
1,4-Dioxane-d8 (S)	%.	38	30-125		11/04/20 01:57	

LABORATORY CONTROL SAMPLE & LCSD: 3783615 3783616

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (SIM)	ug/L	10	10.7	11.5	107	115	32-128	7	20	
1,4-Dioxane-d8 (S)	%.				31	29	30-125			S0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

QC Batch: 709186
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E Water 14 Dioxane by SIM
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10537505001, 10537505002, 10537505004, 10537505006, 10537505007, 10537505008, 10537505009, 10537505010

METHOD BLANK: 3788573 Matrix: Water
Associated Lab Samples: 10537505001, 10537505002, 10537505004, 10537505006, 10537505007, 10537505008, 10537505009, 10537505010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (SIM)	ug/L	<0.25	0.25	0.11	11/08/20 21:51	
1,4-Dioxane-d8 (S)	%.	30	30-125		11/08/20 21:51	

LABORATORY CONTROL SAMPLE & LCSD: 3788574 3788575

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (SIM)	ug/L	10	8.8	10.1	88	101	32-128	13	20	
1,4-Dioxane-d8 (S)	%.				37	31	30-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

QC Batch: 708182 | Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO | Analysis Description: WIDRO Low Volume GCS w/Cleanup
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10537505001, 10537505002, 10537505003, 10537505004, 10537505005, 10537505006, 10537505007, 10537505008, 10537505009, 10537505010

METHOD BLANK: 3783599 Matrix: Water
Associated Lab Samples: 10537505001, 10537505002, 10537505003, 10537505004, 10537505005, 10537505006, 10537505007, 10537505008, 10537505009, 10537505010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	<0.10	0.10	0.034	11/03/20 15:13	
n-Triacontane (S)	%.	91	42-125		11/03/20 15:13	

LABORATORY CONTROL SAMPLE & LCSD: 3783600 3783601

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	0.8	0.57	0.63	72	79	54-125	10	20	
n-Triacontane (S)	%.				84	86	42-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1M	Extraction or preparation was conducted outside of the recognized method holding time. Results confirm original analysis performed in hold time.
2M	Extraction or preparation was conducted outside of the recognized method holding time. Results do not confirm original analysis performed in hold time.
3M	Reanalysis conducted within EPA method holding time. Results do not confirm original analysis.
S0	Surrogate recovery outside laboratory control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10537505

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10537505001	**SW27-MW01**	WI MOD DRO	708182	WI MOD DRO	708666
10537505002	**SW27-MW02**	WI MOD DRO	708182	WI MOD DRO	708666
10537505003	**SW27-MW03**	WI MOD DRO	708182	WI MOD DRO	708666
10537505004	**SW27-MW04**	WI MOD DRO	708182	WI MOD DRO	708666
10537505005	**SW27-MW05**	WI MOD DRO	708182	WI MOD DRO	708666
10537505006	**SW27-MW06**	WI MOD DRO	708182	WI MOD DRO	708666
10537505007	**SW27-MW07**	WI MOD DRO	708182	WI MOD DRO	708666
10537505008	**SW27-MW08**	WI MOD DRO	708182	WI MOD DRO	708666
10537505009	**SW27-MW02-D**	WI MOD DRO	708182	WI MOD DRO	708666
10537505010	**SW27-EB01**	WI MOD DRO	708182	WI MOD DRO	708666
10537505001	**SW27-MW01**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571
10537505002	**SW27-MW02**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571
10537505003	**SW27-MW03**	EPA Mod. 3510C	708185	EPA 8270E by SIM	708625
10537505004	**SW27-MW04**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571
10537505005	**SW27-MW05**	EPA Mod. 3510C	708185	EPA 8270E by SIM	708625
10537505006	**SW27-MW06**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571
10537505007	**SW27-MW07**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571
10537505008	**SW27-MW08**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571
10537505009	**SW27-MW02-D**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571
10537505010	**SW27-EB01**	EPA Mod. 3510C	709186	EPA 8270E by SIM	709571

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A (Required Client Information:)		Section B (Required Project Information:)		Section C (Invoice Information:)		Section D (Laboratory Information)		Section E (MPCA Information)	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Numbe	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:	tharsch@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

Preservatives: HCl

WO# : 10537505

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground	10/28/20	1655	8	X	X	X	X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	10/29/20	1215		X	X	X	X	002
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	10/29/20	1545		X	X	X	X	003
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	10/30/20	1135		X	X	X	X	004
5	854577	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	10/29/20	0935		X	X	X	X	005
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	10/28/20	1138		X	X	X	X	006
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	10/28/20	1439		X	X	X	X	007
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	10/30/20	0925		X	X	X	X	008
9	847410	SW27-MW02-D	QC-FR	G	WG	NW	Wtr-Ground	10/29/20	1245		X	X	X	X	004
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	10/29/20	1315		X	X	X	X	010
11															
12															TN 103020

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		10/30/20	1250	TN Pace	103020	1250	~~0.6~~ ~~5.5~~ ~~5.6~~ ~~NOT~~

Temp (°C) | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ZACH MASON

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 10/30/20

Temp : 1.0, 4.3, 4.8, 3.9, 3.2

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10537505

PM: CL1 Due Date: 11/13/20

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☑Yes ☐No

Thermometer: ☑T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☐T5(0489) **Type of Ice:** ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No **Were All Container Temps Taken?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:**_____ °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: True **Cooler Temp Corrected w/temp blank:** 1.0, 4.3, 4.8, 3.9, 3.2 °C

USDA Regulated Soil: (☑ N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☑No

Date/Initials of Person Examining Contents: 10 30 20 TN

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☑No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑Yes	☐No		1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☑Yes ☑Yes	☐No ☐No		8.
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑Water ☐Soil ☐Oil ☐Other_____	☑Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
All containers needing acid/base preservation have been checked? CL1 11/3/20	~~☑Yes~~	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	~~☑Yes~~	☐No	☒N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	
Trip Blank Present?	☐Yes	☐No	☑N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

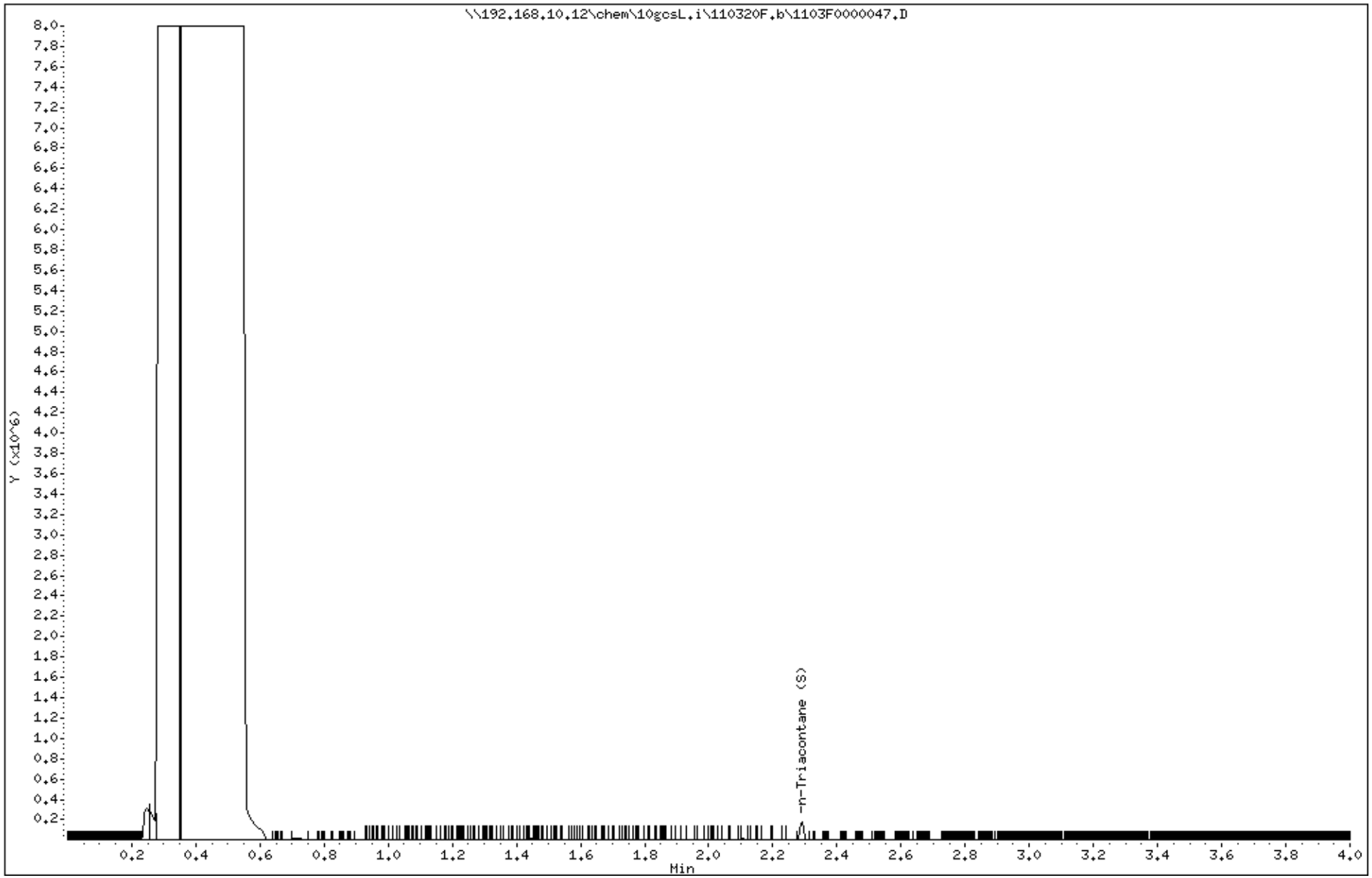
Project Manager Review: Carl Lynch **Date:** 11/3/20

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: TN

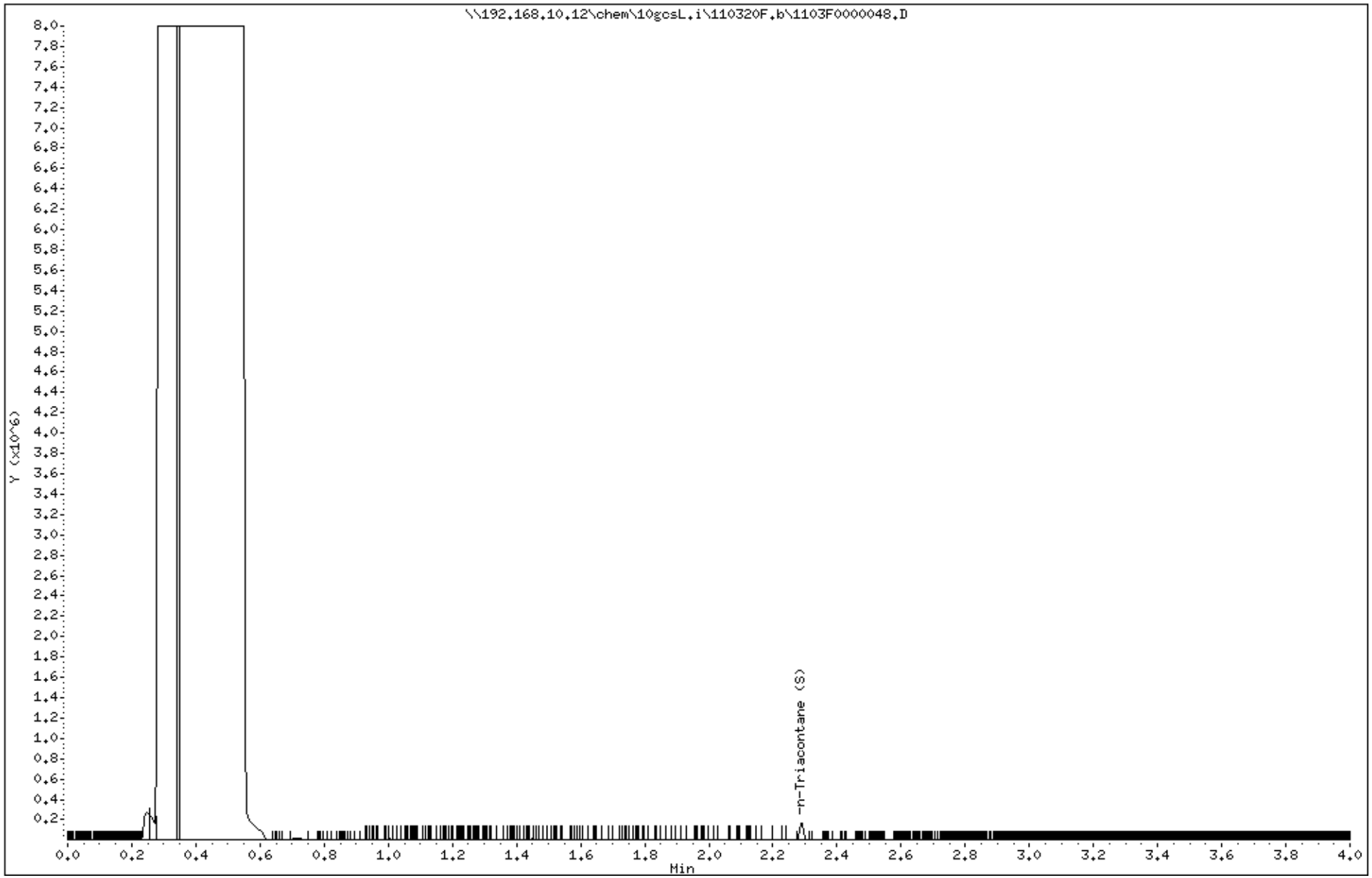
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000047.D
Date : 03-NOV-2020 15:28
Client ID: SW27-MW01
Sample Info: 10537505001
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



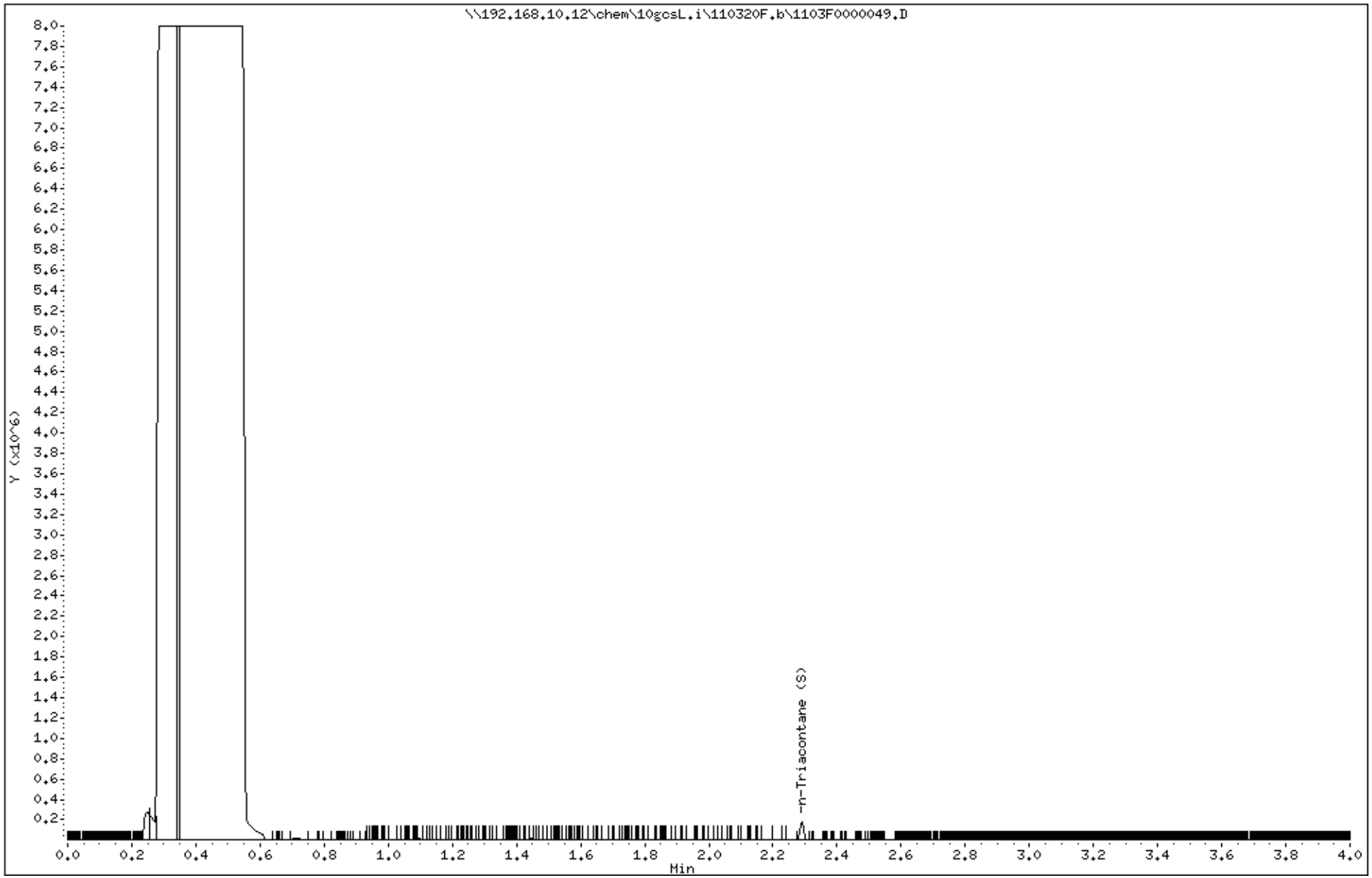
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000048.D
Date : 03-NOV-2020 15:35
Client ID: SW27-MW02
Sample Info: 10537505002
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



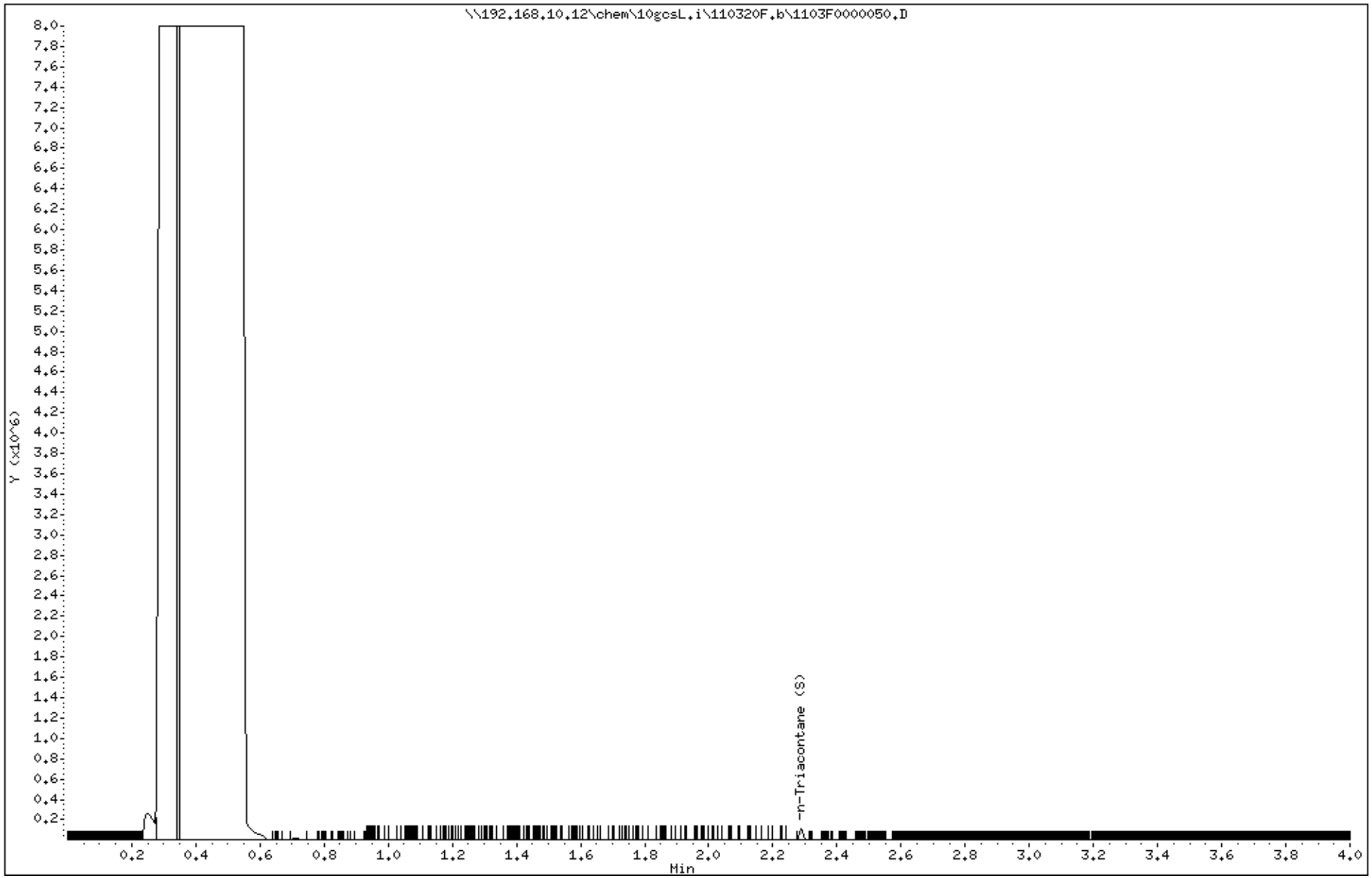
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000049.D
Date : 03-NOV-2020 15:42
Client ID: SW27-MW03
Sample Info: 10537505003
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



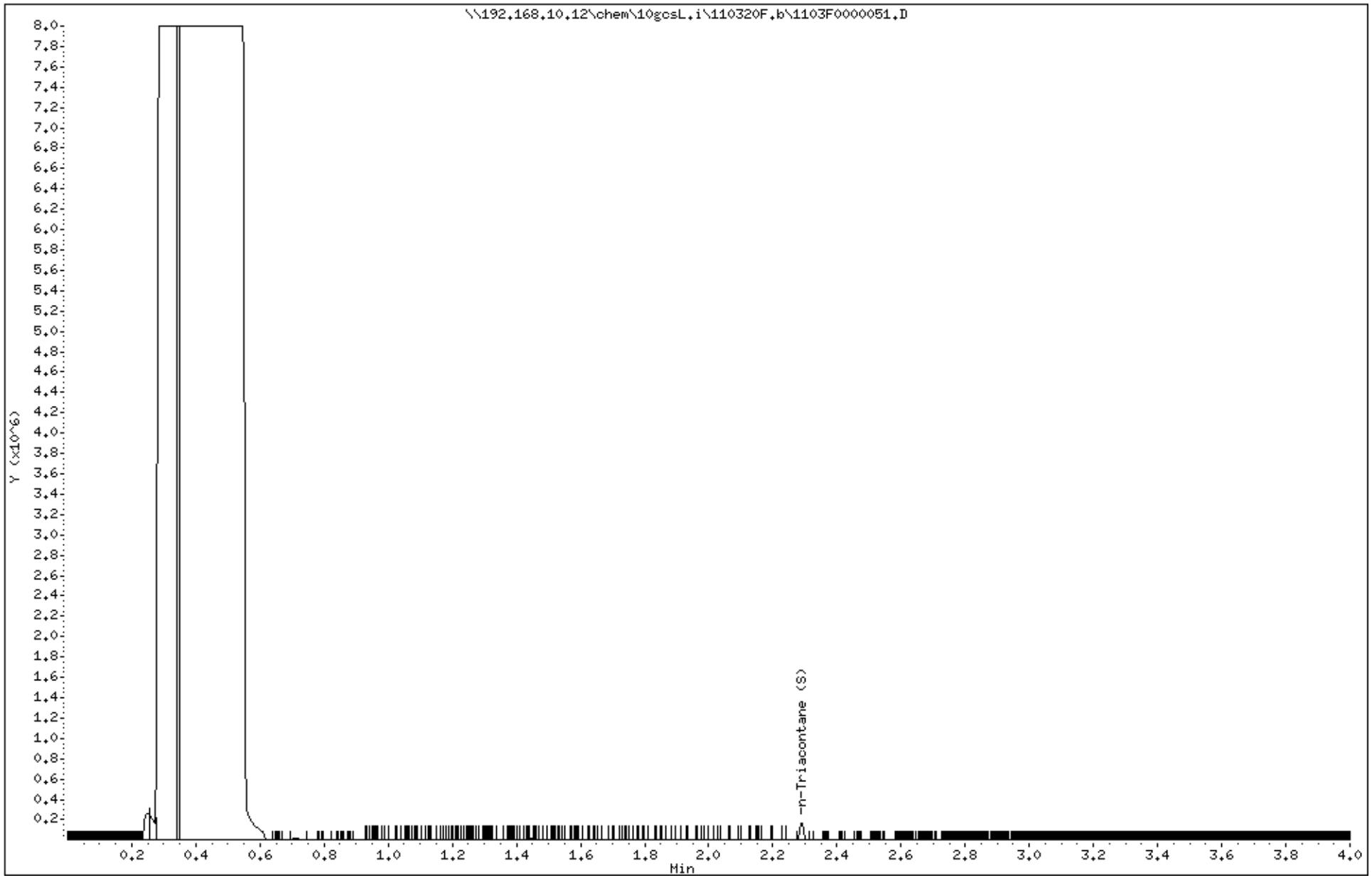
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000050.D
Date : 03-NOV-2020 15:49
Client ID: SW27-MW04
Sample Info: 10537505004
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



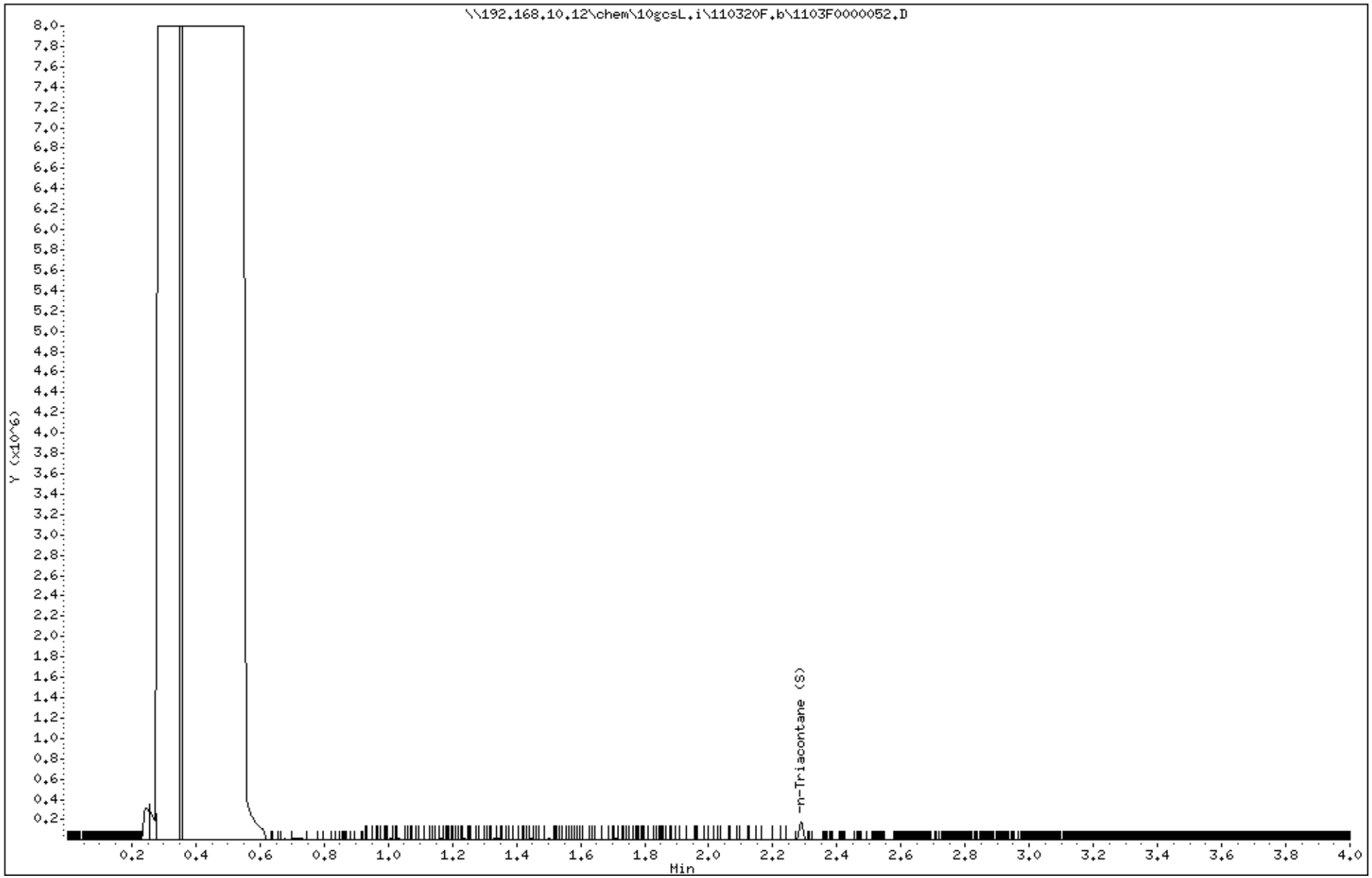
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000051.D
Date : 03-NOV-2020 15:56
Client ID: SW27-MW05
Sample Info: 10537505005
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



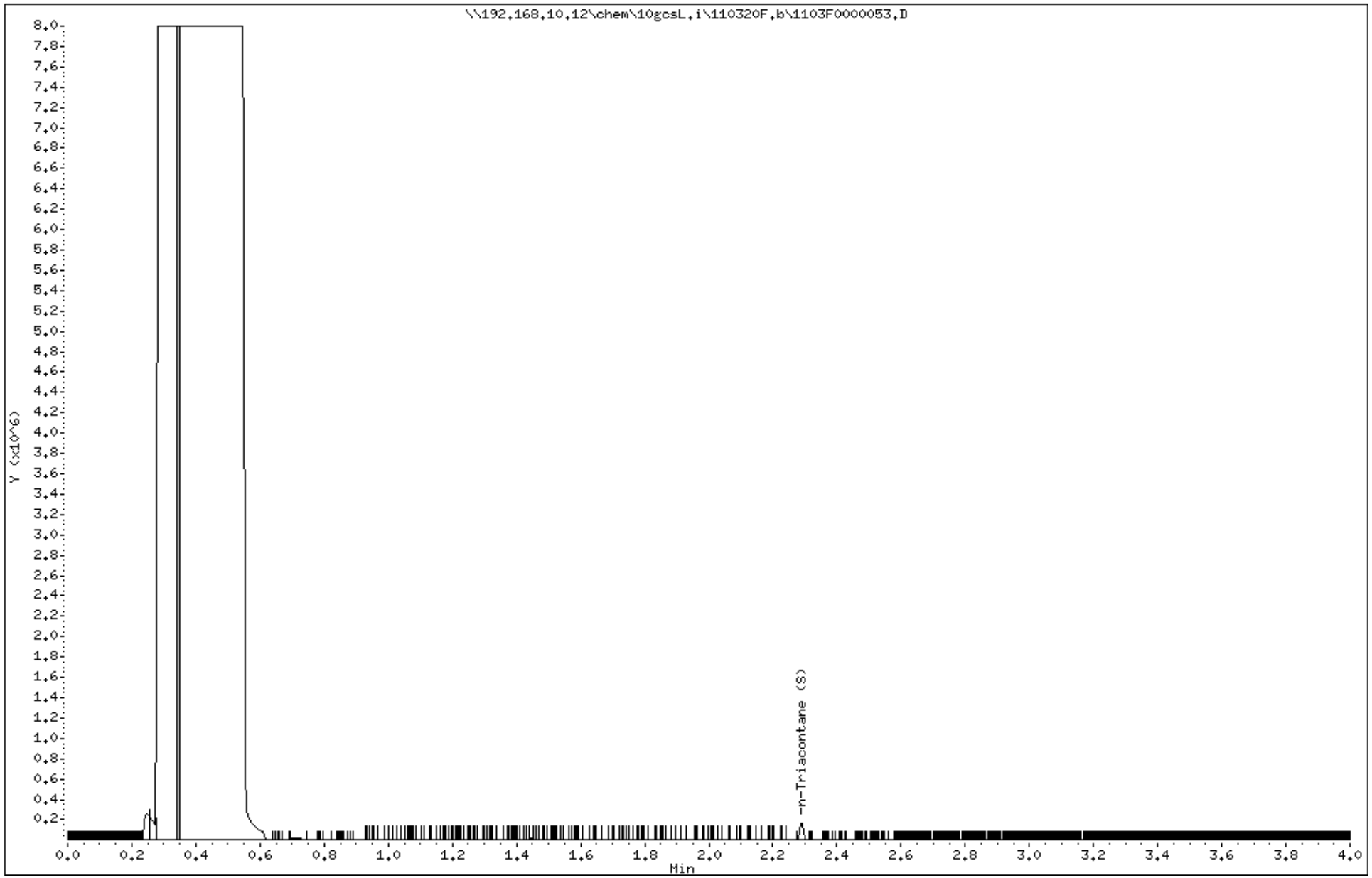
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000052.D
Date : 03-NOV-2020 16:04
Client ID: SW27-MW06
Sample Info: 10537505006
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



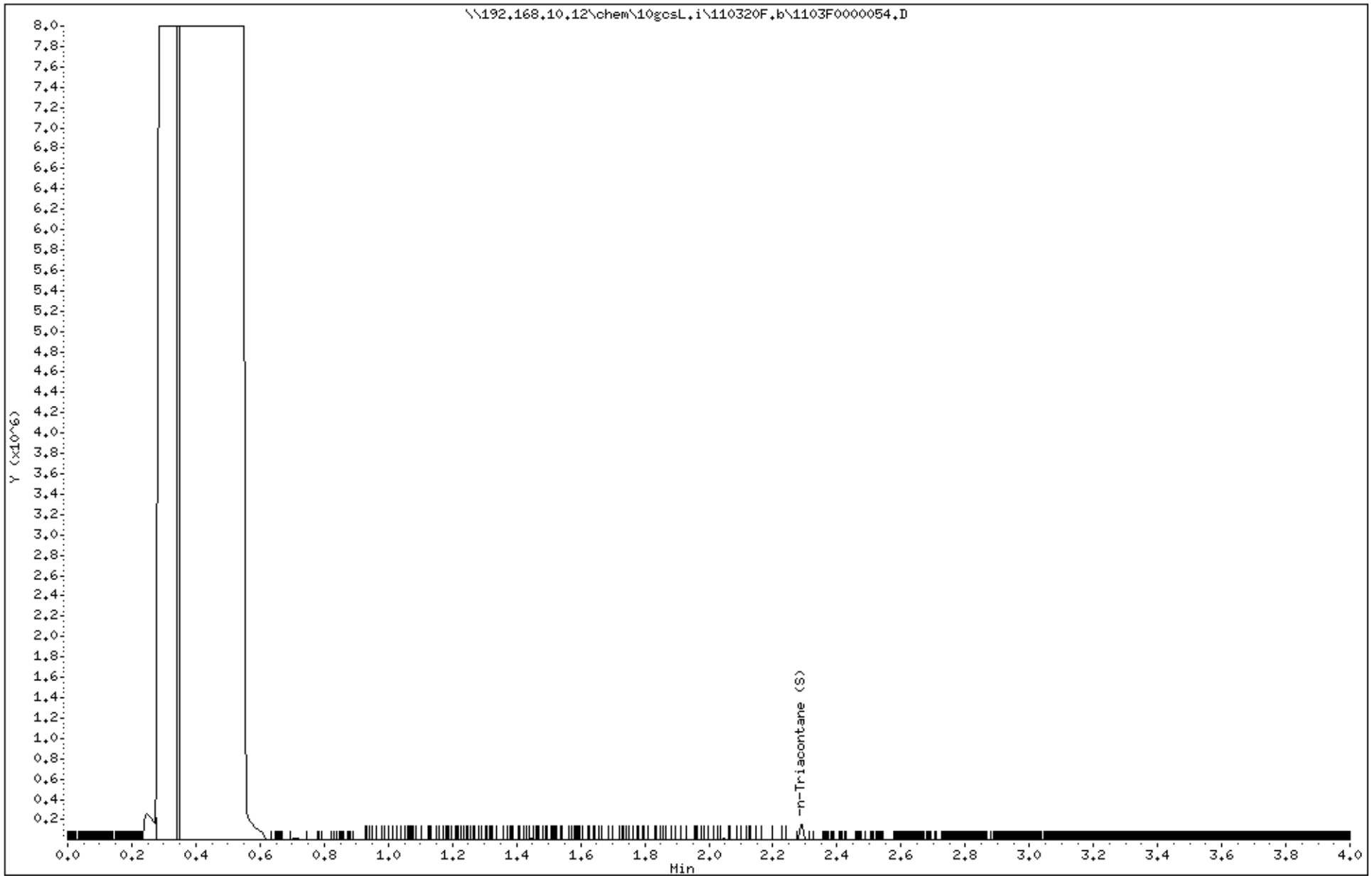
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000053.D
Date : 03-NOV-2020 16:11
Client ID: SW27-MW07
Sample Info: 10537505007
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



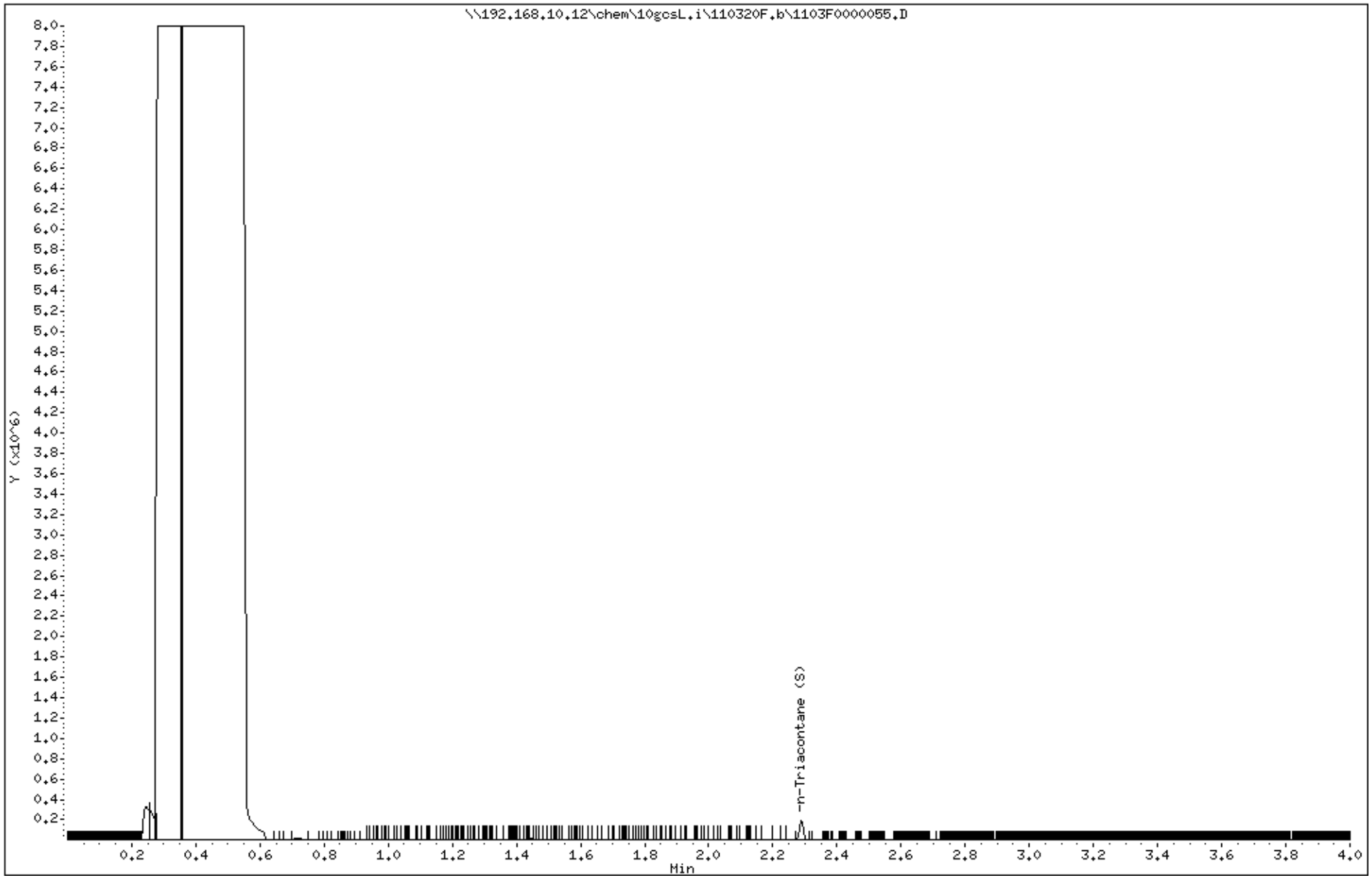
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000054.D
Date : 03-NOV-2020 16:18
Client ID: SW27-MW08
Sample Info: 10537505008
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



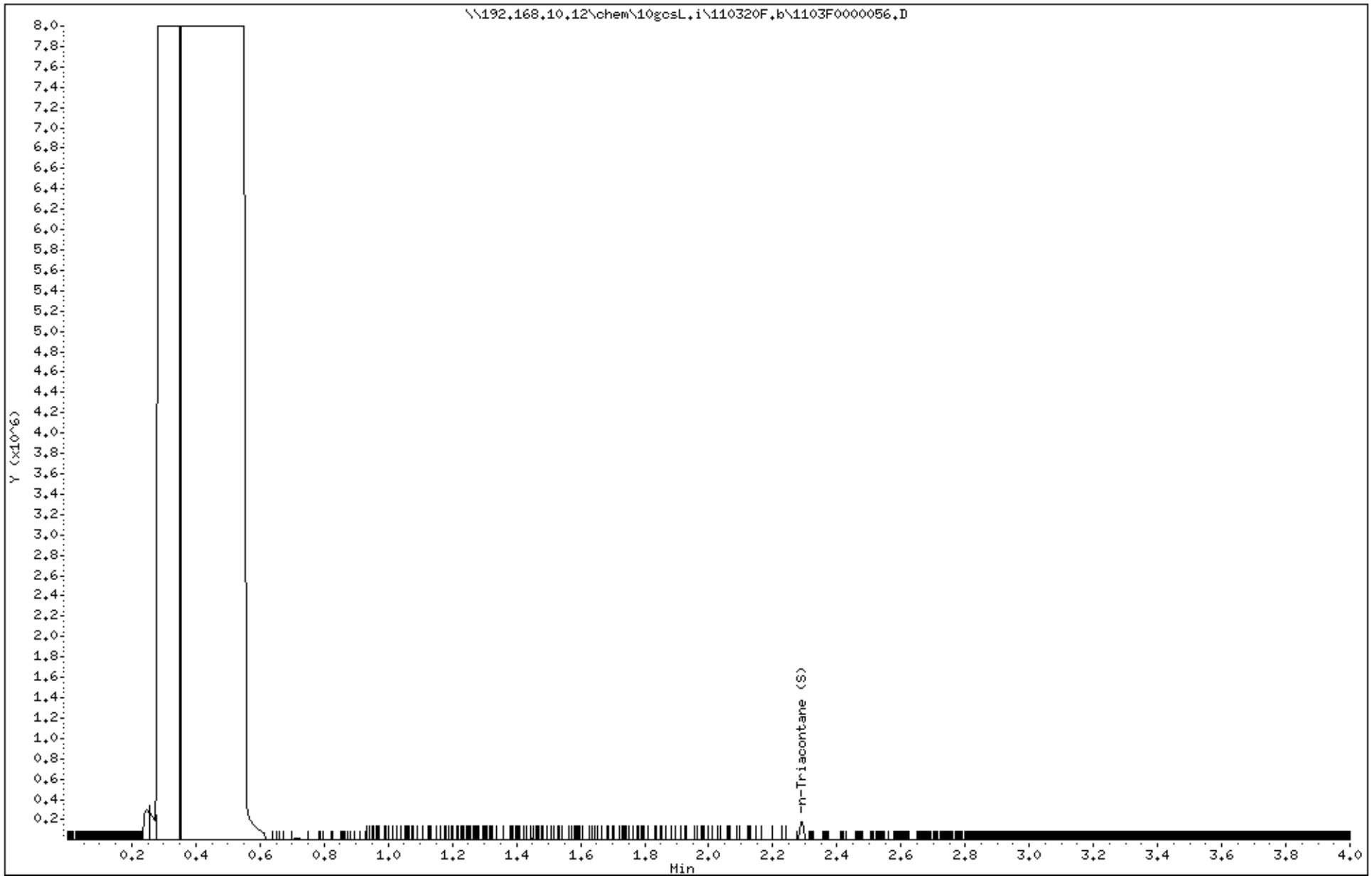
Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000055.D
Date : 03-NOV-2020 16:25
Client ID: SW27-MW02-D
Sample Info: 10537505009
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcsL.i\110320F.b\1103F0000056.D
Date : 03-NOV-2020 16:33
Client ID: SW27-EB01
Sample Info: 10537505010
Volume Injected (uL): 1.0
Column phase: DB-5-US20120014

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PFAAs

Report Information:

Pace Project #: 10537507
Sample Receipt Date: 10/30/2020
Client Project #: 200402 SW#27 Vadnais Heights
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Kirsten Hogberg, your Pace Project Manager.

This report has been reviewed by:

November 16, 2020

Kirsten Hogberg, Project Manager
(612) 607-6407
(612) 607-6444 (fax)
kirsten.hogberg@pacelabs.com

Report Prepared Date:
November 12, 2020

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

DISCUSSION

This report presents the results from the analyses performed on ten samples, one matrix spike, and a matrix spike duplicate submitted by a representative of Bay West LLC. The samples were analyzed for seven perfluorinated compounds using MPCA PFC Guidance. Reporting limits were set to the quantitation limits.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank was free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

A laboratory spike sample was also prepared with the sample batch using clean reference matrix that had been fortified with native standards. The recovery results were within the method limits.

Matrix spikes were prepared with the sample batch using sample material that had been fortified with native standards. The recovery results were within the method limits. With the exception of PFOS and PFHxS, the RPDs (relative percent differences) between one designated spike and its duplicate were within the method limits. These deviations may be due to the presence of the affected analytes in the sample material and/or sample inhomogeneity.

The recoveries of the isotopically-labeled surrogate standards in the sample extracts were within the target ranges specified in the method.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Mississippi	MN00064
A2LA	2926.01	Missouri	10100
Alabama	40770	Montana	CERT0092
Alaska-DW	MN00064	Nebraska	NE-OS-18-06
Alaska-UST	17-009	Nevada	MN00064
Arizona	AZ0014	New Hampshire	2081
Arkansas - WW	88-0680	New Jersey	MN002
Arkansas-DW	MN00064	New York	11647
California	2929	North Carolina-	27700
Colorado	MN00064	North Carolina-	530
Connecticut	PH-0256	North Dakota	R-036
Florida	E87605	Ohio - VAP	CL101
Georgia	959	Ohio-DW	41244
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Massachusetts-	via MN 027-053	West Virginia-D	382
Michigan	9909	West Virginia-D	9952C
Minnesota	027-053-137	Wisconsin	999407970
Minnesota-Ag	via MN 027-053	Wyoming-UST	via A2LA 2926.
Minnesota-Petr	1240		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Report No.: 10537507 MPCA_ORDER

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information		Section E — MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Number	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:	tharsch@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
SQC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
AQ=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
SS=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

Preservatives: HCl

WO# : 10537507

10537507

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground	10/28/20	1655	8	X	X	X	X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	10/29/20	1215		X	X	X	X	002
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	10/29/20	1545		X	X	X	X	003
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	10/30/20	1135		X	X	X	X	004
5	854577	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	10/29/20	0935		X	X	X	X	005
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	10/28/20	1138		X	X	X	X	006
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	10/28/20	1439		X	X	X	X	007
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	10/30/20	0925		X	X	X	X	008
9	847410	SW27-MW02-D	QC-FR	G	WG	NW	Wtr-Ground	10/29/20	1245		X	X	X	X	009
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	10/29/20	1315		X	X	X	X	010
11															
12															TN 103020

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		10/30/20	1250	TN Pace	103020	1250	~~0.6~~ 5.5 5.5 ~~NO~~

SAMPLER NAME AND SIGNATURE			Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	ZACH MASON					
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY): 10/30/20				

Temp : 1.0, 4.3, 4.8, 3.9, 3.2

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: WO#: 10537507
PM: KNH Due Date: 11/13/20
CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☒Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☒T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☐T5(0489) **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** _____ °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: True **Cooler Temp Corrected w/temp blank:** 1.0, 4.3, 4.8, 3.9, 3.2 °C

USDA Regulated Soil: (☒ N/A, water sample/Other:_____)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☒No

Date/Initials of Person Examining Contents: 10 30 20 TN
Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☒No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		8.
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒Water ☐Soil ☐Oil ☐Other_____	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☒Yes	☐No	☒N/A	12. Sample # ☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☒Yes	☐No	☒N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒Yes	☐No	☒N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

Metals

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Kirsten Hoffberg **Date:** 11/2/2020

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs

Sample Analysis Summary

Client's Sample ID	SM27-MW01	Date Extracted	11/05/2020
Lab Sample ID	10537507001	Total Amount Extracted	102 mL
Filename	W201106B_011	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_003
Collected	10/28/2020	Ending CCal	W201106B_015
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	30	4.9	0.92	1	11/06/202011:00	375-22-4	
PFPeA	11	4.9	1.3	1	11/06/202011:00	2706-90-3	
PFBS	6.7	4.3	1.0	1	11/06/202011:00	375-73-5	
PFHxA	15	4.9	1.1	1	11/06/202011:00	307-24-4	
PFHxS	100	4.6	0.83	1	11/06/202011:00	355-46-4	
PFOA	21	4.9	1.1	1	11/06/202011:00	335-67-1	
PFOS	93	4.7	0.79	1	11/06/202011:00	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	92	50 - 150	Pass
13C2_PFDA	2.0	1.5	77	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	726662	328468 - 985403	448859 - 897718	Pass
13C4_PFOS	1594309	700718 - 2102153	975648 - 1951296	Pass
d3-MeFOSAA	889759	373820 - 1121461	531559 - 1063118	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

Client's Sample ID	SM27-MW02	Date Extracted	11/05/2020
Lab Sample ID	10537507002	Total Amount Extracted	104 mL
Filename	W201106B_012	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_003
Collected	10/29/2020	Ending CCal	W201106B_015
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	88	4.8	0.91	1	11/06/202011:08	375-22-4	
PFPeA	12	4.8	1.3	1	11/06/202011:08	2706-90-3	
PFBS	ND	4.2	1.0	1	11/06/202011:08	375-73-5	
PFHxA	8.1	4.8	1.1	1	11/06/202011:08	307-24-4	
PFHxS	ND	4.5	0.82	1	11/06/202011:08	355-46-4	
PFOA	12	4.8	1.1	1	11/06/202011:08	335-67-1	
PFOS	ND	4.6	0.78	1	11/06/202011:08	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	88	50 - 150	Pass
13C2_PFDA	2.0	1.5	76	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	715759	328468 - 985403	448859 - 897718	Pass
13C4_PFOS	1567938	700718 - 2102153	975648 - 1951296	Pass
d3-MeFOSAA	850780	373820 - 1121461	531559 - 1063118	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs

Sample Analysis Summary

Client's Sample ID	SM27-MW03	Date Extracted	11/05/2020
Lab Sample ID	10537507003	Total Amount Extracted	102 mL
Filename	W201106B_013	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_003
Collected	10/29/2020	Ending CCal	W201106B_015
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	43	4.9	0.92	1	11/06/202011:16	375-22-4	
PFPeA	13	4.9	1.3	1	11/06/202011:16	2706-90-3	
PFBS	22	4.3	1.0	1	11/06/202011:16	375-73-5	
PFHxA	49	4.9	1.1	1	11/06/202011:16	307-24-4	
PFHxS	86	4.6	0.83	1	11/06/202011:16	355-46-4	
PFOA	67	4.9	1.1	1	11/06/202011:16	335-67-1	
PFOS	ND	4.7	0.79	1	11/06/202011:16	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.7	87	50 - 150	Pass
13C2_PFDA	2.0	1.8	92	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	708929	328468 - 985403	448859 - 897718	Pass
13C4_PFOS	1568947	700718 - 2102153	975648 - 1951296	Pass
d3-MeFOSAA	915908	373820 - 1121461	531559 - 1063118	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs

Sample Analysis Summary

Client's Sample ID	SM27-MW04	Date Extracted	11/05/2020
Lab Sample ID	10537507004	Total Amount Extracted	26.1 mL
Filename	W201106B_014	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_003
Collected	10/30/2020	Ending CCal	W201106B_015
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	19	3.6	1	11/06/202011:25	375-22-4	
PFPeA	ND	19	5.2	1	11/06/202011:25	2706-90-3	
PFBS	ND	17	4.1	1	11/06/202011:25	375-73-5	
PFHxA	ND	19	4.2	1	11/06/202011:25	307-24-4	
PFHxS	ND	18	3.2	1	11/06/202011:25	355-46-4	
PFOA	ND	19	4.5	1	11/06/202011:25	335-67-1	
PFOS	21	18	3.1	1	11/06/202011:25	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	2.0	100	50 - 150	Pass
13C2_PFDA	2.0	1.7	87	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	645659	328468 - 985403	448859 - 897718	Pass
13C4_PFOS	1399970	700718 - 2102153	975648 - 1951296	Pass
d3-MeFOSAA	767203	373820 - 1121461	531559 - 1063118	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs

Sample Analysis Summary

Client's Sample ID	SM27-MW05	Date Extracted	11/05/2020
Lab Sample ID	10537507005	Total Amount Extracted	101 mL
Filename	W201106B_016	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_015
Collected	10/29/2020	Ending CCal	W201106B_023
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	76	5.0	0.93	1	11/06/202011:42	375-22-4	
PFPeA	ND	5.0	1.3	1	11/06/202011:42	2706-90-3	
PFBS	ND	4.4	1.1	1	11/06/202011:42	375-73-5	
PFHxA	ND	5.0	1.1	1	11/06/202011:42	307-24-4	
PFHxS	ND	4.7	0.84	1	11/06/202011:42	355-46-4	
PFOA	ND	5.0	1.2	1	11/06/202011:42	335-67-1	
PFOS	ND	4.8	0.80	1	11/06/202011:42	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	92	50 - 150	Pass
13C2_PFDA	2.0	1.7	87	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	689000	328468 - 985403	458515 - 917030	Pass
13C4_PFOS	1496735	700718 - 2102153	1015246 - 2030493	Pass
d3-MeFOSAA	814468	373820 - 1121461	554807 - 1109614	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

Client's Sample ID	SM27-MW06	Date Extracted	11/05/2020
Lab Sample ID	10537507006	Total Amount Extracted	106 mL
Filename	W201106B_017	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_015
Collected	10/28/2020	Ending CCal	W201106B_023
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	75	4.7	0.88	1	11/06/202011:50	375-22-4	
PFPeA	11	4.7	1.3	1	11/06/202011:50	2706-90-3	
PFBS	ND	4.1	1.0	1	11/06/202011:50	375-73-5	
PFHxA	8.8	4.7	1.0	1	11/06/202011:50	307-24-4	
PFHxS	ND	4.4	0.80	1	11/06/202011:50	355-46-4	
PFOA	6.0	4.7	1.1	1	11/06/202011:50	335-67-1	
PFOS	ND	4.5	0.76	1	11/06/202011:50	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	92	50 - 150	Pass
13C2_PFDA	2.0	1.5	76	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	719203	328468 - 985403	458515 - 917030	Pass
13C4_PFOS	1527979	700718 - 2102153	1015246 - 2030493	Pass
d3-MeFOSAA	875364	373820 - 1121461	554807 - 1109614	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs

Sample Analysis Summary

Client's Sample ID	SM27-MW07	Date Extracted	11/05/2020
Lab Sample ID	10537507007	Total Amount Extracted	103 mL
Filename	W201106B_018	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_015
Collected	10/28/2020	Ending CCal	W201106B_023
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	16	4.9	0.91	1	11/06/202011:58	375-22-4	
PFPeA	6.7	4.9	1.3	1	11/06/202011:58	2706-90-3	
PFBS	ND	4.3	1.0	1	11/06/202011:58	375-73-5	
PFHxA	9.3	4.9	1.1	1	11/06/202011:58	307-24-4	
PFHxS	ND	4.6	0.83	1	11/06/202011:58	355-46-4	
PFOA	11	4.9	1.1	1	11/06/202011:58	335-67-1	
PFOS	12	4.7	0.78	1	11/06/202011:58	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	92	50 - 150	Pass
13C2_PFDA	2.0	1.5	75	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	728829	328468 - 985403	458515 - 917030	Pass
13C4_PFOS	1545049	700718 - 2102153	1015246 - 2030493	Pass
d3-MeFOSAA	880480	373820 - 1121461	554807 - 1109614	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

Client's Sample ID	SM27-MW08	Date Extracted	11/05/2020
Lab Sample ID	10537507008	Total Amount Extracted	27.9 mL
Filename	W201106B_019	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_015
Collected	10/30/2020	Ending CCal	W201106B_023
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	98	18	3.4	1	11/06/202012:07	375-22-4	
PFPeA	ND	18	4.8	1	11/06/202012:07	2706-90-3	
PFBS	ND	16	3.8	1	11/06/202012:07	375-73-5	
PFHxA	ND	18	3.9	1	11/06/202012:07	307-24-4	
PFHxS	ND	17	3.0	1	11/06/202012:07	355-46-4	
PFOA	ND	18	4.2	1	11/06/202012:07	335-67-1	
PFOS	ND	17	2.9	1	11/06/202012:07	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	2.2	108	50 - 150	Pass
13C2_PFDA	2.0	1.9	95	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	695557	328468 - 985403	458515 - 917030	Pass
13C4_PFOS	1522930	700718 - 2102153	1015246 - 2030493	Pass
d3-MeFOSAA	833006	373820 - 1121461	554807 - 1109614	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

Client's Sample ID	SM27-MW02-D	Date Extracted	11/05/2020
Lab Sample ID	10537507009	Total Amount Extracted	106 mL
Filename	W201106B_020	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_015
Collected	10/29/2020	Ending CCal	W201106B_023
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	86	4.7	0.88	1	11/06/2020 12:15	375-22-4	
PFPeA	12	4.7	1.3	1	11/06/2020 12:15	2706-90-3	
PFBS	ND	4.1	1.0	1	11/06/2020 12:15	375-73-5	
PFHxA	7.8	4.7	1.0	1	11/06/2020 12:15	307-24-4	
PFHxS	ND	4.4	0.80	1	11/06/2020 12:15	355-46-4	
PFOA	12	4.7	1.1	1	11/06/2020 12:15	335-67-1	
PFOS	ND	4.5	0.76	1	11/06/2020 12:15	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	92	50 - 150	Pass
13C2_PFDA	2.0	1.6	78	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	729288	328468 - 985403	458515 - 917030	Pass
13C4_PFOS	1575147	700718 - 2102153	1015246 - 2030493	Pass
d3-MeFOSAA	868882	373820 - 1121461	554807 - 1109614	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs
Sample Analysis Summary

Client's Sample ID	SM27-EB01	Date Extracted	11/05/2020
Lab Sample ID	10537507010	Total Amount Extracted	247 mL
Filename	W201106B_010	ICAL ID	201106A04
Matrix	Non_Potable_Wat	Starting CCal	W201106B_003
Collected	10/29/2020	Ending CCal	W201106B_015
Received	10/30/2020	Method Blank Filename	W201106B_005

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	2.0	0.38	1	11/06/2020 10:51	375-22-4	
PFPeA	ND	2.0	0.55	1	11/06/2020 10:51	2706-90-3	
PFBS	2.2	1.8	0.43	1	11/06/2020 10:51	375-73-5	
PFHxA	ND	2.0	0.44	1	11/06/2020 10:51	307-24-4	
PFHxS	ND	1.9	0.34	1	11/06/2020 10:51	355-46-4	
PFOA	ND	2.0	0.47	1	11/06/2020 10:51	335-67-1	
PFOS	ND	1.9	0.33	1	11/06/2020 10:51	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	2.1	103	50 - 150	Pass
13C2_PFDA	2.0	1.7	86	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	689389	328468 - 985403	448859 - 897718	Pass
13C4_PFOS	1501675	700718 - 2102153	975648 - 1951296	Pass
d3-MeFOSAA	859715	373820 - 1121461	531559 - 1063118	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Blank Analysis Summary

Lab Sample ID	BLANK-83826	Total Amount Extracted	251 mL
Filename	W201106B_005	ICAL ID	201106A04
Matrix	Water	Starting CCal	W201106B_003
Date Extracted	11/05/2020	Ending CCal	W201106B_015

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBA	ND	2.0	0.37	1	11/06/2020 10:09	375-22-4	
PFPeA	ND	2.0	0.54	1	11/06/2020 10:09	2706-90-3	
PFBS	ND	1.8	0.42	1	11/06/2020 10:09	375-73-5	
PFHxA	ND	2.0	0.44	1	11/06/2020 10:09	307-24-4	
PFHxS	ND	1.9	0.34	1	11/06/2020 10:09	355-46-4	
PFOA	ND	2.0	0.47	1	11/06/2020 10:09	335-67-1	
PFOS	ND	1.9	0.32	1	11/06/2020 10:09	1763-23-1	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	2.0	102	70 - 130	Pass
13C2_PFDA	2.0	1.9	94	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	695016	328468 - 985403	448859 - 897718	Pass
13C4_PFOS	1505829	700718 - 2102153	975648 - 1951296	Pass
d3-MeFOSAA	821897	373820 - 1121461	531559 - 1063118	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Laboratory Control Sample (LCS)

LCS Lab Sample ID	LCS-83827		
LCS Filename	W201106B_006	Matrix	Water
Total Amount Extracted	249mL	Dilution	1
ICAL ID	201106A04	Extracted	11/05/2020
Start CCal Filename	W201106B_003	Analyzed	11/06/2020 10:18
End CCal Filename	W201106B_015	Injected By	NH
Method Blank Filename	W201106B_005		

Compound	Spiked (ng/L)	Recovered (ng/L)	Recovery %	Limits
PFBA	20	20	101	80.0 - 120.0
PFPeA	20	19	95	80.0 - 120.0
PFBS	18	17	97	80.0 - 120.0
PFHxA	20	19	96	80.0 - 120.0
PFHxS	19	19	101	80.0 - 120.0
PFOA	20	19	95	80.0 - 120.0
PFOS	19	18	93	80.0 - 120.0

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	2.0	98	70 - 130	Pass
13C2_PFDA	2.0	1.8	88	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	696107	328468 - 985403	448859 - 897718	Pass
13C4_PFOS	1485243	700718 - 2102153	975648 - 1951296	Pass
d3-MeFOSAA	832462	373820 - 1121461	531559 - 1063118	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Matrix Spike Sample (MS)

MS Lab Sample ID	10537507001-MS		
MS Filename	W201106B_021	Matrix	Non_Potable_Water
Total Amount Extracted	102mL	Dilution	1
ICAL ID	201106A04	Extracted	11/05/2020
Start CCal Filename	W201106B_015	Analyzed	11/06/2020 12:23
End CCal Filename	W201106B_023	Injected By	NH
Method Blank Filename	W201106B_005		

Compound	Spike (ng/L)	Sample (ng/L)	Recovered (ng/L)	Recovery %	Limits	Flags
PFBA	49	30	71	83	70.0 - 130.0	
PFPeA	49	11	52	83	70.0 - 130.0	
PFBS	43	6.7	49	97	70.0 - 130.0	
PFHxA	49	15	61	93	70.0 - 130.0	
PFHxS	46	100	150	110	70.0 - 130.0	
PFOA	49	21	66	92	70.0 - 130.0	
PFOS	47	93	150	113	70.0 - 130.0	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	2.0	98	50 - 150	Pass
13C2_PFDA	2.0	1.6	78	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	706580	328468 - 985403	458515 - 917030	Pass
13C4_PFOS	1505045	700718 - 2102153	1015246 - 2030493	Pass
d3-MeFOSAA	856276	373820 - 1121461	554807 - 1109614	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612) 607-1700

MPCA Guidance PFCs Matrix Spike Sample Duplicate (MSD)

MSD Lab Sample ID	10537507001-MSD		
MSD Filename	W201106B_022	MS Filename	W201106B_021
Total Amount Extracted	102mL	Matrix	Non_Potable_Water
ICAL ID	201106A04	Dilution	1
Start CCal Filename	W201106B_015	Extracted	11/05/2020
End CCal Filename	W201106B_023	Analyzed	11/06/2020 12:32
Method Blank Filename	W201106B_005	Injected By	NH

Compound	Spike (ng/L)	Sample (ng/L)	Recovered (ng/L)	Recovery %	Recovery Limits	Flags	RPD %
PFBA	49	30	67	75	70.0 - 130.0		11
PFPeA	49	11	49	77	70.0 - 130.0		8
PFBS	43	6.7	49	98	70.0 - 130.0		1
PFHxA	49	15	55	81	70.0 - 130.0		14
PFHxS	46	100	140	79	70.0 - 130.0		33
PFOA	49	21	59	78	70.0 - 130.0		17
PFOS	47	93	130	81	70.0 - 130.0		33

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	88	50 - 150	Pass
13C2_PFDA	2.0	1.3	64	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C2_PFOA	755295	328468 - 985403	458515 - 917030	Pass
13C4_PFOS	1630431	700718 - 2102153	1015246 - 2030493	Pass
d3-MeFOSAA	910883	373820 - 1121461	554807 - 1109614	Pass

50-150% of Ical area
70-140% of the preceding CCV area

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PCDD/PCDF

Report Information:

Pace Project #: 10537511
Sample Receipt Date: 10/30/2020
Client Project #: 200402
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Ashley Williams, your Pace Project Manager.

This report has been reviewed by:

November 13, 2020

Ashley Williams, Project Manager
(612) 346-8158
(612) 607-6444 (fax)
ashley.williams@pacelabs.com

Report Prepared Date:
November 13, 2020

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on ten samples submitted by a representative of BayWest, LLC. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using a modified version of USEPA Method 8290A. The estimated detection limits (EDLs) were based on signal-to-noise measurements. Estimated maximum possible concentration (EMPC) values were treated as positives in the toxic equivalence calculations.

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 54-121%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290A. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

Values were flagged "I" where incorrect isotope ratios were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to contain trace levels of selected congeners. These levels were below the calibration range of the method. Sample levels similar to the corresponding blank levels were flagged "B" on the results tables and may be, at least partially, attributed to the background. It should be noted that levels less than ten times the background are not generally considered to be statistically different from the background.

Laboratory spike samples were also prepared with the sample batch using clean reference matrix that had been fortified with native standard materials. The results show that the spiked native compounds were recovered at 92-118% with relative percent differences of 0.0-6.1%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Mississippi	MN00064
A2LA	2926.01	Missouri	10100
Alabama	40770	Montana	CERT0092
Alaska-DW	MN00064	Nebraska	NE-OS-18-06
Alaska-UST	17-009	Nevada	MN00064
Arizona	AZ0014	New Hampshire	2081
Arkansas - WW	88-0680	New Jersey	MN002
Arkansas-DW	MN00064	New York	11647
California	2929	North Carolina-	27700
Colorado	MN00064	North Carolina-	530
Connecticut	PH-0256	North Dakota	R-036
Florida	E87605	Ohio - VAP	CL101
Georgia	959	Ohio-DW	41244
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Massachusetts-	via MN 027-053	West Virginia-D	382
Michigan	9909	West Virginia-D	9952C
Minnesota	027-053-137	Wisconsin	999407970
Minnesota-Ag	via MN 027-053	Wyoming-UST	via A2LA 2926.
Minnesota-Petr	1240		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Report No. 10537511 8290FC DFR

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information		Section E — MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Numbe	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW0000136
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07786
Phone:	651-291-3493	Copy To:	tharsch@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:							

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

Preservatives: HCL

WO# : 10537511

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground	10/28/20	1655	8	X	X	X	X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	10/29/20	1215		X	X	X	X	002
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	10/29/20	1545		X	X	X	X	003
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	10/30/20	1135		X	X	X	X	004
5	854577	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	10/29/20	0935		X	X	X	X	005
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	10/28/20	1128		X	X	X	X	006
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	10/28/20	1439		X	X	X	X	007
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	10/30/20	0925		X	X	X	X	008
9	847410	SW27-MW02-D	QC-FR	G	WG	NW	Wtr-Ground	10/29/20	1245		X	X	X	X	009
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	10/29/20	1315		X	X	X	X	010
11															
12															TN 103020

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		10/30/20	1250	TN Pace	103020	1250	~~0.6~~ 5.1 ~~5.6~~ 5.0 ~~NO~~

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ZACH MASON

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 10/30/20

Temp (°C) | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Temp : 1.0, 4.3, 4.8, 3.9, 3.2

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: WO#: 10537511
PM: AW1 Due Date: 11/13/20
CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☑Yes ☐No

Thermometer: ☑T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☐T5(0489) **Type of Ice:** ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No **Were All Container Temps Taken?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** _____ °C **Average Corrected Temp (no temp blank only):** _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: True **Cooler Temp Corrected w/temp blank:** 1.0, 4.3, 4.8, 3.9, 3.2 °C

USDA Regulated Soil: (☑ N/A, water sample/Other:_____)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☑No

Date/Initials of Person Examining Contents: 10 30 20 TN

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☑No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

Chain of Custody Present and Filled Out?	☑Yes	☐No		**COMMENTS:** 1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☑Yes ☑Yes	☐No ☐No		8.
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑Water ☐Soil ☐Oil ☐Other_____	☑Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑Yes	☐No	☐N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑Yes	☐No	☐N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	
Trip Blank Present?	☐Yes	☐No	☑N/A	14. Pace Trip Blank Lot # (if purchased):_____
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ **Field Data Required?** ☐Yes ☐No

Comments/Resolution: _____

Project Manager Review: Ashley Williams **Date:** 11/2/2020

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW01		
Lab Sample ID	10537511001		
Filename	U201112B_08		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/28/2020 16:55
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/12/2020 19:24

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.30		2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	-----	0.30		2,3,7,8-TCDD-13C	2.00	74
					1,2,3,7,8-PeCDF-13C	2.00	86
2,3,7,8-TCDD	ND	-----	0.55		2,3,4,7,8-PeCDF-13C	2.00	89
Total TCDD	ND	-----	0.55		1,2,3,7,8-PeCDD-13C	2.00	99
					1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	-----	1.3		1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	-----	0.36		2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	-----	0.36		1,2,3,7,8,9-HxCDF-13C	2.00	82
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	-----	0.26		1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	ND	-----	0.26		1,2,3,4,6,7,8-HpCDF-13C	2.00	78
					1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	-----	0.37		1,2,3,4,6,7,8-HpCDD-13C	2.00	92
1,2,3,6,7,8-HxCDF	ND	-----	0.11		OCDD-13C	4.00	71
2,3,4,6,7,8-HxCDF	ND	-----	0.11				
1,2,3,7,8,9-HxCDF	ND	-----	0.19		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.11		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.17		2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	ND	-----	0.16				
1,2,3,7,8,9-HxCDD	ND	-----	0.17				
Total HxCDD	ND	-----	0.16				
1,2,3,4,6,7,8-HpCDF	-----	0.54	0.48	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.48		Equivalence: 0.019 pg/L		
Total HpCDF	ND	-----	0.48		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	1.1	-----	0.25	BJ			
Total HpCDD	1.1	-----	0.25	BJ			
OCDF	1.6	-----	1.0	BJ			
OCDD	4.9	-----	1.0	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW02		
Lab Sample ID	10537511002		
Filename	U201112B_09		
Injected By	SMT		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/29/2020 12:15
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/12/2020 20:05

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.81		2,3,7,8-TCDF-13C	2.00	72
Total TCDF	ND	-----	0.81		2,3,7,8-TCDD-13C	2.00	76
					1,2,3,7,8-PeCDF-13C	2.00	90
2,3,7,8-TCDD	1.0	-----	0.77	J	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	1.0	-----	0.77	J	1,2,3,7,8-PeCDD-13C	2.00	104
					1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	1.5	-----	0.65	BJ	1,2,3,6,7,8-HxCDF-13C	2.00	86
2,3,4,7,8-PeCDF	1.4	-----	0.57	J	2,3,4,6,7,8-HxCDF-13C	2.00	87
Total PeCDF	2.9	-----	0.57	BJ	1,2,3,7,8,9-HxCDF-13C	2.00	83
					1,2,3,4,7,8-HxCDD-13C	2.00	81
1,2,3,7,8-PeCDD	1.5	-----	0.64	J	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	1.5	-----	0.64	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	-----	1.1	0.54	IJ	1,2,3,4,6,7,8-HpCDD-13C	2.00	91
1,2,3,6,7,8-HxCDF	1.2	-----	0.45	J	OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	-----	0.62	0.52	IJ			
1,2,3,7,8,9-HxCDF	-----	0.80	0.38	IJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.2	-----	0.38	BJ	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.2	-----	0.42	BJ	2,3,7,8-TCDD-37Cl4	0.20	84
1,2,3,6,7,8-HxCDD	-----	0.95	0.37	IJ			
1,2,3,7,8,9-HxCDD	1.1	-----	0.30	J			
Total HxCDD	2.2	-----	0.30	BJ			
1,2,3,4,6,7,8-HpCDF	1.4	-----	0.40	BJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	-----	0.92	0.54	IJ	Equivalence: 3.7 pg/L		
Total HpCDF	1.4	-----	0.40	BJ	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	1.4	-----	0.70	BJ			
Total HpCDD	1.4	-----	0.70	BJ			
OCDF	-----	2.1	1.1	IJ			
OCDD	3.3	-----	1.4	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW03		
Lab Sample ID	10537511003		
Filename	U201112B_10		
Injected By	SMT		
Total Amount Extracted	1000 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/29/2020 15:45
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/12/2020 20:45

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.36		2,3,7,8-TCDF-13C	2.00	76
Total TCDF	ND	-----	0.36		2,3,7,8-TCDD-13C	2.00	76
					1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	ND	-----	0.88		2,3,4,7,8-PeCDF-13C	2.00	93
Total TCDD	ND	-----	0.88		1,2,3,7,8-PeCDD-13C	2.00	107
					1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	ND	-----	0.70		1,2,3,6,7,8-HxCDF-13C	2.00	85
2,3,4,7,8-PeCDF	ND	-----	0.42		2,3,4,6,7,8-HxCDF-13C	2.00	87
Total PeCDF	ND	-----	0.42		1,2,3,7,8,9-HxCDF-13C	2.00	88
					1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	-----	0.39		1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	ND	-----	0.39		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
					1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	-----	0.25		1,2,3,4,6,7,8-HpCDD-13C	2.00	95
1,2,3,6,7,8-HxCDF	ND	-----	0.27		OCDD-13C	4.00	74
2,3,4,6,7,8-HxCDF	ND	-----	0.38				
1,2,3,7,8,9-HxCDF	ND	-----	0.31		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.25		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.42		2,3,7,8-TCDD-37Cl4	0.20	90
1,2,3,6,7,8-HxCDD	ND	-----	0.41				
1,2,3,7,8,9-HxCDD	ND	-----	0.47				
Total HxCDD	ND	-----	0.41				
1,2,3,4,6,7,8-HpCDF	-----	0.65	0.50	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.58		Equivalence: 0.026 pg/L		
Total HpCDF	ND	-----	0.50		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	-----	1.5	0.67	IJ			
Total HpCDD	2.7	-----	0.67	BJ			
OCDF	2.6	-----	1.1	BJ			
OCDD	-----	12	1.4	IJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW04		
Lab Sample ID	10537511004		
Filename	U201112B_11		
Injected By	SMT		
Total Amount Extracted	978 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/30/2020 11:35
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/12/2020 21:26

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.76		2,3,7,8-TCDF-13C	2.00	68
Total TCDF	ND	-----	0.76		2,3,7,8-TCDD-13C	2.00	73
					1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	ND	-----	2.0		2,3,4,7,8-PeCDF-13C	2.00	88
Total TCDD	140	-----	2.0		1,2,3,7,8-PeCDD-13C	2.00	98
					1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	-----	0.80		1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	ND	-----	0.34		2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	ND	-----	0.34		1,2,3,7,8,9-HxCDF-13C	2.00	79
					1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	7.5	-----	1.6	J	1,2,3,6,7,8-HxCDD-13C	2.00	69
Total PeCDD	110	-----	1.6		1,2,3,4,6,7,8-HpCDF-13C	2.00	72
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	ND	-----	0.65		1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	ND	-----	0.57		OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	ND	-----	0.45				
1,2,3,7,8,9-HxCDF	ND	-----	0.42		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.42		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.61		2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	ND	-----	0.76				
1,2,3,7,8,9-HxCDD	ND	-----	0.53				
Total HxCDD	62	-----	0.53				
1,2,3,4,6,7,8-HpCDF	-----	1.7	0.82	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.63		Equivalence: 7.6 pg/L		
Total HpCDF	ND	-----	0.63		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	2.3	-----	0.58	BJ			
Total HpCDD	2.3	-----	0.58	BJ			
OCDF	9.4	-----	1.1	BJ			
OCDD	14	-----	1.6	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW05		
Lab Sample ID	10537511005		
Filename	U201112B_12		
Injected By	SMT		
Total Amount Extracted	976 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/29/2020 09:35
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/12/2020 22:07

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.50		2,3,7,8-TCDF-13C	2.00	78
Total TCDF	ND	-----	0.50		2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	102
2,3,7,8-TCDD	ND	-----	0.69		2,3,4,7,8-PeCDF-13C	2.00	106
Total TCDD	ND	-----	0.69		1,2,3,7,8-PeCDD-13C	2.00	121
					1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	-----	0.37		1,2,3,6,7,8-HxCDF-13C	2.00	85
2,3,4,7,8-PeCDF	ND	-----	0.33		2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	ND	-----	0.33		1,2,3,7,8,9-HxCDF-13C	2.00	86
					1,2,3,4,7,8-HxCDD-13C	2.00	81
1,2,3,7,8-PeCDD	ND	-----	0.37		1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	ND	-----	0.37		1,2,3,4,6,7,8-HpCDF-13C	2.00	80
					1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	-----	0.22		1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	-----	0.23		OCDD-13C	4.00	80
2,3,4,6,7,8-HxCDF	ND	-----	0.16				
1,2,3,7,8,9-HxCDF	ND	-----	0.35		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.16		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.33		2,3,7,8-TCDD-37Cl4	0.20	99
1,2,3,6,7,8-HxCDD	ND	-----	0.35				
1,2,3,7,8,9-HxCDD	ND	-----	0.47				
Total HxCDD	ND	-----	0.33				
1,2,3,4,6,7,8-HpCDF	1.0	-----	0.59	BJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.54		Equivalence: 0.011 pg/L		
Total HpCDF	1.0	-----	0.54	BJ	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.40				
Total HpCDD	ND	-----	0.40				
OCDF	-----	1.8	0.77	IJ			
OCDD	2.4	-----	0.79	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW06		
Lab Sample ID	10537511006		
Filename	U201112B_13		
Injected By	SMT		
Total Amount Extracted	990 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/28/2020 11:38
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/12/2020 22:48

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.34		2,3,7,8-TCDF-13C	2.00	75
Total TCDF	ND	-----	0.34		2,3,7,8-TCDD-13C	2.00	78
					1,2,3,7,8-PeCDF-13C	2.00	92
2,3,7,8-TCDD	ND	-----	0.61		2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	-----	0.61		1,2,3,7,8-PeCDD-13C	2.00	110
					1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	-----	0.36		1,2,3,6,7,8-HxCDF-13C	2.00	84
2,3,4,7,8-PeCDF	ND	-----	0.38		2,3,4,6,7,8-HxCDF-13C	2.00	84
Total PeCDF	ND	-----	0.36		1,2,3,7,8,9-HxCDF-13C	2.00	88
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	-----	0.59		1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	ND	-----	0.59		1,2,3,4,6,7,8-HpCDF-13C	2.00	81
					1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	-----	0.27		1,2,3,4,6,7,8-HpCDD-13C	2.00	103
1,2,3,6,7,8-HxCDF	ND	-----	0.31		OCDD-13C	4.00	81
2,3,4,6,7,8-HxCDF	ND	-----	0.23				
1,2,3,7,8,9-HxCDF	ND	-----	0.30		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.23		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.37		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.20				
1,2,3,7,8,9-HxCDD	ND	-----	0.40				
Total HxCDD	ND	-----	0.20				
1,2,3,4,6,7,8-HpCDF	-----	0.74	0.40	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.81	-----	0.45	J	Equivalence: 0.023 pg/L		
Total HpCDF	0.81	-----	0.40	BJ	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	-----	0.58	0.51	IJ			
Total HpCDD	1.4	-----	0.51	BJ			
OCDF	-----	2.2	0.70	IJ			
OCDD	-----	2.4	1.1	IJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW07		
Lab Sample ID	10537511007		
Filename	U201112B_14		
Injected By	SMT		
Total Amount Extracted	980 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/28/2020 14:39
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/12/2020 23:28

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.38		2,3,7,8-TCDF-13C	2.00	83
Total TCDF	ND	-----	0.38		2,3,7,8-TCDD-13C	2.00	91
					1,2,3,7,8-PeCDF-13C	2.00	110
2,3,7,8-TCDD	ND	-----	0.65		2,3,4,7,8-PeCDF-13C	2.00	108
Total TCDD	ND	-----	0.65		1,2,3,7,8-PeCDD-13C	2.00	121
					1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	-----	0.50		1,2,3,6,7,8-HxCDF-13C	2.00	94
2,3,4,7,8-PeCDF	ND	-----	0.25		2,3,4,6,7,8-HxCDF-13C	2.00	94
Total PeCDF	ND	-----	0.25		1,2,3,7,8,9-HxCDF-13C	2.00	94
					1,2,3,4,7,8-HxCDD-13C	2.00	88
1,2,3,7,8-PeCDD	ND	-----	0.59		1,2,3,6,7,8-HxCDD-13C	2.00	87
Total PeCDD	ND	-----	0.59		1,2,3,4,6,7,8-HpCDF-13C	2.00	89
					1,2,3,4,7,8,9-HpCDF-13C	2.00	80
1,2,3,4,7,8-HxCDF	ND	-----	0.28		1,2,3,4,6,7,8-HpCDD-13C	2.00	105
1,2,3,6,7,8-HxCDF	ND	-----	0.27		OCDD-13C	4.00	83
2,3,4,6,7,8-HxCDF	ND	-----	0.16				
1,2,3,7,8,9-HxCDF	ND	-----	0.29		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.16		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.24		2,3,7,8-TCDD-37Cl4	0.20	91
1,2,3,6,7,8-HxCDD	ND	-----	0.27				
1,2,3,7,8,9-HxCDD	ND	-----	0.20				
Total HxCDD	ND	-----	0.20				
1,2,3,4,6,7,8-HpCDF	-----	0.73	0.55	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.48		Equivalence: 0.016 pg/L		
Total HpCDF	ND	-----	0.48		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	0.76	-----	0.39	BJ			
Total HpCDD	0.76	-----	0.39	BJ			
OCDF	-----	1.9	1.2	IJ			
OCDD	3.0	-----	1.1	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW08		
Lab Sample ID	10537511008		
Filename	U201112B_15		
Injected By	SMT		
Total Amount Extracted	970 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/30/2020 09:25
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/13/2020 00:09

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.63		2,3,7,8-TCDF-13C	2.00	62
Total TCDF	ND	-----	0.63		2,3,7,8-TCDD-13C	2.00	66
					1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	-----	0.98		2,3,4,7,8-PeCDF-13C	2.00	81
Total TCDD	59	-----	0.98		1,2,3,7,8-PeCDD-13C	2.00	91
					1,2,3,4,7,8-HxCDF-13C	2.00	67
1,2,3,7,8-PeCDF	ND	-----	0.89		1,2,3,6,7,8-HxCDF-13C	2.00	71
2,3,4,7,8-PeCDF	ND	-----	0.22		2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	ND	-----	0.22		1,2,3,7,8,9-HxCDF-13C	2.00	73
					1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	ND	-----	0.97		1,2,3,6,7,8-HxCDD-13C	2.00	61
Total PeCDD	56	-----	0.97		1,2,3,4,6,7,8-HpCDF-13C	2.00	66
					1,2,3,4,7,8,9-HpCDF-13C	2.00	60
1,2,3,4,7,8-HxCDF	ND	-----	0.65		1,2,3,4,6,7,8-HpCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	ND	-----	0.29		OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	ND	-----	0.57				
1,2,3,7,8,9-HxCDF	ND	-----	0.43		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.29		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.89		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	-----	0.66				
1,2,3,7,8,9-HxCDD	ND	-----	0.67				
Total HxCDD	28	-----	0.66	J			
1,2,3,4,6,7,8-HpCDF	-----	1.0	0.61	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.67		Equivalence: 0.068 pg/L		
Total HpCDF	1.7	-----	0.61	BJ	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	4.7	-----	1.1	BJ			
Total HpCDD	4.7	-----	1.1	BJ			
OCDF	-----	2.2	1.1	IJ			
OCDD	36	-----	1.9	BJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW02-D		
Lab Sample ID	10537511009		
Filename	U201112B_16		
Injected By	SMT		
Total Amount Extracted	1020 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/29/2020 12:45
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/13/2020 00:50

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.38		2,3,7,8-TCDF-13C	2.00	78
Total TCDF	ND	-----	0.38		2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	103
2,3,7,8-TCDD	0.45	-----	0.38	J	2,3,4,7,8-PeCDF-13C	2.00	106
Total TCDD	0.45	-----	0.38	J	1,2,3,7,8-PeCDD-13C	2.00	121
					1,2,3,4,7,8-HxCDF-13C	2.00	80
1,2,3,7,8-PeCDF	ND	-----	0.41		1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	-----	0.20		2,3,4,6,7,8-HxCDF-13C	2.00	89
Total PeCDF	ND	-----	0.20		1,2,3,7,8,9-HxCDF-13C	2.00	88
					1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	-----	0.39		1,2,3,6,7,8-HxCDD-13C	2.00	79
Total PeCDD	ND	-----	0.39		1,2,3,4,6,7,8-HpCDF-13C	2.00	77
					1,2,3,4,7,8,9-HpCDF-13C	2.00	57
1,2,3,4,7,8-HxCDF	ND	-----	0.40		1,2,3,4,6,7,8-HpCDD-13C	2.00	89
1,2,3,6,7,8-HxCDF	ND	-----	0.25		OCDD-13C	4.00	70
2,3,4,6,7,8-HxCDF	ND	-----	0.27				
1,2,3,7,8,9-HxCDF	ND	-----	0.20		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.20		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.23		2,3,7,8-TCDD-37Cl4	0.20	89
1,2,3,6,7,8-HxCDD	ND	-----	0.33				
1,2,3,7,8,9-HxCDD	ND	-----	0.29				
Total HxCDD	ND	-----	0.23				
1,2,3,4,6,7,8-HpCDF	-----	1.1	0.56	IJ	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.57		Equivalence: 0.47 pg/L		
Total HpCDF	ND	-----	0.56		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	0.84	-----	0.58	BJ			
Total HpCDD	0.84	-----	0.58	BJ			
OCDF	ND	-----	1.2				
OCDD	-----	3.4	0.98	IJ			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-EB01		
Lab Sample ID	10537511010		
Filename	U201112B_17		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	10/29/2020 13:15
ICAL ID	U201013	Received	10/30/2020 12:50
CCal Filename(s)	U201112B_01 & U201112B_19	Extracted	11/06/2020 12:22
Method Blank ID	BLANK-83916	Analyzed	11/13/2020 01:30

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.20		2,3,7,8-TCDF-13C	2.00	68
Total TCDF	ND	-----	0.20		2,3,7,8-TCDD-13C	2.00	73
					1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	ND	-----	0.73		2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD	ND	-----	0.73		1,2,3,7,8-PeCDD-13C	2.00	103
					1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	-----	0.55		1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	ND	-----	0.15		2,3,4,6,7,8-HxCDF-13C	2.00	78
Total PeCDF	ND	-----	0.15		1,2,3,7,8,9-HxCDF-13C	2.00	76
					1,2,3,4,7,8-HxCDD-13C	2.00	73
1,2,3,7,8-PeCDD	ND	-----	0.44		1,2,3,6,7,8-HxCDD-13C	2.00	69
Total PeCDD	ND	-----	0.44		1,2,3,4,6,7,8-HpCDF-13C	2.00	65
					1,2,3,4,7,8,9-HpCDF-13C	2.00	54
1,2,3,4,7,8-HxCDF	ND	-----	0.39		1,2,3,4,6,7,8-HpCDD-13C	2.00	77
1,2,3,6,7,8-HxCDF	ND	-----	0.27		OCDD-13C	4.00	62
2,3,4,6,7,8-HxCDF	ND	-----	0.32				
1,2,3,7,8,9-HxCDF	ND	-----	0.25		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.25		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.48		2,3,7,8-TCDD-37Cl4	0.20	90
1,2,3,6,7,8-HxCDD	ND	-----	0.60				
1,2,3,7,8,9-HxCDD	ND	-----	0.52				
Total HxCDD	ND	-----	0.48				
1,2,3,4,6,7,8-HpCDF	ND	-----	0.63		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.68		Equivalence: 0.0089 pg/L		
Total HpCDF	ND	-----	0.63		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	-----	0.89	0.77	IJ			
Total HpCDD	2.1	-----	0.77	BJ			
OCDF	ND	-----	1.1				
OCDD	ND	-----	1.3				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
B = Less than 10x higher than method blank level
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Lab Sample Name	DFBLKIA		
Lab Sample ID	BLANK-83916	Matrix	Water
Filename	U201111B_15	Dilution	NA
Total Amount Extracted	1050 mL	Extracted	11/06/2020 12:22
ICAL ID	U201013	Analyzed	11/12/2020 06:40
CCal Filename(s)	U201111A_19 & U201111B_18	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.54		2,3,7,8-TCDF-13C	2.00	79
Total TCDF	ND	-----	0.54		2,3,7,8-TCDD-13C	2.00	83
					1,2,3,7,8-PeCDF-13C	2.00	95
2,3,7,8-TCDD	ND	-----	0.88		2,3,4,7,8-PeCDF-13C	2.00	102
Total TCDD	ND	-----	0.88		1,2,3,7,8-PeCDD-13C	2.00	109
					1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	1.0	-----	0.90	J	1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	-----	0.78	0.49	IJ	2,3,4,6,7,8-HxCDF-13C	2.00	87
Total PeCDF	1.0	-----	0.49	J	1,2,3,7,8,9-HxCDF-13C	2.00	90
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	-----	0.75	0.53	IJ	1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	ND	-----	0.53		1,2,3,4,6,7,8-HpCDF-13C	2.00	79
					1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	1.4	-----	0.45	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	92
1,2,3,6,7,8-HxCDF	-----	1.1	0.40	IJ	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	-----	0.68	0.37	IJ			
1,2,3,7,8,9-HxCDF	-----	1.1	0.55	IJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.4	-----	0.37	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.76	-----	0.35	J	2,3,7,8-TCDD-37Cl4	0.20	98
1,2,3,6,7,8-HxCDD	ND	-----	0.48				
1,2,3,7,8,9-HxCDD	-----	0.84	0.43	IJ			
Total HxCDD	0.76	-----	0.35	J			
1,2,3,4,6,7,8-HpCDF	1.2	-----	0.49	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	-----	1.1	0.83	IJ	Equivalence: 1.6 pg/L		
Total HpCDF	1.2	-----	0.49	J	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	1.5	-----	0.60	J			
Total HpCDD	1.5	-----	0.60	J			
OCDF	4.5	-----	1.3	J			
OCDD	4.6	-----	1.5	J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

J = Estimated value
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCS-83917		
Filename	U201111B_16	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL ID	U201013	Extracted	11/06/2020 12:22
CCal Filename(s)	U201111A_19 & U201111B_18	Analyzed	11/12/2020 07:21
Method Blank ID	BLANK-83916	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.21	104	2,3,7,8-TCDF-13C	2.0	82
Total TCDF				2,3,7,8-TCDD-13C	2.0	88
				1,2,3,7,8-PeCDF-13C	2.0	105
2,3,7,8-TCDD	0.20	0.19	96	2,3,4,7,8-PeCDF-13C	2.0	105
Total TCDD				1,2,3,7,8-PeCDD-13C	2.0	117
				1,2,3,4,7,8-HxCDF-13C	2.0	83
1,2,3,7,8-PeCDF	1.0	1.1	106	1,2,3,6,7,8-HxCDF-13C	2.0	89
2,3,4,7,8-PeCDF	1.0	1.1	110	2,3,4,6,7,8-HxCDF-13C	2.0	90
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.0	92
				1,2,3,4,7,8-HxCDD-13C	2.0	81
1,2,3,7,8-PeCDD	1.0	0.93	93	1,2,3,6,7,8-HxCDD-13C	2.0	83
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.0	78
				1,2,3,4,7,8,9-HpCDF-13C	2.0	72
1,2,3,4,7,8-HxCDF	1.0	1.2	118	1,2,3,4,6,7,8-HpCDD-13C	2.0	94
1,2,3,6,7,8-HxCDF	1.0	1.0	104	OCDD-13C	4.0	65
2,3,4,6,7,8-HxCDF	1.0	1.0	104			
1,2,3,7,8,9-HxCDF	1.0	1.0	102	1,2,3,4-TCDD-13C	2.0	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.0	NA
1,2,3,4,7,8-HxCDD	1.0	1.1	113	2,3,7,8-TCDD-37Cl4	0.20	96
1,2,3,6,7,8-HxCDD	1.0	1.1	108			
1,2,3,7,8,9-HxCDD	1.0	1.1	110			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.0	1.0	105			
1,2,3,4,7,8,9-HpCDF	1.0	0.99	99			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.0	0.96	96			
Total HpCDD						
OCDF	2.0	2.1	106			
OCDD	2.0	2.1	106			

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCSD-83918		
Filename	U201111B_17	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL ID	U201013	Extracted	11/06/2020 12:22
CCal Filename(s)	U201111A_19 & U201111B_18	Analyzed	11/12/2020 08:02
Method Blank ID	BLANK-83916	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.21	104	2,3,7,8-TCDF-13C	2.0	78
Total TCDF				2,3,7,8-TCDD-13C	2.0	86
				1,2,3,7,8-PeCDF-13C	2.0	102
2,3,7,8-TCDD	0.20	0.19	95	2,3,4,7,8-PeCDF-13C	2.0	105
Total TCDD				1,2,3,7,8-PeCDD-13C	2.0	116
				1,2,3,4,7,8-HxCDF-13C	2.0	84
1,2,3,7,8-PeCDF	1.0	1.0	104	1,2,3,6,7,8-HxCDF-13C	2.0	88
2,3,4,7,8-PeCDF	1.0	1.1	106	2,3,4,6,7,8-HxCDF-13C	2.0	88
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.0	87
				1,2,3,4,7,8-HxCDD-13C	2.0	79
1,2,3,7,8-PeCDD	1.0	0.92	92	1,2,3,6,7,8-HxCDD-13C	2.0	83
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.0	77
				1,2,3,4,7,8,9-HpCDF-13C	2.0	66
1,2,3,4,7,8-HxCDF	1.0	1.1	111	1,2,3,4,6,7,8-HpCDD-13C	2.0	85
1,2,3,6,7,8-HxCDF	1.0	1.0	102	OCDD-13C	4.0	63
2,3,4,6,7,8-HxCDF	1.0	1.1	107			
1,2,3,7,8,9-HxCDF	1.0	1.0	104	1,2,3,4-TCDD-13C	2.0	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.0	NA
1,2,3,4,7,8-HxCDD	1.0	1.1	109	2,3,7,8-TCDD-37Cl4	0.20	90
1,2,3,6,7,8-HxCDD	1.0	1.1	110			
1,2,3,7,8,9-HxCDD	1.0	1.1	111			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.0	1.0	101			
1,2,3,4,7,8,9-HpCDF	1.0	1.0	102			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.0	0.96	96			
Total HpCDD						
OCDF	2.0	2.1	104			
OCDD	2.0	2.1	107			

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A

Spike Recovery Relative Percent Difference (RPD) Results

Client	Bay West, LLC		
Spike 1 ID	LCS-83917	Spike 2 ID	LCSD-83918
Spike 1 Filename	U201111B_16	Spike 2 Filename	U201111B_17

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDF	104	104	0.0
2,3,7,8-TCDD	96	95	1.0
1,2,3,7,8-PeCDF	106	104	1.9
2,3,4,7,8-PeCDF	110	106	3.7
1,2,3,7,8-PeCDD	93	92	1.1
1,2,3,4,7,8-HxCDF	118	111	6.1
1,2,3,6,7,8-HxCDF	104	102	1.9
2,3,4,6,7,8-HxCDF	104	107	2.8
1,2,3,7,8,9-HxCDF	102	104	1.9
1,2,3,4,7,8-HxCDD	113	109	3.6
1,2,3,6,7,8-HxCDD	108	110	1.8
1,2,3,7,8,9-HxCDD	110	111	0.9
1,2,3,4,6,7,8-HpCDF	105	101	3.9
1,2,3,4,7,8,9-HpCDF	99	102	3.0
1,2,3,4,6,7,8-HpCDD	96	96	0.0
OCDF	106	104	1.9
OCDD	106	107	0.9

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

March 08, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546876

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on February 03, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Lynch
colin.lynch@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546876

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10546876001	**SW27-MW01**	Water	02/02/21 17:15	02/03/21 18:05
10546876002	**SW27-MW02**	Water	02/03/21 09:58	02/03/21 18:05
10546876003	**SW27-MW03**	Water	02/01/21 13:11	02/03/21 18:05
10546876004	**SW27-MW04**	Water	02/03/21 16:07	02/03/21 18:05
10546876005	**SW27-MW05**	Water	02/02/21 15:06	02/03/21 18:05
10546876006	**SW27-MW06**	Water	02/02/21 12:10	02/03/21 18:05
10546876007	**SW27-MW07**	Water	02/03/21 12:44	02/03/21 18:05
10546876008	**SW27-MW08**	Water	02/01/21 16:22	02/03/21 18:05
10546876009	**SW27-MW02-D**	Water	02/03/21 10:13	02/03/21 18:05
10546876010	**SW27-EB01**	Water	02/03/21 13:30	02/03/21 18:05

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project:
Pace Project No.:

Method:
Description:
Client:
Date:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10546876

10546876

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

COC ID:	
Work Order Number	3000027125
Facility Code:	SW-27
Project Task Code:	PRJ07913
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives	Requested Analysis: Gross Alpha	Comments
1	847409	SW27-MW01	Sample	G	WG	NW	Wtr-Ground	2/2/21	1715	1		X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	2/3/21	0958	4		X	002
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	2/1/21	1311	1		X	003
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	2/3/21	1607	4		X	004
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	2/2/21	1506	1		X	005
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	2/2/21	1210	1		X	006
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	2/3/21	1249	4		X	007
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	2/1/21	1622	1		X	008
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	2/3/21	1013	1		X	009
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	2/3/21	1330	1		X	010
11													
12													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
NON-ADMIN	John Connelly / Bay West	2/3/21	1805	[illegible]	2-3-21	1805	Temp (°C): ~~3.5~~, 3.7, 1.6, 2.0, 0.3

Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: John Connelly

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 2/3/21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10546876

PM: CL1 **Due Date: 02/25/21**

CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☑ T2(1336) ☐ T3(0459) ☐ T4(0254) ☐ T5(0489) **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☐ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 3.0 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 3.1 °C

USDA Regulated Soil: (☑ N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** CA 2/3/21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Volume?	☑ Yes	☐ No		7.
Correct Containers Used? -Pace Containers Used?	☑ Yes ☑ Yes	☐ No ☐ No		8. BP2N
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☐ Water ☐ Soil ☐ Oil ☐ Other _____	☑ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	12. Sample # 1-10
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑ Yes	☐ No	☐ N/A	☐ NaOH ☑ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☑ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine: 0-6 Roll 221419 | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 2/4/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: CA (3)

H060

Internal Transfer Chain of Custody

Pace Analytical®
www.pacelabs.com

☐ Samples Pre-Logged into eCOC.

State Of Origin: MN
Cert. Needed: [X] Yes ☐ No

Workorder: 10546876 **Workorder Name:** 200402 SW#27 Vadnais Heights

Owner Received Date: 2/3/2021 Results Requested By: 3/4/2021

Report To	Subcontract To
Colin Lynch Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3 BP2N	Requested Analysis: Gross Alpha by EPA 900.0	LAB USE ONLY: 1314229
1	SW27-MW01	PS	2/2/2021 17:15	10546876001	Water	1	X	-01
2	SW27-MW02	PS	2/3/2021 09:58	10546876002	Water	1	X	02
3	SW27-MW03	PS	2/1/2021 13:11	10546876003	Water	1	X	03
4	SW27-MW04	PS	2/3/2021 16:07	10546876004	Water	1	X	04
5	SW27-MW05	PS	2/2/2021 15:06	10546876005	Water	1	X	05
6	SW27-MW06	PS	2/2/2021 12:10	10546876006	Water	1	X	06
7	SW27-MW07	PS	2/3/2021 12:44	10546876007	Water	1	X	07
8	SW27-MW08	PS	2/1/2021 16:22	10546876008	Water	1	X	08
9	SW27-MW02-D	PS	2/3/2021 10:13	10546876009	Water	1	X	09
10	SW27-EB01	PS	2/3/2021 13:30	10546876010	Water	1	X	10

Transfers	Released By	Date/Time	Received By	Date/Time
1	Tyler/Pace	2/4/21 1350		
2				2-5-21
3			Mpapas	900

Comments: 10 total
9371 9291 7289

Cooler Temperature on Receipt .2 °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

MPAP
5-3-2

Sample Receipt Checklist

			If Applicable	
COC Seal Present/Intact:	Y	N		
COC Signed/Accurate:	Y	N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y	N	Pres.Correct/Check:	Y N
Correct bottles used:	Y	N		
Sufficient volume sent:	Y	N		
RAD Screen <0.5 mR/hr:	Y	N		

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

March 04, 2021

Pace Analytical - Minnesota

Sample Delivery Group:	L1314229
Samples Received:	02/05/2021
Project Number:	10546876
Description:	200402 SW#27 Vadnais Heights
Site:	001
Report To:	Colin Lynch 1700 Elm Street Suite 200 Minneapolis, MN 55414

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Cp: Cover Page 1

Tc: Table of Contents 2

Ss: Sample Summary 3

Cn: Case Narrative 5

Sr: Sample Results 6

SW27-MW01 L1314229-01 6

SW27-MW02 L1314229-02 7

SW27-MW03 L1314229-03 8

SW27-MW04 L1314229-04 9

SW27-MW05 L1314229-05 10

SW27-MW06 L1314229-06 11

SW27-MW07 L1314229-07 12

SW27-MW08 L1314229-08 13

SW27-MW02-D L1314229-09 14

SW27-EB01 L1314229-10 15

Qc: Quality Control Summary 16

Radiochemistry by Method 900 16

Gl: Glossary of Terms 17

Al: Accreditations & Locations 18

Sc: Sample Chain of Custody 19

SW27-MW01 L1314229-01 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/02/21 17:15	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 16:46	JMR	Mt. Juliet, TN

SW27-MW02 L1314229-02 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/03/21 09:58	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 16:46	JMR	Mt. Juliet, TN

SW27-MW03 L1314229-03 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/21 13:11	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 16:46	JMR	Mt. Juliet, TN

SW27-MW04 L1314229-04 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/03/21 16:07	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 16:46	JMR	Mt. Juliet, TN

SW27-MW05 L1314229-05 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/02/21 15:06	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 12:57	JMR	Mt. Juliet, TN

SW27-MW06 L1314229-06 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/02/21 12:10	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 16:46	JMR	Mt. Juliet, TN

SW27-MW07 L1314229-07 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/03/21 12:44	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 12:57	JMR	Mt. Juliet, TN

SW27-MW08 L1314229-08 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/01/21 16:22	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 16:46	JMR	Mt. Juliet, TN

SW27-MW02-D L1314229-09 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/03/21 10:13	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 16:46	JMR	Mt. Juliet, TN

SW27-EB01 L1314229-10 Non-Potable Water

Collected by	Collected date/time	Received date/time
	02/03/21 13:30	02/05/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 900	WG1625853	1	03/01/21 14:57	03/03/21 12:57	JMR	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Donna Eidson
Project Manager

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	2.51		1.38	1.84	03/03/2021 16:46	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	3.89		1.60	1.99	03/03/2021 16:46	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	1.76	U	4.06	6.22	03/03/2021 16:46	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	2.43	J	3.01	4.48	03/03/2021 16:46	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	2.43		1.22	1.37	03/03/2021 12:57	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	6.34		2.28	2.84	03/03/2021 16:46	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	0.840	J	1.86	2.65	03/03/2021 12:57	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	2.35		1.60	2.21	03/03/2021 16:46	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	3.49		1.66	2.17	03/03/2021 16:46	WG1625853

Radiochemistry by Method 900

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
GROSS ALPHA	0.102	U	0.565	0.863	03/03/2021 12:57	WG1625853

Method Blank (MB)

(MB) R3627339-5 03/03/21 16:46

Analyte	MB Result	MB Qualifier	MB MDA
	pCi/l		pCi/l
GROSS ALPHA	-0.127	U	0.493

L1318555-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1318555-01 03/03/21 12:57 • (DUP) R3627339-4 03/03/21 12:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	pCi/l		%			%	
GROSS ALPHA	3.02	2.35	1	24.9	0.262		20	3

Laboratory Control Sample (LCS)

(LCS) R3627339-1 03/03/21 12:57

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
GROSS ALPHA	15.0	12.1	80.6	80.0-120	

L1318548-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1318548-01 03/03/21 12:57 • (MS) R3627339-2 03/03/21 12:57 • (MSD) R3627339-3 03/03/21 12:57

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
GROSS ALPHA	18.8	4.28	26.2	27.0	116	121	1	70.0-130			3.08		20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN, 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

H060

Internal Transfer Chain of Custody

Pace Analytical®
www.pacelabs.com

☐ Samples Pre-Logged into eCOC.

State Of Origin: MN
Cert. Needed: [X] Yes ☐ No
Owner Received Date: 2/3/2021 Results Requested By: 3/4/2021

Workorder: 10546876 **Workorder Name:** 200402 SW#27 Vadnais Heights

Report To	Subcontract To
Colin Lynch Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3, BP2N	Requested Analysis: Gross Alpha by EPA 900.0	LAB USE ONLY: 1314229
1	SW27-MW01	PS	2/2/2021 17:15	10546876001	Water	1	X	-01
2	SW27-MW02	PS	2/3/2021 09:58	10546876002	Water	1	X	02
3	SW27-MW03	PS	2/1/2021 13:11	10546876003	Water	1	X	03
4	SW27-MW04	PS	2/3/2021 16:07	10546876004	Water	1	X	04
5	SW27-MW05	PS	2/2/2021 15:06	10546876005	Water	1	X	05
6	SW27-MW06	PS	2/2/2021 12:10	10546876006	Water	1	X	06
7	SW27-MW07	PS	2/3/2021 12:44	10546876007	Water	1	X	07
8	SW27-MW08	PS	2/1/2021 16:22	10546876008	Water	1	X	08
9	SW27-MW02-D	PS	2/3/2021 10:13	10546876009	Water	1	X	09
10	SW27-EB01	PS	2/3/2021 13:30	10546876010	Water	1	X	10

Transfers	Released By	Date/Time	Received By	Date/Time
1	Kyle Pace	2/4/21 1350		
2				2-5-21
3			Mpapas	900

Comments: 10 total
9371 9291 7289

Cooler Temperature on Receipt .2 °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

MPAS
2-5-21

Sample Receipt Checklist

			If Applicable
COC Seal Present/Intact:	Y N		
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N		

Pace Analytical®	Document Name: Sample Condition Upon Receipt (SCUR) - MN	Document Revised: 12Aug2020 Page 1 of 1
	Document No.: ENV-FRM-MIN4-0150 Rev.01	Pace Analytical Services - Minneapolis

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10546876

PM: CL1 **Due Date: 02/25/21**

CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☑ T2(1336) ☐ T3(0459) ☐ T4(0254) ☐ T5(0489) **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 3.0 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 3.1 °C

USDA Regulated Soil: (☑ N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** CA 2/3/21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Volume?	☑ Yes	☐ No		7.
Correct Containers Used? -Pace Containers Used?	☑ Yes ☑ Yes	☐ No ☐ No		8. BP2N
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other	☑ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** See Exception ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	12. Sample # 1-10
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑ Yes	☐ No	☐ N/A	☐ NaOH ☑ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☑ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** See Exception ☐ ENV-FRM-MIN4-0142
				Res. Chlorine: 0-6 Roll 221419 | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. See Exception ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 2/4/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: CA (3)

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

February 12, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on February 03, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Lynch
colin.lynch@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10546877001	**SW27-MW01**	Water	02/02/21 17:15	02/03/21 18:05
10546877002	**SW27-MW02**	Water	02/03/21 09:58	02/03/21 18:05
10546877003	**SW27-MW03**	Water	02/01/21 13:11	02/03/21 18:05
10546877004	**SW27-MW04**	Water	02/03/21 16:07	02/03/21 18:05
10546877005	**SW27-MW05**	Water	02/02/21 15:06	02/03/21 18:05
10546877006	**SW27-MW06**	Water	02/02/21 12:10	02/03/21 18:05
10546877007	**SW27-MW07**	Water	02/03/21 12:49	02/03/21 18:05
10546877008	**SW27-MW08**	Water	02/01/21 16:22	02/03/21 18:05
10546877009	**SW27-MW02-D**	Water	02/03/21 10:13	02/03/21 18:05
10546877010	**SW27-EB01**	Water	02/03/21 13:30	02/03/21 18:05

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10546877001	**SW27-MW01**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877002	**SW27-MW02**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877003	**SW27-MW03**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877004	**SW27-MW04**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877005	**SW27-MW05**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877006	**SW27-MW06**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877007	**SW27-MW07**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877008	**SW27-MW08**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877009	**SW27-MW02-D**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1
10546877010	**SW27-EB01**	WI MOD DRO	TT2	2
		EPA 8270E by SIM	ZT	2
		EPA 353.2	JFP	1

PASI-M = Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Method: **WI MOD DRO**
Description: WIDRO LV GCS Silica Gel
Client: Bay West LLC
Date: February 12, 2021

General Information:
10 samples were analyzed for WI MOD DRO by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 723797

R1: RPD value was outside control limits.
- LCSD (Lab ID: 3858200)
  - WDRO C10-C28

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Method: **EPA 8270E by SIM**
Description: 8270E MSSV 14 Dioxane By SIM
Client: Bay West LLC
Date: February 12, 2021

General Information:
10 samples were analyzed for EPA 8270E by SIM by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA Mod. 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 723800

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Method: **EPA 353.2**
Description: 353.2 Nitrate + Nitrite
Client: Bay West LLC
Date: February 12, 2021

General Information:
10 samples were analyzed for EPA 353.2 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW01 **Lab ID: 10546877001** Collected: 02/02/21 17:15 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.036	1	02/04/21 11:08	02/05/21 09:56		
Surrogates									
n-Triacontane (S)	69	%.	34-125		1	02/04/21 11:08	02/05/21 09:56	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.15J**	ug/L	0.24	0.10	1	02/04/21 14:28	02/05/21 12:00	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	39	%.	30-125		1	02/04/21 14:28	02/05/21 12:00		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**1.5**	mg/L	0.10	0.018	1		02/11/21 11:53		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW02 **Lab ID: 10546877002** Collected: 02/03/21 09:58 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.036	1	02/04/21 11:08	02/05/21 10:03		
Surrogates									
n-Triacontane (S)	69	%.	34-125		1	02/04/21 11:08	02/05/21 10:03	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	02/04/21 14:28	02/05/21 12:18	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	35	%.	30-125		1	02/04/21 14:28	02/05/21 12:18		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.14**	mg/L	0.10	0.018	1		02/11/21 11:57		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW03 **Lab ID: 10546877003** Collected: 02/01/21 13:11 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**0.059J**	mg/L	0.10	0.036	1	02/04/21 11:08	02/05/21 10:10		
Surrogates									
n-Triacontane (S)	70	%.	34-125		1	02/04/21 11:08	02/05/21 10:10	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.23**	ug/L	0.23	0.097	1	02/04/21 14:28	02/05/21 12:35	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	37	%.	30-125		1	02/04/21 14:28	02/05/21 12:35		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.034J**	mg/L	0.10	0.018	1		02/11/21 12:02		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW04 **Lab ID: 10546877004** Collected: 02/03/21 16:07 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.034	1	02/04/21 11:08	02/05/21 10:17		
Surrogates									
n-Triacontane (S)	67	%.	34-125		1	02/04/21 11:08	02/05/21 10:17	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.23**	ug/L	0.23	0.097	1	02/04/21 14:28	02/05/21 12:53	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	37	%.	30-125		1	02/04/21 14:28	02/05/21 12:53		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**<0.10**	mg/L	0.10	0.018	1		02/11/21 12:03		FS

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW05 **Lab ID: 10546877005** Collected: 02/02/21 15:06 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.11**	mg/L	0.11	0.036	1	02/04/21 11:08	02/05/21 10:24		
Surrogates									
n-Triacontane (S)	62	%.	34-125		1	02/04/21 11:08	02/05/21 10:24	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.12J**	ug/L	0.24	0.10	1	02/04/21 14:28	02/05/21 13:10	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	38	%.	30-125		1	02/04/21 14:28	02/05/21 13:10		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.87**	mg/L	0.10	0.018	1		02/11/21 12:04		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW06 **Lab ID: 10546877006** Collected: 02/02/21 12:10 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.036	1	02/04/21 11:08	02/05/21 10:31		
Surrogates									
n-Triacontane (S)	72	%.	34-125		1	02/04/21 11:08	02/05/21 10:31	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.15J**	ug/L	0.25	0.11	1	02/04/21 14:28	02/05/21 13:27	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	38	%.	30-125		1	02/04/21 14:28	02/05/21 13:27		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**<0.10**	mg/L	0.10	0.018	1		02/11/21 12:06		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW07 **Lab ID: 10546877007** Collected: 02/03/21 12:49 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.036	1	02/04/21 11:08	02/05/21 10:38		
Surrogates									
n-Triacontane (S)	66	%.	34-125		1	02/04/21 11:08	02/05/21 10:38	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.54**	ug/L	0.23	0.097	1	02/04/21 14:28	02/05/21 13:45	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	33	%.	30-125		1	02/04/21 14:28	02/05/21 13:45		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.10	0.018	1		02/11/21 12:21		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW08 **Lab ID: 10546877008** Collected: 02/01/21 16:22 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.036	1	02/04/21 11:08	02/05/21 10:45		
Surrogates									
n-Triacontane (S)	45	%.	34-125		1	02/04/21 11:08	02/05/21 10:45	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.20J**	ug/L	0.25	0.11	1	02/04/21 14:28	02/05/21 14:02	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	38	%.	30-125		1	02/04/21 14:28	02/05/21 14:02		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.020J**	mg/L	0.10	0.018	1		02/11/21 12:08		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-MW02-D **Lab ID: 10546877009** Collected: 02/03/21 10:13 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.035	1	02/04/21 11:08	02/05/21 10:52		
Surrogates									
n-Triacontane (S)	42	%.	34-125		1	02/04/21 11:08	02/05/21 10:52	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.14J**	ug/L	0.24	0.10	1	02/04/21 14:28	02/05/21 14:20	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	41	%.	30-125		1	02/04/21 14:28	02/05/21 14:20		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.17**	mg/L	0.10	0.018	1		02/11/21 12:09		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Sample: SW27-EB01 **Lab ID: 10546877010** Collected: 02/03/21 13:30 Received: 02/03/21 18:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.10**	mg/L	0.10	0.035	1	02/04/21 11:08	02/05/21 10:59		
Surrogates									
n-Triacontane (S)	67	%.	34-125		1	02/04/21 11:08	02/05/21 10:59	638-68-6	
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**0.18J**	ug/L	0.24	0.10	1	02/04/21 14:28	02/05/21 14:37	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	39	%.	30-125		1	02/04/21 14:28	02/05/21 14:37		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**<0.10**	mg/L	0.10	0.018	1		02/11/21 12:10		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

QC Batch: 723800
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E Water 14 Dioxane by SIM
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10546877001, 10546877002, 10546877003, 10546877004, 10546877005, 10546877006, 10546877007, 10546877008, 10546877009, 10546877010

METHOD BLANK: 3858207 Matrix: Water
Associated Lab Samples: 10546877001, 10546877002, 10546877003, 10546877004, 10546877005, 10546877006, 10546877007, 10546877008, 10546877009, 10546877010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (SIM)	ug/L	<0.25	0.25	0.11	02/05/21 10:51	
1,4-Dioxane-d8 (S)	%.	35	30-125		02/05/21 10:51	

LABORATORY CONTROL SAMPLE & LCSD: 3858208 3858209

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (SIM)	ug/L	10	12.5	13.4	125	134	59-134	7	20	
1,4-Dioxane-d8 (S)	%.				36	30	30-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

QC Batch: 723797
QC Batch Method: WI MOD DRO
Analysis Method: WI MOD DRO
Analysis Description: WIDRO Low Volume GCS w/Cleanup
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10546877001, 10546877002, 10546877003, 10546877004, 10546877005, 10546877006, 10546877007, 10546877008, 10546877009, 10546877010

METHOD BLANK: 3858198 Matrix: Water
Associated Lab Samples: 10546877001, 10546877002, 10546877003, 10546877004, 10546877005, 10546877006, 10546877007, 10546877008, 10546877009, 10546877010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	<0.10	0.10	0.034	02/05/21 09:42	
n-Triacontane (S)	%.	56	34-125		02/05/21 09:42	

LABORATORY CONTROL SAMPLE & LCSD: 3858199 3858200

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	0.8	0.42	0.52	52	65	42-125	22	20	R1
n-Triacontane (S)	%.				55	68	34-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

QC Batch: 724869 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10546877001, 10546877002, 10546877003, 10546877004, 10546877005, 10546877006, 10546877007, 10546877008, 10546877009, 10546877010

METHOD BLANK: 3863442 — Matrix: Water
Associated Lab Samples: 10546877001, 10546877002, 10546877003, 10546877004, 10546877005, 10546877006, 10546877007, 10546877008, 10546877009, 10546877010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.10	0.10	0.018	02/11/21 12:22	FS

LABORATORY CONTROL SAMPLE: 3863443

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3863444 3863445

Parameter	Units	10546877001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.5	1	1	2.6	2.6	106	104	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3863446 3863447

Parameter	Units	10546877002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.14	1	1	1.2	1.2	101	101	90-110	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 724007

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

FS	The sample was filtered in the laboratory prior to analysis.
R1	RPD value was outside control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10546877

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10546877001	**SW27-MW01**	WI MOD DRO	723797	WI MOD DRO	724011
10546877002	**SW27-MW02**	WI MOD DRO	723797	WI MOD DRO	724011
10546877003	**SW27-MW03**	WI MOD DRO	723797	WI MOD DRO	724011
10546877004	**SW27-MW04**	WI MOD DRO	723797	WI MOD DRO	724011
10546877005	**SW27-MW05**	WI MOD DRO	723797	WI MOD DRO	724011
10546877006	**SW27-MW06**	WI MOD DRO	723797	WI MOD DRO	724011
10546877007	**SW27-MW07**	WI MOD DRO	723797	WI MOD DRO	724011
10546877008	**SW27-MW08**	WI MOD DRO	723797	WI MOD DRO	724011
10546877009	**SW27-MW02-D**	WI MOD DRO	723797	WI MOD DRO	724011
10546877010	**SW27-EB01**	WI MOD DRO	723797	WI MOD DRO	724011
10546877001	**SW27-MW01**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877002	**SW27-MW02**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877003	**SW27-MW03**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877004	**SW27-MW04**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877005	**SW27-MW05**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877006	**SW27-MW06**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877007	**SW27-MW07**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877008	**SW27-MW08**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877009	**SW27-MW02-D**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877010	**SW27-EB01**	EPA Mod. 3510C	723800	EPA 8270E by SIM	724007
10546877001	**SW27-MW01**	EPA 353.2	724869		
10546877002	**SW27-MW02**	EPA 353.2	724869		
10546877003	**SW27-MW03**	EPA 353.2	724869		
10546877004	**SW27-MW04**	EPA 353.2	724869		
10546877005	**SW27-MW05**	EPA 353.2	724869		
10546877006	**SW27-MW06**	EPA 353.2	724869		
10546877007	**SW27-MW07**	EPA 353.2	724869		
10546877008	**SW27-MW08**	EPA 353.2	724869		
10546877009	**SW27-MW02-D**	EPA 353.2	724869		
10546877010	**SW27-EB01**	EPA 353.2	724869		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10546877

10546877

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	COC ID:
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress: 1700 Elm St. Minneapolis MN, 55414	Work Order Number: 3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager: Colin Lynch	Facility Code: SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone: 612-656-2286	Project Task Code: PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				Program Code
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives	Requested Analysis: DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground	2/2/21	1715	9		X	X	X	X	X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	2/3/21	0958	9		X	X	X	X	X	002
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	2/1/21	1311	9		X	X	X	X	X	003
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	2/3/21	1607	9		X	X	X	X	X	004
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	2/2/21	1506	9		X	X	X	X	X	005
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	2/2/21	1210	9		X	X	X	X	X	006
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	2/3/21	1249	9		X	X	X	X	X	007
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	2/1/21	1622	9		X	X	X	X	X	008
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	2/3/21	1013	9		X	X	X	X	X	009
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	2/3/21	1330	9		X	X	X	X	X	010
11																	
12																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	John Connelly / Bay West	2/3/21	1805	[illegible]	2-3-21	1805	Temp (°C): 5.5, 3.1, 1.6, 2.0, 1.0, 1.3

Received on Ice (Y/N): Y

Custody Sealed Cooler (Y/N): N

Samples Intact (Y/N): Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: John Connelly

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 2/3/21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: WO#: 10546877

PM: CL1 Due Date: 02/18/21

CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☐ T4(0254) ☑ T5(0489) **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 5.4, 3.2, 1.5, 1.9, 3.9, 1.2 °C

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 5.5, 3.3, 1.6, 2.0, 4.0, 1.3 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☒ N/A, water sample/Other: _____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Date/Initials of Person Examining Contents: TS 2-3-21

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other_____
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Volume?	☑ Yes	☐ No		7.
Correct Containers Used? -Pace Containers Used?	☑ Yes ☑ Yes	☐ No ☐ No		8.
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other_____	☑ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	12. Sample # 1-10
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑ Yes	☐ No	☐ N/A	☐ NaOH ☐ HNO_3 ☑ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑ Yes	☐ No	☐ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine: 0-6 Roll 22-14-19 / 0-6 Strip / 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	14. Pace Trip Blank Lot # (if purchased): _____
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

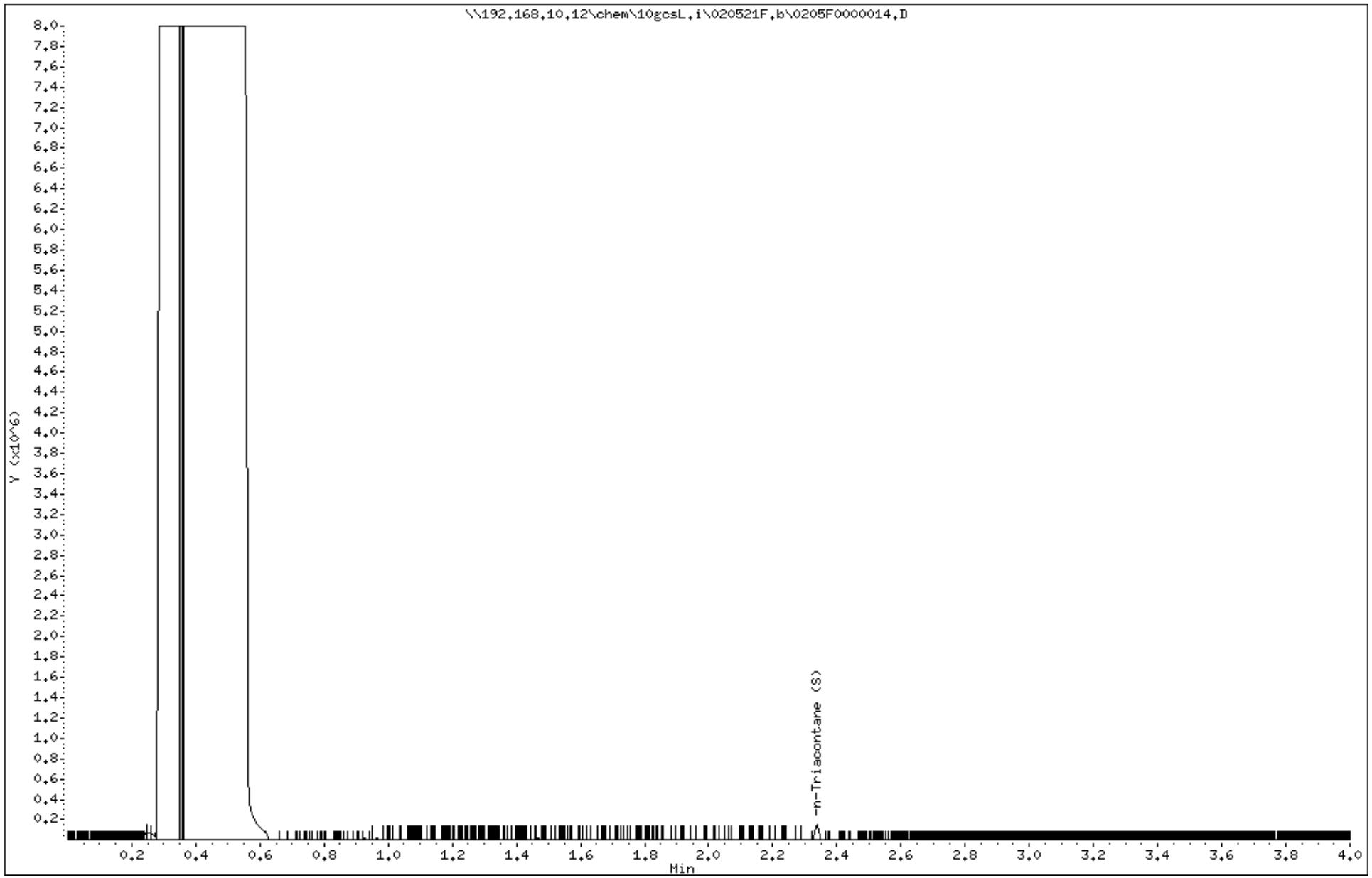
Project Manager Review: _____ **Date:** 2/4/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: TJ (3)

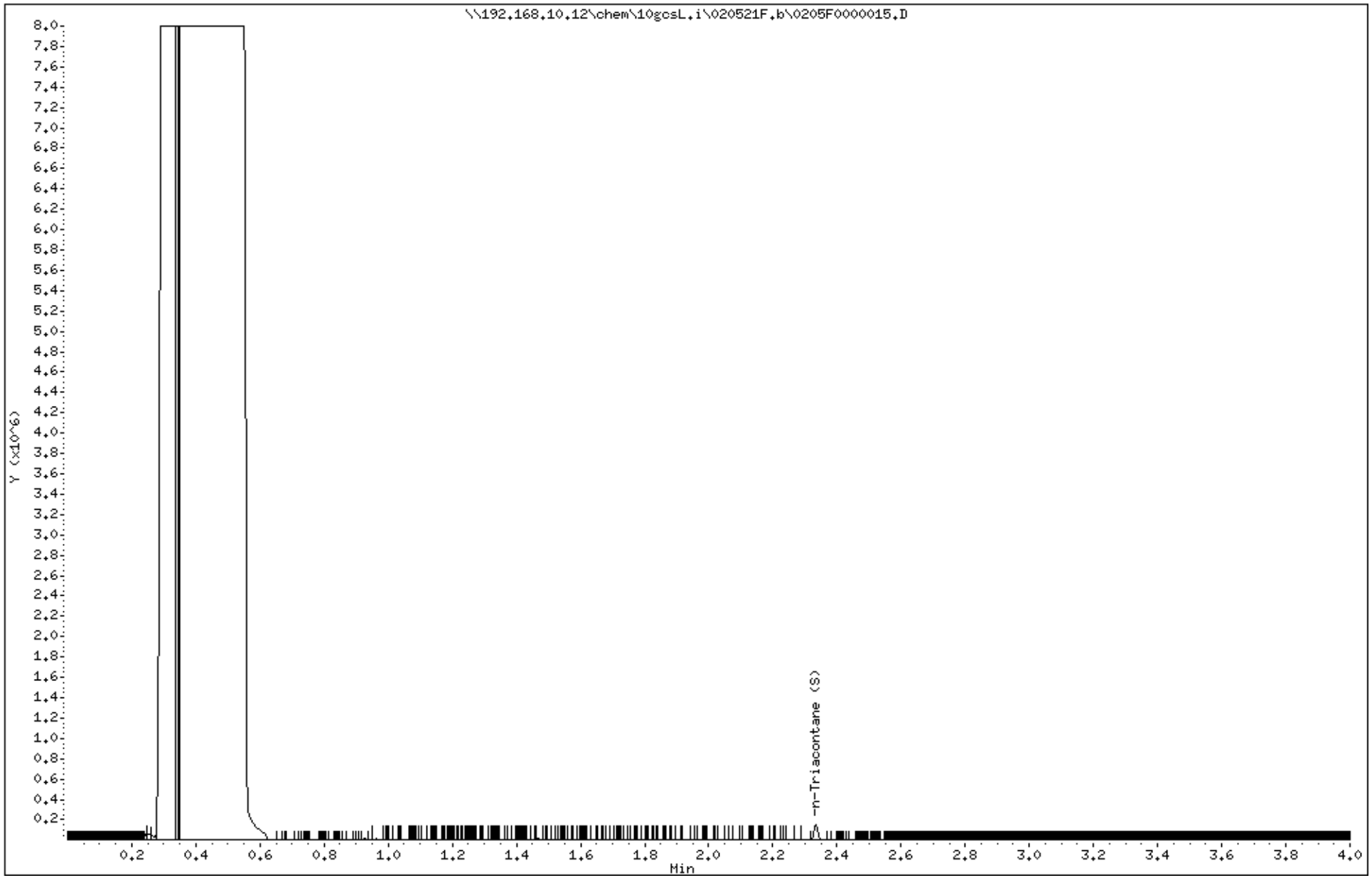
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000014.D
Date : 05-FEB-2021 09:56
Client ID: SW27-MW01
Sample Info: 10546877001
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



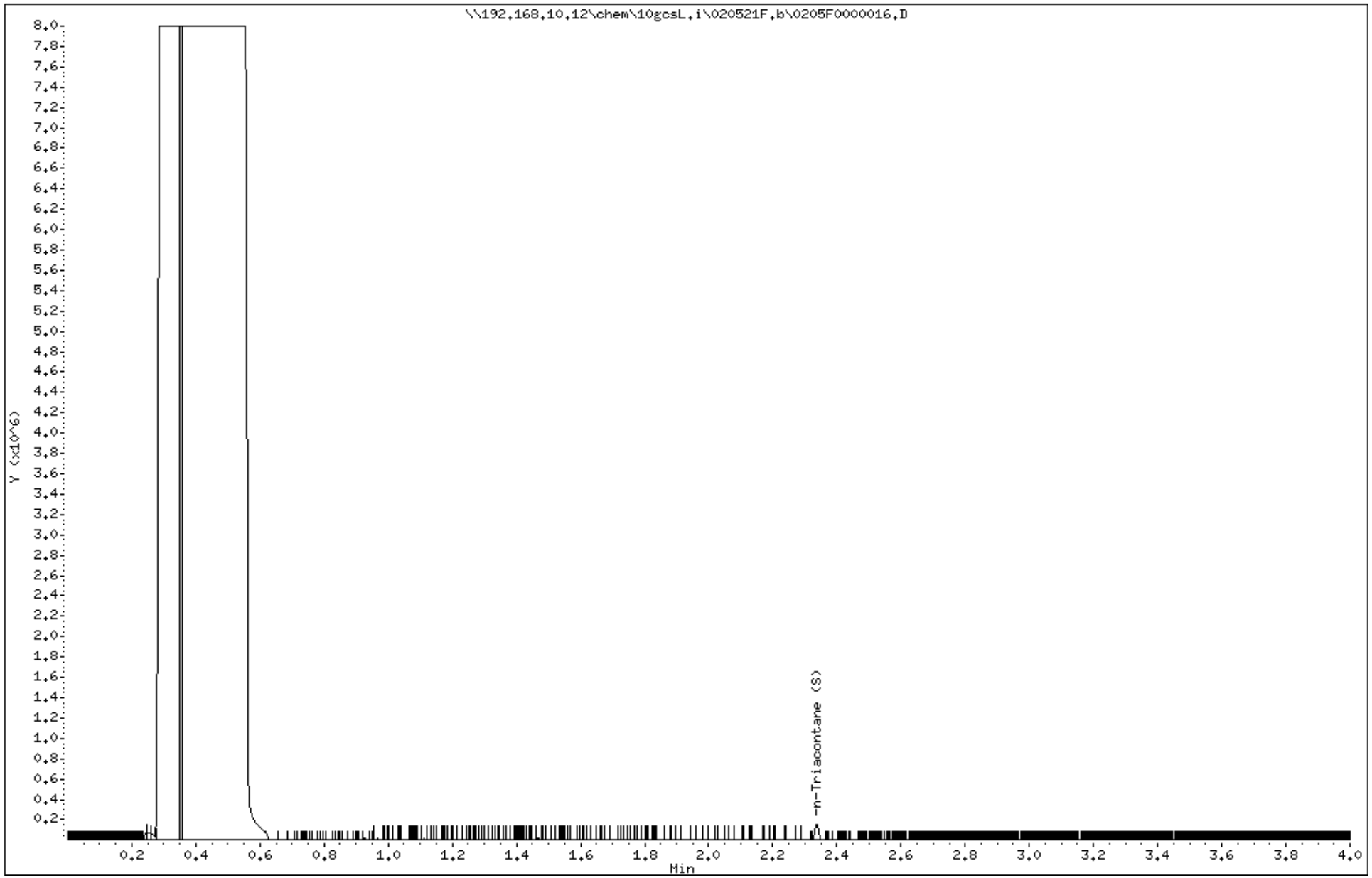
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000015.D
Date : 05-FEB-2021 10:03
Client ID: SW27-MW02
Sample Info: 10546877002
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



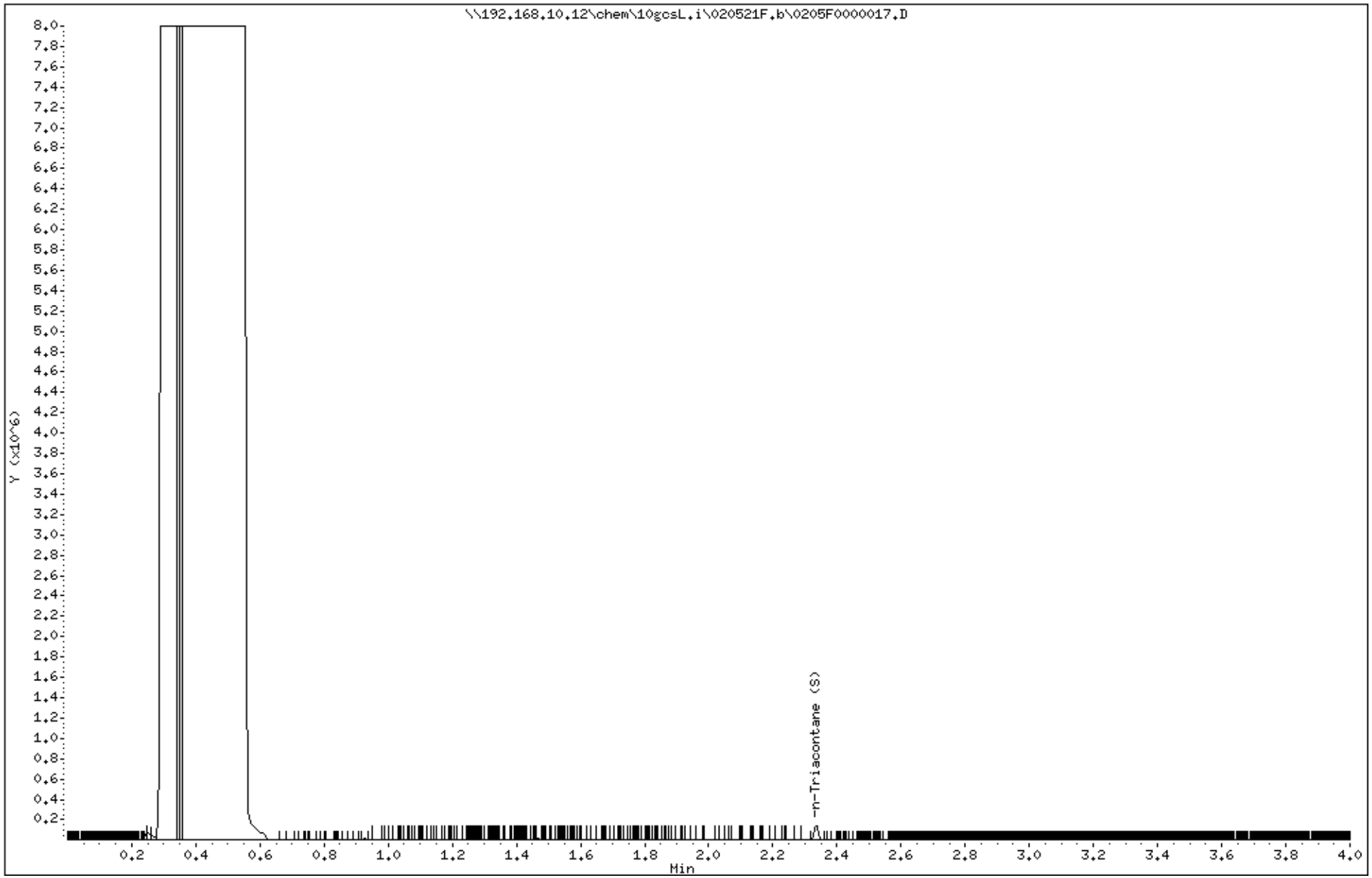
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000016.D
Date : 05-FEB-2021 10:10
Client ID: SW27-MW03
Sample Info: 10546877003
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



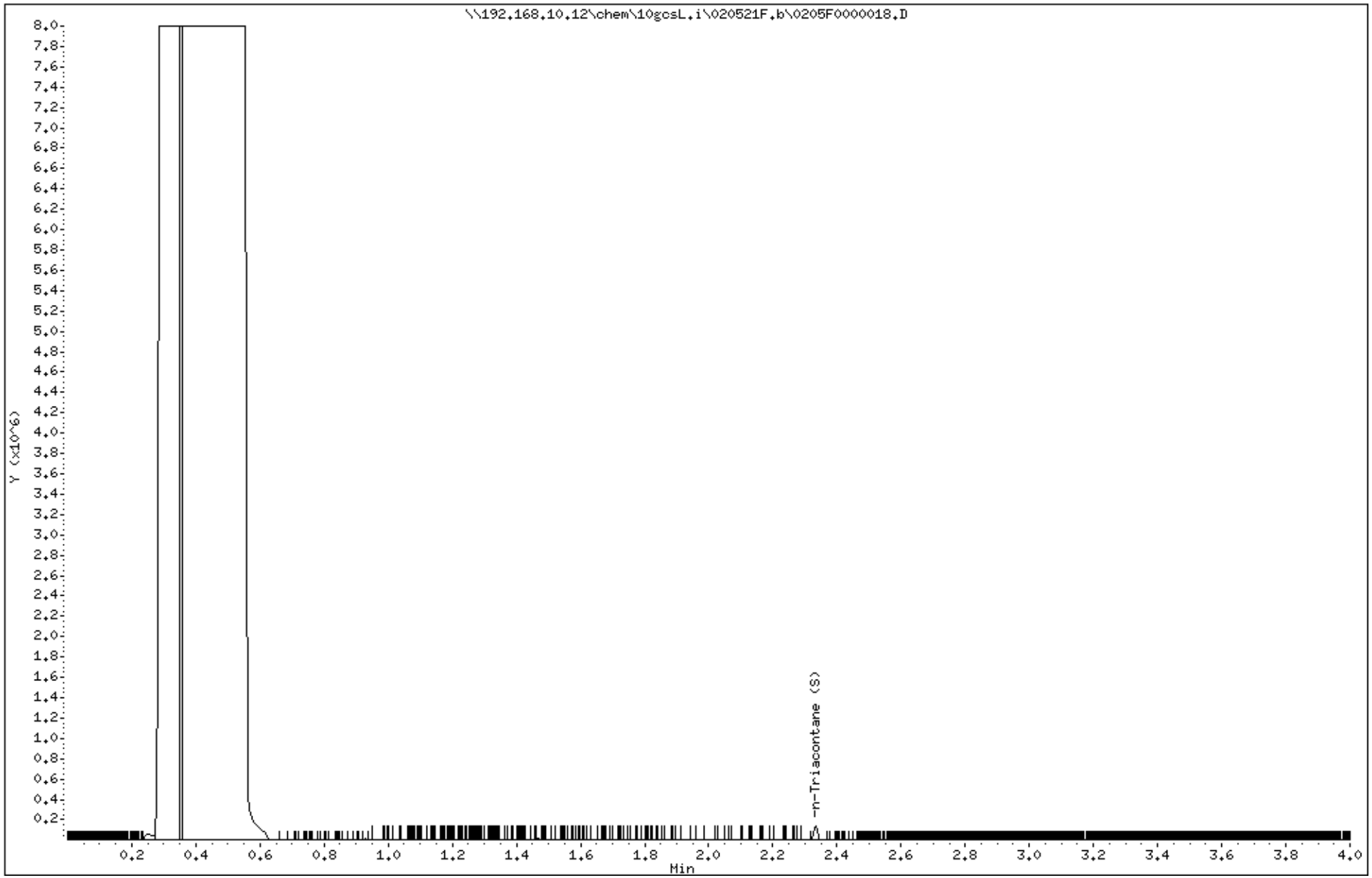
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000017.D
Date : 05-FEB-2021 10:17
Client ID: SW27-MW04
Sample Info: 10546877004
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



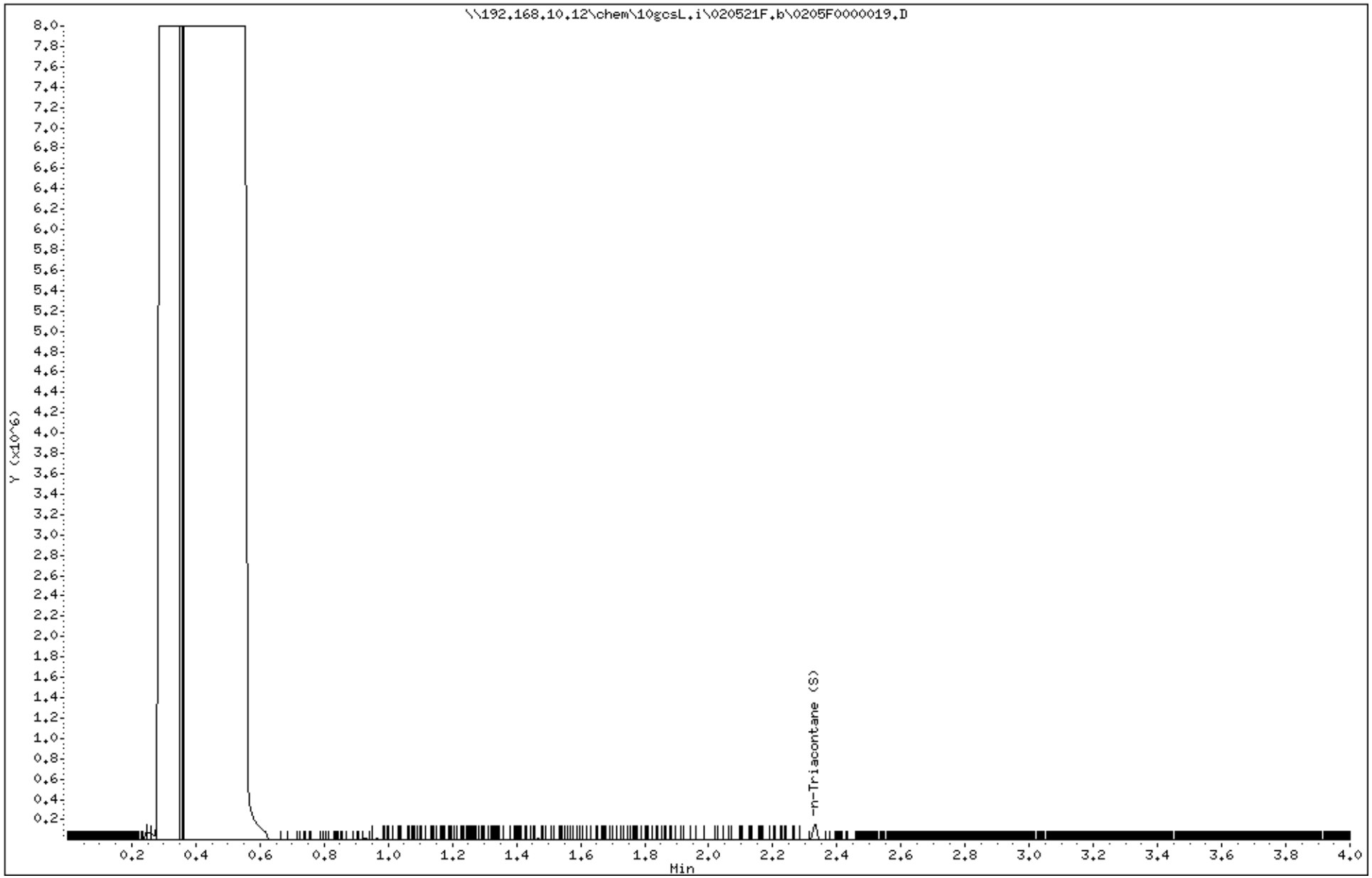
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000018.D
Date : 05-FEB-2021 10:24
Client ID: SW27-MW05
Sample Info: 10546877005
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



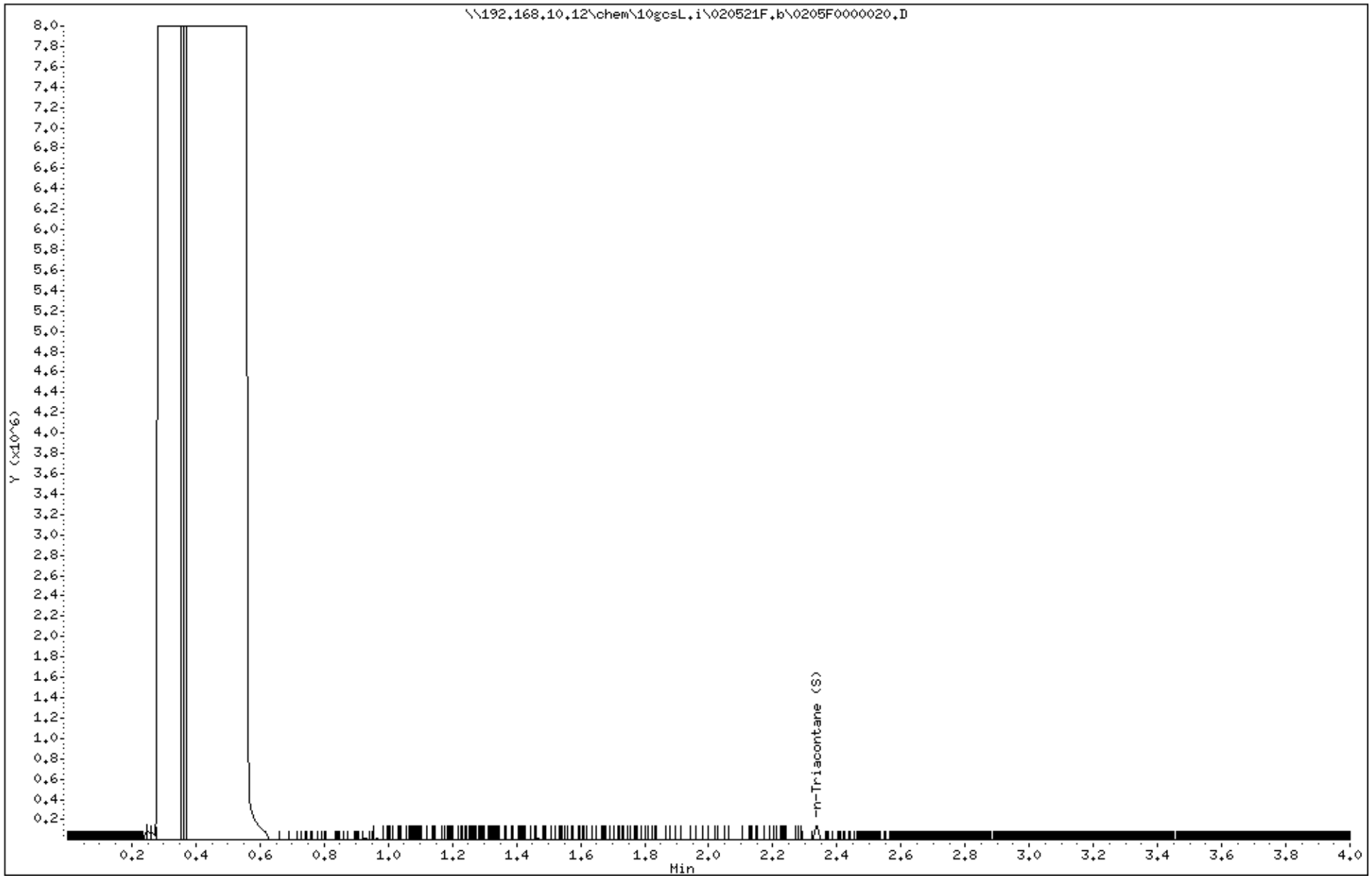
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000019.D
Date : 05-FEB-2021 10:31
Client ID: SW27-MW06
Sample Info: 10546877006
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



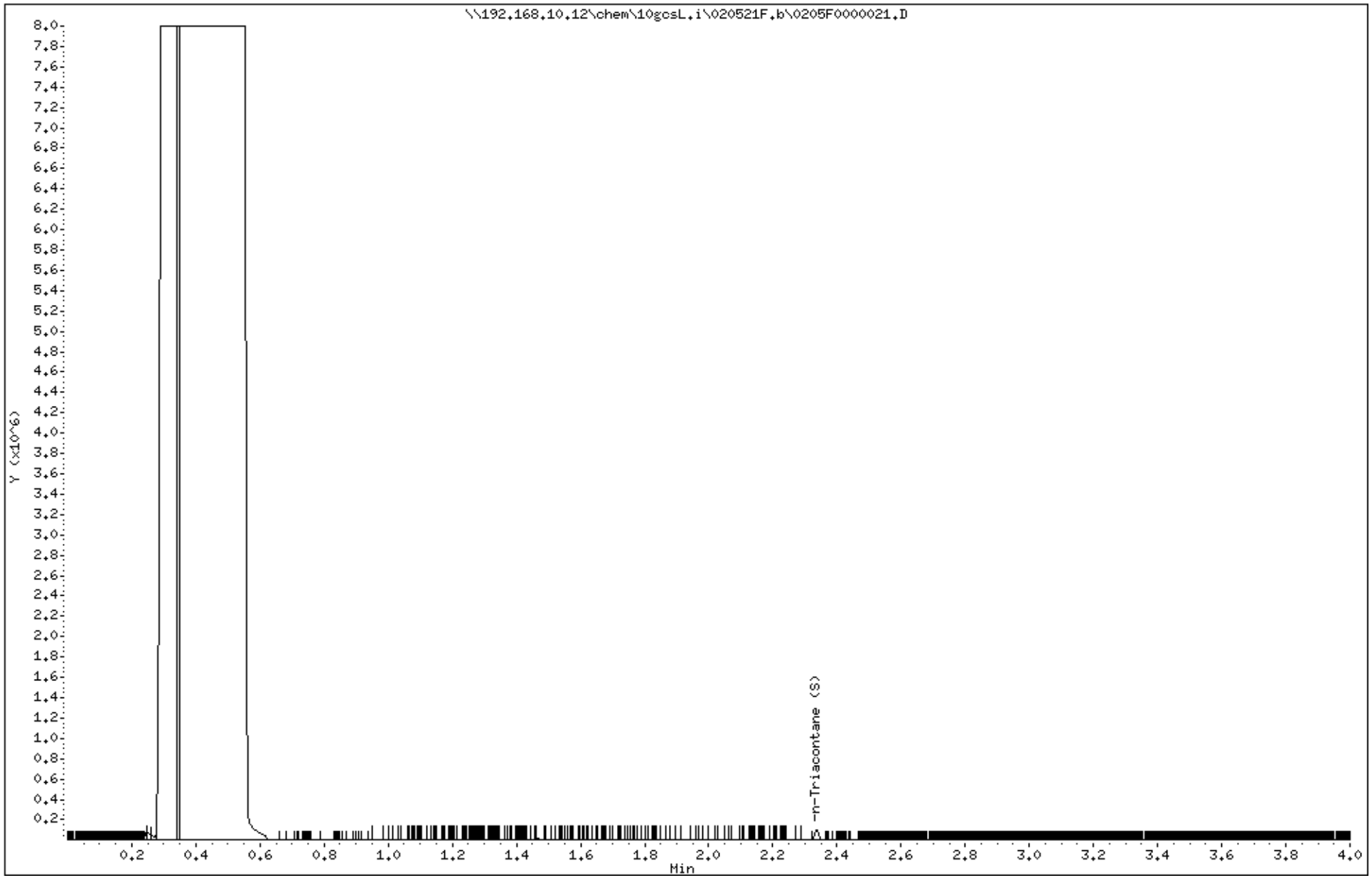
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000020.D
Date : 05-FEB-2021 10:38
Client ID: SW27-MW07
Sample Info: 10546877007
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



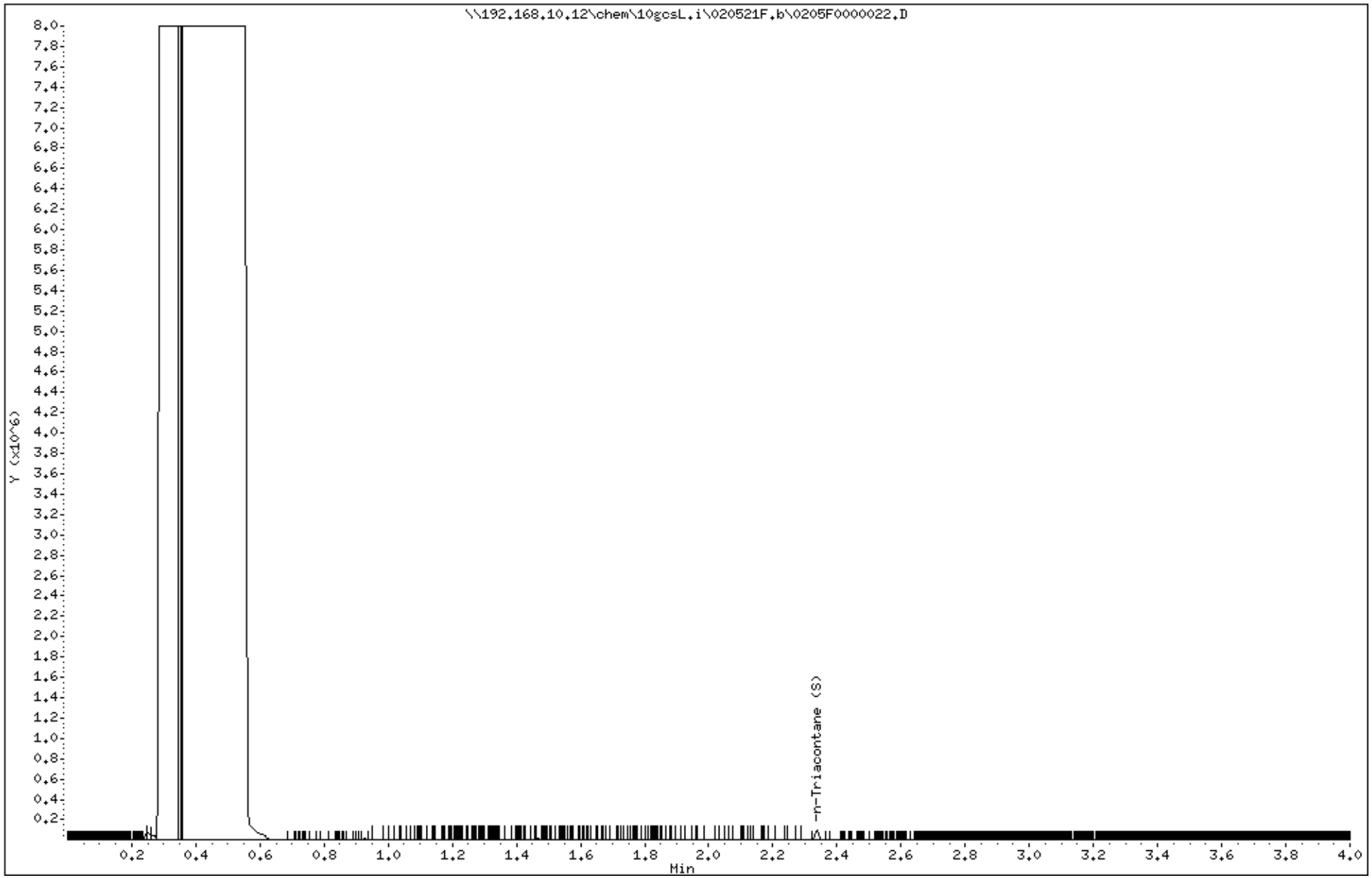
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000021.D
Date : 05-FEB-2021 10:45
Client ID: SW27-MW08
Sample Info: 10546877008
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



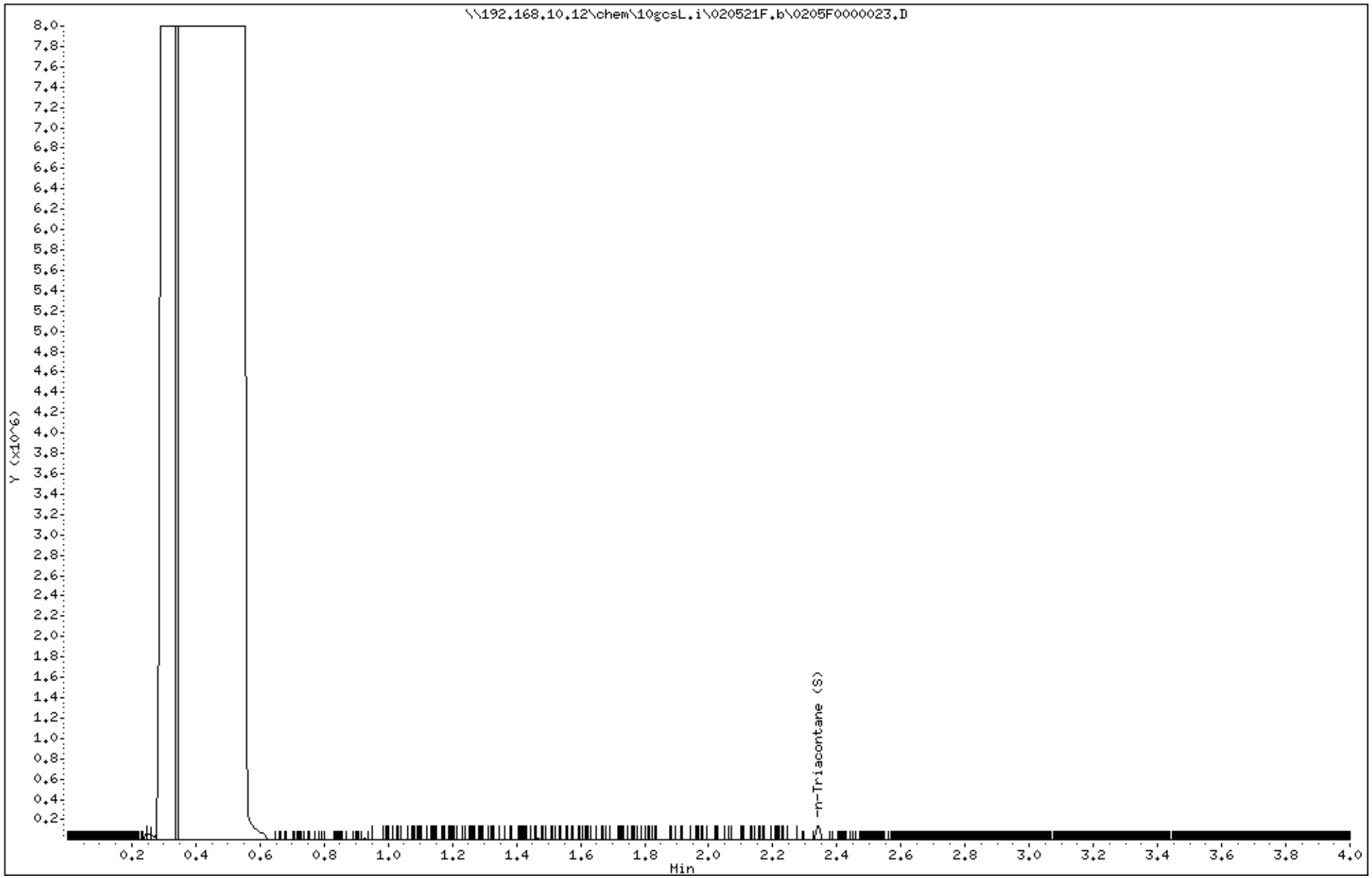
Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000022.D
Date : 05-FEB-2021 10:52
Client ID: SW27-MW02-D
Sample Info: 10546877009
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcsL.i\020521F.b\0205F0000023.D
Date : 05-FEB-2021 10:59
Client ID: SW27-EB01
Sample Info: 10546877010
Volume Injected (uL): 1.0
Column phase: DB-5-US20410007

Instrument: 10gcsL.i
Operator: TT2
Column diameter: 0.32



Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR TCDD

Report Information:

Pace Project #: 10546879
Sample Receipt Date: 02/03/2021
Client Project #: 200402
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Krista Carlson, your Pace Project Manager.

This report has been reviewed by:

February 16, 2021
Krista Carlson, Project Manager

(612) 607-1700 (fax)
krista.carlson@pacelabs.com

Report Prepared Date:
February 16, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analysis performed on ten samples submitted by a representative of BayWest, LLC. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290A. The estimated detection limits (EDLs) were based on signal-to-noise measurements.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 29-89%. Except for one low value, which was flagged "R" on the results table, the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290A. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

Values were flagged "I" where incorrect isotope ratios were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 106-117% with a relative percent difference of 9.9%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Report No.....10546879

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10546879

10546879

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Laboratory Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

Work Order Number	3000027125
Facility Code:	SW-27
Project Task Code:	PRJ07913
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives	Requested Analysis: DRO with silica gel cleanup (WI DRO)	Requested Analysis: 2,3,7,8 TCD (Dioxin) - (EPA 8290A)	Requested Analysis: 1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	Requested Analysis: PFAS	Requested Analysis: Nitrate + Nitrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground	2/2/21	1715	9		X	X	X	X	X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	2/3/21	0958	9		X	X	X	X	X	002
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	2/1/21	1311	9		X	X	X	X	X	003
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	2/3/21	1607	9		X	X	X	X	X	004
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	2/2/21	1506	9		X	X	X	X	X	005
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	2/2/21	1210	9		X	X	X	X	X	006
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	2/3/21	1249	9		X	X	X	X	X	007
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	2/1/21	1622	9		X	X	X	X	X	008
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	2/3/21	1013	9		X	X	X	X	X	009
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	2/3/21	1330	9		X	X	X	X	X	010
11																	
12																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	John Connelly / Bay West	2/3/21	1805	[illegible]	2-3-21	1805	5.5, 3.1, 2.6, 2.0, 1.0, 1.3 (Temp (°C)) / Y / N / Y (Received on Ice (Y/N) / Custody Sealed Cooler (Y/N) / Samples Intact (Y/N))

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: John Connelly

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 2/3/21

Pace Analytical	Document Name: Sample Condition Upon Receipt (SCUR) - MN	Document Revised: 12Aug2020 Page 1 of 1
	Document No.: ENV-FRM-MIN4-0150 Rev.01	Pace Analytical Services - Minneapolis

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10546879

PM: KAC **Due Date: 02/18/21**

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☒Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☐Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☒T5(0489) **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 5.4, 3.2, 1.5, 1.8, 3.9, 9.2

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 5.5, 3.3, 1.6, 2.0, 9.0, 10

Average Corrected Temp (no temp blank only): _____°C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

USDA Regulated Soil: (☒N/A, water sample/Other:_____) **Date/Initials of Person Examining Contents:** MK 2-3-21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (Internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes ☐No	1.
Chain of Custody Relinquished?	☒Yes ☐No	2.
Sampler Name and/or Signature on COC?	☒Yes ☐No ☐N/A	3.
Samples Arrived within Hold Time?	☒Yes ☐No	4.
Short Hold Time Analysis (<72 hr)?	☐Yes ☒No	5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes ☒No	6.
Sufficient Volume?	☒Yes ☐No	7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☐No ☒Yes ☐No	8.
Containers Intact?	☒Yes ☐No	9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes ☐No ☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒Water ☐Soil ☐Oil ☐Other_____	☒Yes ☐No	11. If no, write ID/ Date/Time on Container Below: See Exception ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐Yes ☐No ☒N/A	12. Sample # ☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes ☐No ☒N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes ☐No ☒N/A	Positive for Res. Chlorine? ☐Yes ☐No pH Paper Lot# See Exception ☐ ENV-FRM-MIN4-0142
		Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes ☐No ☒N/A	13. See Exception ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes ☐No ☒N/A	
Trip Blank Present?	☐Yes ☐No ☒N/A	14. Pace Trip Blank Lot # (if purchased):_____
Trip Blank Custody Seals Present?	☐Yes ☐No ☒N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 02/05/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: Ca (3)

Bay West
Customer-Focused Environmental & Industrial Solutions

Lab Order Form

Shipping Information				
BW Project Manager	Erik Nimlos	enimlos@baywest.com	651-291-3493	
BW Proj Chem	Eddie Weaver	Eweaver@baywest.com	651-291-3479	
BW Data Coordinator	Ryan Riley	ryanr@baywest.com	651-485-0776	
Recipient Information	Gerrit Wanderwaal	gvanderwaal@baywest		
Shipping Adress	5 Empire Dr.	St. Paul	MN	55103
Requested Delivery Date	1/27/2021			

Project Information	
Bay West Job Name	SW#27 Vadnais Heights Demo
Bay West Job #	200402
Site Name	SW#27 Vadnais Heights Demo
Site Location (State)	MN
Purchase Order #	205946

Lab Information				
Lab Name	Pace			
Lab Adress	1700 Elm St.	Minneapolis	MN	55414
Lab Project Manager	Colin Lynch			
Lab Phone	612-656-2286			

MPCA Information	
Work Order Number	3000027125
Facility Code	SW-27
Program	Solid Waste Program
Task Code	PRJ07913
Program Code	

Container and Cooler Request

Container Requests

9	1		1	Water	DRO with silica gel cleanup	WI DRO	
9	1		1	Water	2,3,7,8 TCD (Dioxin)	EPA 8290A	
9	1		1	Water	1,4-Dioxane (Analyzed as a single compound)	8270 SIM	
9	1		1	Water	PFAS	MPCA Guidance PFCs	
9	1		1	Water	Gross Alpha		
9	1		1	Water	Nitrate + Nitrite, as Nitrogen	SM 4500 NO3-H	

10546879

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW01		
Lab Sample ID	10546879001		
Filename	U210212A_09		
Injected By	JRH		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/02/2021 17:15
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/12/2021 22:20

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.49	2,3,7,8-TCDD-13C	2.00	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW02		
Lab Sample ID	10546879002		
Filename	U210212A_10		
Injected By	JRH		
Total Amount Extracted	987 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/03/2021 09:58
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/12/2021 23:05

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.55	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	83

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW03		
Lab Sample ID	10546879003		
Filename	U210212A_11		
Injected By	JRH		
Total Amount Extracted	990 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/01/2021 13:11
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/12/2021 23:49

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.37	2,3,7,8-TCDD-13C	2.00	89
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	94

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW04		
Lab Sample ID	10546879004		
Filename	U210212A_12		
Injected By	JRH		
Total Amount Extracted	504 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/03/2021 16:07
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/13/2021 00:34

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	1.5	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	92

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW05		
Lab Sample ID	10546879005		
Filename	U210212A_13		
Injected By	JRH		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/02/2021 15:06
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/13/2021 01:19

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.36	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	84

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW06		
Lab Sample ID	10546879006		
Filename	U210212A_14		
Injected By	JRH		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/02/2021 12:10
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/13/2021 02:04

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	2.1	2,3,7,8-TCDD-13C	2.00	29 R
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	39

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW07		
Lab Sample ID	10546879007		
Filename	U210212A_15		
Injected By	JRH		
Total Amount Extracted	1030 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/03/2021 12:49
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/13/2021 02:49

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.64	2,3,7,8-TCDD-13C	2.00	54
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	89

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW08		
Lab Sample ID	10546879008		
Filename	U210212A_16		
Injected By	JRH		
Total Amount Extracted	954 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/01/2021 16:22
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/13/2021 03:34

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.66	2,3,7,8-TCDD-13C	2.00	85
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	88

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW02-D		
Lab Sample ID	10546879009		
Filename	U210212A_17		
Injected By	JRH		
Total Amount Extracted	1040 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/03/2021 10:13
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/13/2021 04:19

Native Isomers	Conc pg/L	EMPC pg/L	EDL pg/L		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	-----	1.3	0.88	IJ	2,3,7,8-TCDD-13C	2.00	56
					Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
					Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	94

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

J = Estimated value
R = Recovery outside target range
E = Exceeds calibration range
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-EB01		
Lab Sample ID	10546879010		
Filename	U210212A_18		
Injected By	JRH		
Total Amount Extracted	996 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	02/03/2021 13:30
ICAL ID	U210106	Received	02/03/2021 18:05
CCal Filename(s)	U210212A_03 & U210212A_19	Extracted	02/10/2021 11:09
Method Blank ID	BLANK-86948	Analyzed	02/13/2021 05:03

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.61	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Lab Sample Name	DFBLKMA		
Lab Sample ID	BLANK-86948	Matrix	Water
Filename	F210212A_09	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	02/10/2021 11:09
ICAL ID	F210105	Analyzed	02/12/2021 17:17
CCal Filename(s)	F210211B_17 & F210212A_15	Injected By	JRH

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.99	2,3,7,8-TCDD-13C	2.00	85
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	84

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

J = Estimated value
I = Interference present

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCS-86949		
Filename	F210212A_13	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL ID	F210105	Extracted	02/10/2021 11:09
CCal Filename(s)	F210211B_17 & F210212A_15	Analyzed	02/12/2021 20:25
Method Blank ID	BLANK-86948	Injected By	JRH

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.23	117	2,3,7,8-TCDD-13C	2.0	84
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	93

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCSD-86950		
Filename	Y210215A_13	Matrix	Water
Total Amount Extracted	1040 mL	Dilution	NA
ICAL ID	Y201219	Extracted	02/10/2021 11:09
CCal Filename(s)	Y210214B_17 & Y210215A_14	Analyzed	02/15/2021 13:07
Method Blank ID	BLANK-86948	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.21	106	2,3,7,8-TCDD-13C	2.0	75
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	89

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A

Spike Recovery Relative Percent Difference (RPD) Results

Client	Bay West, LLC		
Spike 1 ID	LCS-86949	Spike 2 ID	LCSD-86950
Spike 1 Filename	F210212A_13	Spike 2 Filename	Y210215A_13

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	117	106	9.9

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PFAAs

Report Information:

Pace Project #: 10546882
Sample Receipt Date: 02/03/2021
Client Project #: 200402 SW#27 Vadnais Heights
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Krista Carlson, your Pace Project Manager.

This report has been reviewed by:

February 24, 2021
Krista Carlson, Project Manager

(612) 607-1700 (fax)
krista.carlson@pacelabs.com

Report Prepared Date:
February 23, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

DISCUSSION

This report presents the results from the analyses performed on ten samples submitted by a representative of Bay West Inc. The samples were analyzed for thirty-six perfluorinated compounds using MPCA Guidance. Reporting limits were set to the quantitation limits.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank was free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

Laboratory spike samples were also prepared with the sample batch using clean reference matrix that had been fortified with native standards. The recovery results were within the method limits. The RPDs (relative percent differences) between one designated spike and its duplicate were within the method limits. These spikes indicate that extraction performed as expected.

Diminished internal surrogate standard (IS) recovery (outside the suggested limits) were present in sample material, however, the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard.

The majority of samples had an elevated internal standard recovery (outside the suggested limits) for 13C2_4:2FTS, 13C2_6:2FTS and/or 13C2_8:2FTS flagged ("R"). While the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard, in the case of this FTS compound, the recoveries are anomalously high, and are adversely impacted by matrix. The results for these native compounds should be considered estimated only

The four injection internal standards (13C4 PFOA, 13C4 PFOS, 13C2_PFDA, and 13C2_PFHxA) pass for each analysis in the batch verifying that the instrument detector is working as expected.

Results for selected analytes were taken from secondary dilutions of the sample extracts in order to bring the results within the calibration range. The affected values were flagged "D" on the results tables.

Pace Analytical™

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel:612-607-1700
Fax:612-607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

Report No....1054682_ID36_DFR

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10546882

10546882

01

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information			
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Number	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Colin Lynch	Facility Code:	SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com						

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SO=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives	Requested Analysis: DRO with silica gel cleanup (WI DRO)	Requested Analysis: 2,3,7,8 TCD (Dioxin) - (EPA 8290A)	Requested Analysis: 1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	Requested Analysis: PFAS	Requested Analysis: Nitrate + Nitrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground	2/2/21	1715	9		X	X	X	X	X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	2/3/21	0958	9		X	X	X	X	X	002
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	2/1/21	1311	9		X	X	X	X	X	003
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	2/3/21	1607	9		X	X	X	X	X	004
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	2/2/21	1506	9		X	X	X	X	X	005
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	2/2/21	1210	9		X	X	X	X	X	006
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	2/3/21	1249	9		X	X	X	X	X	007
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	2/1/21	1622	9		X	X	X	X	X	008
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	2/3/21	1013	9		X	X	X	X	X	009
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	2/3/21	1330	9		X	X	X	X	X	010
11																	
12																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	John Connelly / Bay West	2/3/21	1805		2-3-21	1805	5.5, 3.1, 1.6, 2.0, 1.0, 1.3	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: John Connelly

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 2/3/21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 12Aug2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.01**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: **WO#: 10546882**

PM: KAC Due Date: 02/18/21

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☒Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☐Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐T4(0254) ☒T5(0489) **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 5.7, 3.2, 1.5, 1.9, 3.9, 9.2

Correction Factor: +0.1 **Cooler Temp Corrected w/temp blank:** 5.5, 3.3, 1.6, 2.0, 4.0, 10

Average Corrected Temp (no temp blank only): _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

USDA Regulated Soil: (☒N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Date/Initials of Person Examining Contents: MKL 2-3-21

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		8.
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒Water ☐Soil ☐Oil ☐Other_____	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: KCC **Date:** 02/05/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: CA (3)

Bay West
Customer-Focused Environmental & Industrial Solutions

Lab Order Form

Shipping Information	Name	Email	Phone
BW Project Manager	Erik Nimlos	enimlos@baywest.com	651-291-3493
BW Proj Chem	Eddie Weaver	Eweaver@baywest.com	651-291-3479
BW Data Coordinator	Ryan Riley	ryanr@baywest.com	651-485-0776
Recipient Information	Gerrit Wanderwaal	gvanderwaal@baywest	
	Street Adress	City	State / ZIP Code
Shipping Adress	5 Empire Dr.	St. Paul	MN 55103
Requested Delivery Date	1/27/2021		

Project Information	
Bay West Job Name	SW#27 Vadnais Heights Demo
Bay West Job #	200402
Site Name	SW#27 Vadnais Heights Demo
Site Location (State)	MN
Purchase Order #	205946

Lab Information				
Lab Name	Pace			
	Street Address	City	State	ZIP Code
Lab Adress	1700 Elm St.	Minneapolis	MN	55414
Lab Project Manager	Colin Lynch			
Lab Phone	612-656-2286			

MPCA Information	
Work Order Number	3000027125
Facility Code	SW-27
Program	Solid Waste Program
Task Code	PRJ07913
Program Code	

Container and Cooler Request	# of coolers	Comments / Requests

Container Requests

Sample Qty	Bottle Qty	Pre-Qty	Initials	Matrix	Analysis	Method	Comments / Requests
9	1		1	Water	DRO with silica gel cleanup	WI DRO	
9	1		1	Water	2,3,7,8 TCD (Dioxin)	EPA 8290A	
9	1		1	Water	1,4-Dioxane (Analyzed as a single compound)	8270 SIM	
9	1		1	Water	PFAS	MPCA Guidance PFCs	
9	1		1	Water	Gross Alpha		
9	1		1	Water	Nitrate + Nitrite, as Nitrogen	SM 4500 NO3-H	

Pace Analytical™

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel:612-607-1700
Fax:612-607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882001	Total Amount Extracted	498mL
Lab File ID	B210219B_009	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 17:15	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	25	1.0	1.0	0.075	1	375-22-4	
PFPeA	8.9	1.0	1.0	0.050	1	2706-90-3	
HFPO-DA	ND	1.0	1.0	0.047	1	13252-13-6	
PFBS	8.0	0.89	0.89	0.051	1	375-73-5	
PFHxA	14	1.0	1.0	0.056	1	307-24-4	
4:2 FTS	ND	0.94	0.94	0.075	1	757124-72-4	
PFPeS	8.1	0.94	0.94	0.059	1	2706-91-4	
PFHpA	5.3	1.0	1.0	0.069	1	375-85-9	
DONA	ND	0.95	0.95	0.060	1	919005-14-4	
PFHxS	160 D	4.6	4.6	0.39	10	355-46-4	
PFOA	21	1.0	1.0	0.045	1	335-67-1	
6:2 FTS	ND	0.95	0.95	0.078	1	27619-97-2	
PFHpS	3.8	0.95	0.95	0.059	1	375-92-8	
PFNA	ND	1.0	1.0	0.046	1	375-95-1	
PFOSAm	ND	1.0	1.0	0.054	1	754-91-6	
PFOS	230 D	4.6	4.6	0.46	10	1763-23-1	
MeFOSA	ND	1.0	1.0	0.081	1	31506-32-8	
PFDA	ND	1.0	1.0	0.060	1	335-76-2	
EtFOSAm	ND	1.0	1.0	0.076	1	4151-50-2	
8:2 FTS	ND	0.96	0.96	0.078	1	39108-34-4	
9-Cl-PF3ON	ND	0.93	0.93	0.069	1	756426-58-1	
PFNS	ND	0.96	0.96	0.054	1	68259-12-1	
PFUnDA	ND	1.0	1.0	0.083	1	2058-94-8	
NMeFOSAA	ND	1.0	1.0	0.072	1	2355-31-9	
NEtFOSAA	ND	1.0	1.0	0.067	1	2991-50-6	
PFDS	ND	0.97	0.97	0.058	1	335-77-3	
PFDOA	ND	1.0	1.0	0.081	1	307-55-1	
MeFOSE	ND	1.0	1.0	0.054	1	24448-09-7	
10:2 FTS	ND	0.97	0.97	0.064	1	120226-60-0	
EtFOSE	ND	1.0	1.0	0.069	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.94	0.94	0.061	1	763051-92-9	
PFTrDA	ND	1.0	1.0	0.082	1	72629-94-8	
PFDoS	ND	0.97	0.97	0.063	1	79780-39-5	
PFTDA	ND	1.0	1.0	0.041	1	376-06-7	
PFHXDA	ND	1.0	1.0	0.063	1	67905-19-5	
PFODA	ND	1.0	1.0	0.082	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882001	Total Amount Extracted	498mL
Lab File ID	B210219B_009	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 17:15	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	11	108	50-200	
13C4_PFOA	10	12	123	50-200	
13C2_PFDA	10	15	152	50-200	
13C4_PFOS	9.6	12	130	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	6.6	66	50-200	
13C5_PFPeA	10	8.0	80	50-200	
13C3_PFBS	9.3	12	133	50-200	
13C2_4:2FTS	9.4	49	**518**	50-200	R
13C5_PFHxA	10	12	117	50-200	
13C4_PFHpA	10	13	134	50-200	
13C3_PFHxS	9.5	12	128	50-200	
13C2_6:2FTS	9.5	42	**437**	50-200	R
13C8_PFOA	10	14	140	50-200	
13C9_PFNA	10	15	145	50-200	
13C8_PFOS	9.6	12	125	50-200	
13C2_8:2FTS	9.6	26	**272**	50-200	R
13C6_PFDA	10	15	148	50-200	
d3-MeFOSAA	10	19	186	50-200	
13C8_PFOSA	10	11	110	50-200	
d5-EtFOSAA	10	17	173	50-200	
13C7_PFUdA	10	16	159	50-200	
13C2_PFDoA	10	14	140	50-200	
13C2_PFTeDA	10	13	127	50-200	
13C3_HFPO-DA	10	8.8	88	50-200	
13C2_PFHxDA	10	11	114	50-200	
d7-N-MeFOSE	10	11	107	50-200	
d9-N-EtFOSE	10	11	106	50-200	
d3-N-MeFOSA	10	7.8	78	50-200	
d5-N-EtFOSA	10	7.5	74	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882001	Total Amount Extracted	498mL
Lab File ID	B210219B_009	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 17:15	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.03	6.03	
13C4_PFOA	N/A	N/A	7.44	7.48	
13C2_PFDA	N/A	N/A	9.00	9.07	
13C4_PFOS	N/A	N/A	9.54	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.74	4.73	
13C5_PFPeA	N/A	N/A	5.43	5.42	
13C3_PFBS	N/A	N/A	6.28	6.29	
13C2_4:2FTS	N/A	N/A	5.77	5.77	R
13C5_PFHxA	N/A	N/A	6.03	6.03	
13C4_PFHpA	N/A	N/A	6.71	6.73	
13C3_PFHxS	N/A	N/A	7.88	7.94	
13C2_6:2FTS	N/A	N/A	7.06	7.10	R
13C8_PFOA	N/A	N/A	7.44	7.48	
13C9_PFNA	N/A	N/A	8.21	8.25	
13C8_PFOS	N/A	N/A	9.54	9.61	
13C2_8:2FTS	N/A	N/A	8.57	8.61	R
13C6_PFDA	N/A	N/A	9.00	9.06	
d3-MeFOSAA	N/A	N/A	8.91	8.97	
13C8_PFOSA	N/A	N/A	12.50	12.53	
d5-EtFOSAA	N/A	N/A	9.28	9.33	
13C7_PFUdA	N/A	N/A	9.82	9.87	
13C2_PFDoA	N/A	N/A	10.65	10.69	
13C2_PFTeDA	N/A	N/A	12.32	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.86	13.81	
d7-N-MeFOSE	N/A	N/A	14.88	14.84	
d9-N-EtFOSE	N/A	N/A	15.59	15.55	
d3-N-MeFOSA	N/A	N/A	15.20	15.16	
d5-N-EtFOSA	N/A	N/A	15.85	15.82	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882001	Total Amount Extracted	498mL
Lab File ID	B210219B_009	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 17:15	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.75	4.76	
PFPeA	N/A	N/A	5.44	5.43	
HFPO-DA	0.000	0.300	6.32	6.31	
PFBS	0.370	0.370	6.28	6.29	
PFHxA	0.110	0.140	6.04	6.04	
4:2 FTS	0.000	1.10	5.78	5.77	
PFPeS	0.380	0.350	7.07	7.11	
PFHpA	0.410	0.490	6.72	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.300	0.290	8.00	7.91	D
PFOA	0.560	0.580	7.44	7.48	
6:2 FTS	1.10	1.20	7.07	7.10	
PFHpS	0.240	0.230	8.72	8.78	
PFNA	0.400	0.480	8.21	8.26	
PFOSAm	N/A	N/A	12.49	12.54	
PFOS	0.180	0.210	9.59	9.40	D
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	0.00	9.07	
EtFOSAm	0.000	0.550	0.00	15.84	
8:2 FTS	2.40	1.20	8.55	8.62	
9-Cl-PF3ON	0.000	0.0370	10.12	10.21	
PFNS	0.000	0.370	0.00	10.44	
PFUnDA	0.000	0.210	0.00	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	0.000	0.280	0.00	11.26	
PFDOA	0.920	0.390	10.66	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.000	0.220	0.00	12.81	
PFTDA	0.350	0.300	12.33	12.32	
PFHXDA	0.230	0.190	13.87	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882002	Total Amount Extracted	485mL
Lab File ID	B210219B_010	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 09:58	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	88	1.0	1.0	0.077	1	375-22-4	
PFPeA	13	1.0	1.0	0.051	1	2706-90-3	
HFPO-DA	ND	1.0	1.0	0.048	1	13252-13-6	
PFBS	2.9	0.91	0.91	0.053	1	375-73-5	
PFHxA	7.1	1.0	1.0	0.058	1	307-24-4	
4:2 FTS	ND	0.96	0.96	0.077	1	757124-72-4	
PFPeS	ND	0.97	0.97	0.060	1	2706-91-4	
PFHpA	2.7	1.0	1.0	0.071	1	375-85-9	
DONA	ND	0.97	0.97	0.062	1	919005-14-4	
PFHxS	1.1	0.94	0.94	0.040	1	355-46-4	
PFOA	11	1.0	1.0	0.046	1	335-67-1	
6:2 FTS	ND	0.98	0.98	0.080	1	27619-97-2	
PFHpS	ND	0.98	0.98	0.061	1	375-92-8	
PFNA	ND	1.0	1.0	0.047	1	375-95-1	
PFOSAm	ND	1.0	1.0	0.056	1	754-91-6	
PFOS	0.99	0.95	0.95	0.047	1	1763-23-1	
MeFOSA	ND	1.0	1.0	0.083	1	31506-32-8	
PFDA	ND	1.0	1.0	0.062	1	335-76-2	
EtFOSAm	ND	1.0	1.0	0.078	1	4151-50-2	
8:2 FTS	ND	0.99	0.99	0.080	1	39108-34-4	
9-Cl-PF3ON	ND	0.96	0.96	0.071	1	756426-58-1	
PFNS	ND	0.99	0.99	0.056	1	68259-12-1	
PFUnDA	ND	1.0	1.0	0.085	1	2058-94-8	
NMeFOSAA	ND	1.0	1.0	0.074	1	2355-31-9	
NEtFOSAA	ND	1.0	1.0	0.069	1	2991-50-6	
PFDS	ND	0.99	0.99	0.060	1	335-77-3	
PFDOA	ND	1.0	1.0	0.083	1	307-55-1	
MeFOSE	ND	1.0	1.0	0.056	1	24448-09-7	
10:2 FTS	ND	0.99	0.99	0.065	1	120226-60-0	
EtFOSE	ND	1.0	1.0	0.071	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.97	0.97	0.062	1	763051-92-9	
PFTrDA	ND	1.0	1.0	0.084	1	72629-94-8	
PFDoS	ND	1.00	1.00	0.065	1	79780-39-5	
PFTDA	ND	1.0	1.0	0.042	1	376-06-7	
PFHXDA	ND	1.0	1.0	0.064	1	67905-19-5	
PFODA	ND	1.0	1.0	0.084	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882002	Total Amount Extracted	485mL
Lab File ID	B210219B_010	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 09:58	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	9.7	95	50-200	
13C4_PFOA	10	12	112	50-200	
13C2_PFDA	10	14	139	50-200	
13C4_PFOS	9.9	13	129	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	5.9	57	50-200	
13C5_PFPeA	10	7.7	74	50-200	
13C3_PFBS	9.6	11	114	50-200	
13C2_4:2FTS	9.6	44	**454**	50-200	R
13C5_PFHxA	10	11	108	50-200	
13C4_PFHpA	10	13	126	50-200	
13C3_PFHxS	9.7	12	122	50-200	
13C2_6:2FTS	9.8	44	**451**	50-200	R
13C8_PFOA	10	14	132	50-200	
13C9_PFNA	10	14	136	50-200	
13C8_PFOS	9.9	12	122	50-200	
13C2_8:2FTS	9.9	25	**254**	50-200	R
13C6_PFDA	10	13	124	50-200	
d3-MeFOSAA	10	18	173	50-200	
13C8_PFOSA	10	9.5	92	50-200	
d5-EtFOSAA	10	17	166	50-200	
13C7_PFUdA	10	16	154	50-200	
13C2_PFDoA	10	14	135	50-200	
13C2_PFTeDA	10	12	112	50-200	
13C3_HFPO-DA	10	8.6	84	50-200	
13C2_PFHxDA	10	9.0	87	50-200	
d7-N-MeFOSE	10	5.1	**49**	50-200	R
d9-N-EtFOSE	10	5.3	52	50-200	
d3-N-MeFOSA	10	0.30	**3**	50-200	R
d5-N-EtFOSA	10	0.30	**3**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882002	Total Amount Extracted	485mL
Lab File ID	B210219B_010	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 09:58	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.05	6.03	
13C4_PFOA	N/A	N/A	7.47	7.48	
13C2_PFDA	N/A	N/A	9.04	9.07	
13C4_PFOS	N/A	N/A	9.57	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.75	4.73	
13C5_PFPeA	N/A	N/A	5.44	5.42	
13C3_PFBS	N/A	N/A	6.30	6.29	
13C2_4:2FTS	N/A	N/A	5.79	5.77	R
13C5_PFHxA	N/A	N/A	6.05	6.03	
13C4_PFHpA	N/A	N/A	6.74	6.73	
13C3_PFHxS	N/A	N/A	7.92	7.94	
13C2_6:2FTS	N/A	N/A	7.10	7.10	R
13C8_PFOA	N/A	N/A	7.47	7.48	
13C9_PFNA	N/A	N/A	8.24	8.25	
13C8_PFOS	N/A	N/A	9.57	9.61	
13C2_8:2FTS	N/A	N/A	8.60	8.61	R
13C6_PFDA	N/A	N/A	9.04	9.06	
d3-MeFOSAA	N/A	N/A	8.94	8.97	
13C8_PFOSA	N/A	N/A	12.46	12.53	
d5-EtFOSAA	N/A	N/A	9.31	9.33	
13C7_PFUdA	N/A	N/A	9.84	9.87	
13C2_PFDoA	N/A	N/A	10.64	10.69	
13C2_PFTeDA	N/A	N/A	12.25	12.30	
13C3_HFPO-DA	N/A	N/A	6.32	6.30	
13C2_PFHxDA	N/A	N/A	13.72	13.81	
d7-N-MeFOSE	N/A	N/A	14.72	14.84	R
d9-N-EtFOSE	N/A	N/A	15.41	15.55	
d3-N-MeFOSA	N/A	N/A	15.04	15.16	R
d5-N-EtFOSA	N/A	N/A	15.68	15.82	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882002	Total Amount Extracted	485mL
Lab File ID	B210219B_010	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 09:58	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.75	4.76	
PFPeA	N/A	N/A	5.45	5.43	
HFPO-DA	0.000	0.300	6.32	6.31	
PFBS	0.360	0.370	6.31	6.29	
PFHxA	0.120	0.140	6.05	6.04	
4:2 FTS	0.000	1.10	5.79	5.77	
PFPeS	0.360	0.350	7.11	7.11	
PFHpA	0.510	0.490	6.74	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.270	0.300	7.93	7.91	
PFOA	0.590	0.580	7.48	7.48	
6:2 FTS	1.20	1.20	7.10	7.10	
PFHpS	0.000	0.230	8.75	8.78	
PFNA	0.260	0.480	8.25	8.26	
PFOSAm	N/A	N/A	12.46	12.54	
PFOS	0.150	0.230	9.25	9.40	
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.120	0.260	9.01	9.07	
EtFOSAm	0.000	0.550	0.00	15.84	
8:2 FTS	0.000	1.20	8.65	8.62	
9-Cl-PF3ON	0.000	0.0370	10.19	10.21	
PFNS	0.000	0.370	0.00	10.44	
PFUnDA	0.000	0.210	9.83	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	0.000	0.280	11.19	11.26	
PFDOA	0.000	0.390	0.00	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.310	0.220	12.75	12.81	
PFTDA	0.000	0.300	0.00	12.32	
PFHXDA	0.140	0.190	13.73	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882003	Total Amount Extracted	496mL
Lab File ID	B210219B_011	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 13:11	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	43	1.0	1.0	0.076	1	375-22-4	
PFPeA	11	1.0	1.0	0.050	1	2706-90-3	
HFPO-DA	ND	1.0	1.0	0.047	1	13252-13-6	
PFBS	17	0.89	0.89	0.051	1	375-73-5	
PFHxA	35	1.0	1.0	0.056	1	307-24-4	
4:2 FTS	ND	0.94	0.94	0.075	1	757124-72-4	
PFPeS	11	0.95	0.95	0.059	1	2706-91-4	
PFHpA	9.7	1.0	1.0	0.070	1	375-85-9	
DONA	ND	0.95	0.95	0.060	1	919005-14-4	
PFHxS	110 D	4.6	4.6	0.39	10	355-46-4	
PFOA	61	1.0	1.0	0.045	1	335-67-1	
6:2 FTS	ND	0.96	0.96	0.079	1	27619-97-2	
PFHpS	ND	0.96	0.96	0.059	1	375-92-8	
PFNA	ND	1.0	1.0	0.046	1	375-95-1	
PFOSAm	ND	1.0	1.0	0.054	1	754-91-6	
PFOS	1.9	0.93	0.93	0.046	1	1763-23-1	
MeFOSA	ND	1.0	1.0	0.081	1	31506-32-8	
PFDA	ND	1.0	1.0	0.060	1	335-76-2	
EtFOSAm	ND	1.0	1.0	0.076	1	4151-50-2	
8:2 FTS	ND	0.97	0.97	0.079	1	39108-34-4	
9-Cl-PF3ON	ND	0.94	0.94	0.069	1	756426-58-1	
PFNS	ND	0.97	0.97	0.054	1	68259-12-1	
PFUnDA	ND	1.0	1.0	0.084	1	2058-94-8	
NMeFOSAA	ND	1.0	1.0	0.073	1	2355-31-9	
NEtFOSAA	ND	1.0	1.0	0.068	1	2991-50-6	
PFDS	ND	0.97	0.97	0.058	1	335-77-3	
PFDOA	ND	1.0	1.0	0.082	1	307-55-1	
MeFOSE	ND	1.0	1.0	0.054	1	24448-09-7	
10:2 FTS	ND	0.97	0.97	0.064	1	120226-60-0	
EtFOSE	ND	1.0	1.0	0.069	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.95	0.95	0.061	1	763051-92-9	
PFTrDA	ND	1.0	1.0	0.082	1	72629-94-8	
PFDoS	ND	0.98	0.98	0.064	1	79780-39-5	
PFTDA	ND	1.0	1.0	0.042	1	376-06-7	
PFHXDA	ND	1.0	1.0	0.063	1	67905-19-5	
PFODA	ND	1.0	1.0	0.083	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882003	Total Amount Extracted	496mL
Lab File ID	B210219B_011	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 13:11	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	7.3	72	50-200	
13C4_PFOA	10	9.7	97	50-200	
13C2_PFDA	10	13	132	50-200	
13C4_PFOS	9.6	13	131	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	2.9	**29**	50-200	R
13C5_PFPeA	10	4.6	**46**	50-200	R
13C3_PFBS	9.4	9.8	104	50-200	
13C2_4:2FTS	9.4	48	**507**	50-200	R
13C5_PFHxA	10	7.7	76	50-200	
13C4_PFHpA	10	10	100	50-200	
13C3_PFHxS	9.5	11	115	50-200	
13C2_6:2FTS	9.6	65	**676**	50-200	R
13C8_PFOA	10	11	112	50-200	
13C9_PFNA	10	13	128	50-200	
13C8_PFOS	9.6	11	118	50-200	
13C2_8:2FTS	9.7	54	**557**	50-200	R
13C6_PFDA	10	14	142	50-200	
d3-MeFOSAA	10	18	182	50-200	
13C8_PFOSA	10	10.0	99	50-200	
d5-EtFOSAA	10	23	**224**	50-200	R
13C7_PFUdA	10	15	147	50-200	
13C2_PFDoA	10	14	135	50-200	
13C2_PFTeDA	10	14	135	50-200	
13C3_HFPO-DA	10	5.6	56	50-200	
13C2_PFHxDA	10	8.5	84	50-200	
d7-N-MeFOSE	10	1.6	**16**	50-200	R
d9-N-EtFOSE	10	1.6	**16**	50-200	R
d3-N-MeFOSA	10	0.018	**0**	50-200	R
d5-N-EtFOSA	10	0.0076	**0**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882003	Total Amount Extracted	496mL
Lab File ID	B210219B_011	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 13:11	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.03	6.03	
13C4_PFOA	N/A	N/A	7.48	7.48	
13C2_PFDA	N/A	N/A	9.04	9.07	
13C4_PFOS	N/A	N/A	9.57	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.72	4.73	R
13C5_PFPeA	N/A	N/A	5.42	5.42	R
13C3_PFBS	N/A	N/A	6.29	6.29	
13C2_4:2FTS	N/A	N/A	5.77	5.77	R
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.73	6.73	
13C3_PFHxS	N/A	N/A	7.92	7.94	
13C2_6:2FTS	N/A	N/A	7.10	7.10	R
13C8_PFOA	N/A	N/A	7.48	7.48	
13C9_PFNA	N/A	N/A	8.25	8.25	
13C8_PFOS	N/A	N/A	9.58	9.61	
13C2_8:2FTS	N/A	N/A	8.60	8.61	R
13C6_PFDA	N/A	N/A	9.04	9.06	
d3-MeFOSAA	N/A	N/A	8.95	8.97	
13C8_PFOSA	N/A	N/A	12.49	12.53	
d5-EtFOSAA	N/A	N/A	9.32	9.33	R
13C7_PFUdA	N/A	N/A	9.85	9.87	
13C2_PFDoA	N/A	N/A	10.68	10.69	
13C2_PFTeDA	N/A	N/A	12.30	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.73	13.81	
d7-N-MeFOSE	N/A	N/A	14.73	14.84	R
d9-N-EtFOSE	N/A	N/A	15.41	15.55	R
d3-N-MeFOSA	N/A	N/A	15.03	15.16	R
d5-N-EtFOSA	N/A	N/A	15.72	15.82	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882003	Total Amount Extracted	496mL
Lab File ID	B210219B_011	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 13:11	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.72	4.76	
PFPeA	N/A	N/A	5.42	5.43	
HFPO-DA	0.000	0.300	6.32	6.31	
PFBS	0.360	0.370	6.29	6.29	
PFHxA	0.110	0.140	6.04	6.04	
4:2 FTS	0.000	1.10	5.78	5.77	
PFPeS	0.360	0.350	7.10	7.11	
PFHpA	0.420	0.490	6.74	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.280	0.290	7.94	7.91	D
PFOA	0.540	0.580	7.48	7.48	
6:2 FTS	0.000	1.20	7.09	7.10	
PFHpS	0.240	0.230	8.75	8.78	
PFNA	0.360	0.480	8.26	8.26	
PFOSAm	N/A	N/A	12.48	12.54	
PFOS	0.130	0.230	9.25	9.40	
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	0.00	9.07	
EtFOSAm	0.000	0.550	0.00	15.84	
8:2 FTS	0.000	1.20	8.62	8.62	
9-Cl-PF3ON	0.000	0.0370	0.00	10.21	
PFNS	0.000	0.370	0.00	10.44	
PFUnDA	0.000	0.210	0.00	9.88	
NMeFOSAA	0.000	0.580	8.93	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	0.000	0.280	11.21	11.26	
PFDOA	0.000	0.390	0.00	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.670	0.220	12.77	12.81	
PFTDA	0.000	0.300	0.00	12.32	
PFHXDA	0.000	0.190	13.74	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882004	Total Amount Extracted	482mL
Lab File ID	B210219B_012	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 16:07	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	15	1.0	1.0	0.078	1	375-22-4	
PFPeA	1.6	1.0	1.0	0.051	1	2706-90-3	
HFPO-DA	ND	1.0	1.0	0.049	1	13252-13-6	
PFBS	7.0	0.92	0.92	0.053	1	375-73-5	
PFHxA	1.7	1.0	1.0	0.058	1	307-24-4	
4:2 FTS	ND	0.97	0.97	0.077	1	757124-72-4	
PFPeS	2.0	0.98	0.98	0.061	1	2706-91-4	
PFHpA	ND	1.0	1.0	0.072	1	375-85-9	
DONA	ND	0.98	0.98	0.062	1	919005-14-4	
PFHxS	4.6	0.94	0.94	0.040	1	355-46-4	
PFOA	5.2	1.0	1.0	0.046	1	335-67-1	
6:2 FTS	ND	0.99	0.99	0.081	1	27619-97-2	
PFHpS	ND	0.99	0.99	0.061	1	375-92-8	
PFNA	ND	1.0	1.0	0.047	1	375-95-1	
PFOSAm	ND	1.0	1.0	0.056	1	754-91-6	
PFOS	7.0 I	0.96	0.96	0.047	1	1763-23-1	
MeFOSA	ND	1.0	1.0	0.084	1	31506-32-8	
PFDA	ND	1.0	1.0	0.062	1	335-76-2	
EtFOSAm	ND	1.0	1.0	0.078	1	4151-50-2	
8:2 FTS	ND	1.00	1.00	0.081	1	39108-34-4	
9-Cl-PF3ON	ND	0.97	0.97	0.071	1	756426-58-1	
PFNS	ND	1.00	1.00	0.056	1	68259-12-1	
PFUnDA	ND	1.0	1.0	0.086	1	2058-94-8	
NMeFOSAA	ND	1.0	1.0	0.075	1	2355-31-9	
NEtFOSAA	ND	1.0	1.0	0.070	1	2991-50-6	
PFDS	ND	1.0	1.0	0.060	1	335-77-3	
PFDOA	ND	1.0	1.0	0.084	1	307-55-1	
MeFOSE	ND	1.0	1.0	0.056	1	24448-09-7	
10:2 FTS	ND	1.0	1.0	0.066	1	120226-60-0	
EtFOSE	ND	1.0	1.0	0.071	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.98	0.98	0.063	1	763051-92-9	
PFTrDA	ND	1.0	1.0	0.085	1	72629-94-8	
PFDoS	ND	1.0	1.0	0.065	1	79780-39-5	
PFTDA	ND	1.0	1.0	0.043	1	376-06-7	
PFHXDA	ND	1.0	1.0	0.065	1	67905-19-5	
PFODA	ND	1.0	1.0	0.085	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882004	Total Amount Extracted	482mL
Lab File ID	B210219B_012	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 16:07	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	10	101	50-200	
13C4_PFOA	10	14	132	50-200	
13C2_PFDA	10	16	152	50-200	
13C4_PFOS	9.9	15	150	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	3.7	**36**	50-200	R
13C5_PFPeA	10	7.1	69	50-200	
13C3_PFBS	9.6	13	134	50-200	
13C2_4:2FTS	9.7	53	**547**	50-200	R
13C5_PFHxA	10	11	110	50-200	
13C4_PFHpA	10	14	136	50-200	
13C3_PFHxS	9.8	14	142	50-200	
13C2_6:2FTS	9.9	51	**513**	50-200	R
13C8_PFOA	10	16	156	50-200	
13C9_PFNA	10	15	143	50-200	
13C8_PFOS	9.9	14	141	50-200	
13C2_8:2FTS	9.9	24	**245**	50-200	R
13C6_PFDA	10	15	147	50-200	
d3-MeFOSAA	10	15	147	50-200	
13C8_PFOSA	10	4.6	**44**	50-200	R
d5-EtFOSAA	10	19	179	50-200	
13C7_PFUdA	10	17	163	50-200	
13C2_PFDoA	10	15	143	50-200	
13C2_PFTeDA	10	12	116	50-200	
13C3_HFPO-DA	10	8.7	84	50-200	
13C2_PFHxDA	10	9.9	96	50-200	
d7-N-MeFOSE	10	1.5	**14**	50-200	R
d9-N-EtFOSE	10	1.8	**17**	50-200	R
d3-N-MeFOSA	10	0.14	**1**	50-200	R
d5-N-EtFOSA	10	0.13	**1**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882004	Total Amount Extracted	482mL
Lab File ID	B210219B_012	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 16:07	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.03	6.03	
13C4_PFOA	N/A	N/A	7.47	7.48	
13C2_PFDA	N/A	N/A	9.05	9.07	
13C4_PFOS	N/A	N/A	9.59	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.73	4.73	R
13C5_PFPeA	N/A	N/A	5.43	5.42	
13C3_PFBS	N/A	N/A	6.28	6.29	
13C2_4:2FTS	N/A	N/A	5.77	5.77	R
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.72	6.73	
13C3_PFHxS	N/A	N/A	7.92	7.94	
13C2_6:2FTS	N/A	N/A	7.09	7.10	R
13C8_PFOA	N/A	N/A	7.47	7.48	
13C9_PFNA	N/A	N/A	8.26	8.25	
13C8_PFOS	N/A	N/A	9.60	9.61	
13C2_8:2FTS	N/A	N/A	8.61	8.61	R
13C6_PFDA	N/A	N/A	9.05	9.06	
d3-MeFOSAA	N/A	N/A	8.96	8.97	
13C8_PFOSA	N/A	N/A	12.47	12.53	R
d5-EtFOSAA	N/A	N/A	9.33	9.33	
13C7_PFUdA	N/A	N/A	9.86	9.87	
13C2_PFDoA	N/A	N/A	10.67	10.69	
13C2_PFTeDA	N/A	N/A	12.25	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.72	13.81	
d7-N-MeFOSE	N/A	N/A	14.74	14.84	R
d9-N-EtFOSE	N/A	N/A	15.43	15.55	R
d3-N-MeFOSA	N/A	N/A	15.04	15.16	R
d5-N-EtFOSA	N/A	N/A	15.71	15.82	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882004	Total Amount Extracted	482mL
Lab File ID	B210219B_012	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 16:07	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.74	4.76	
PFPeA	N/A	N/A	5.43	5.43	
HFPO-DA	0.000	0.300	6.30	6.31	
PFBS	2.62	0.370	6.29	6.29	
PFHxA	8.33	0.140	6.04	6.04	
4:2 FTS	0.000	1.10	5.79	5.77	
PFPeS	2.95	0.350	7.09	7.11	
PFHpA	2.52	0.490	6.73	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	3.80	0.300	7.92	7.91	
PFOA	1.61	0.580	7.48	7.48	
6:2 FTS	0.000	1.20	7.09	7.10	
PFHpS	3.81	0.230	8.76	8.78	
PFNA	2.60	0.480	8.26	8.26	
PFOSAm	N/A	N/A	12.46	12.54	
PFOS	9.35	0.230	9.27	9.40	I
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	0.00	9.07	
EtFOSAm	0.000	0.550	0.00	15.84	
8:2 FTS	0.000	1.20	8.63	8.62	
9-Cl-PF3ON	0.000	0.0370	0.00	10.21	
PFNS	0.000	0.370	0.00	10.44	
PFUnDA	0.000	0.210	9.86	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	2.82	0.280	11.24	11.26	
PFDOA	0.000	0.390	0.00	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.875	1.50	10.24	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	3.47	0.220	12.73	12.81	
PFTDA	0.000	0.300	0.00	12.32	
PFHXDA	7.62	0.190	13.73	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882005	Total Amount Extracted	493mL
Lab File ID	B210219B_013	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 15:06	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	59	1.0	1.0	0.076	1	375-22-4	
PFPeA	ND	1.0	1.0	0.050	1	2706-90-3	
HFPO-DA	ND	1.0	1.0	0.048	1	13252-13-6	
PFBS	0.93	0.90	0.90	0.052	1	375-73-5	
PFHxA	ND	1.0	1.0	0.057	1	307-24-4	
4:2 FTS	ND	0.95	0.95	0.076	1	757124-72-4	
PFPeS	ND	0.95	0.95	0.059	1	2706-91-4	
PFHpA	ND	1.0	1.0	0.070	1	375-85-9	
DONA	ND	0.96	0.96	0.061	1	919005-14-4	
PFHxS	ND	0.92	0.92	0.039	1	355-46-4	
PFOA	ND	1.0	1.0	0.045	1	335-67-1	
6:2 FTS	ND	0.96	0.96	0.079	1	27619-97-2	
PFHpS	ND	0.96	0.96	0.060	1	375-92-8	
PFNA	ND	1.0	1.0	0.046	1	375-95-1	
PFOSAm	ND	1.0	1.0	0.055	1	754-91-6	
PFOS	ND	0.94	0.94	0.046	1	1763-23-1	
MeFOSA	ND	1.0	1.0	0.082	1	31506-32-8	
PFDA	ND	1.0	1.0	0.061	1	335-76-2	
EtFOSAm	ND	1.0	1.0	0.077	1	4151-50-2	
8:2 FTS	ND	0.97	0.97	0.079	1	39108-34-4	
9-Cl-PF3ON	ND	0.94	0.94	0.069	1	756426-58-1	
PFNS	ND	0.97	0.97	0.055	1	68259-12-1	
PFUnDA	ND	1.0	1.0	0.084	1	2058-94-8	
NMeFOSAA	ND	1.0	1.0	0.073	1	2355-31-9	
NEtFOSAA	ND	1.0	1.0	0.068	1	2991-50-6	
PFDS	ND	0.98	0.98	0.059	1	335-77-3	
PFDOA	ND	1.0	1.0	0.082	1	307-55-1	
MeFOSE	ND	1.0	1.0	0.055	1	24448-09-7	
10:2 FTS	ND	0.98	0.98	0.064	1	120226-60-0	
EtFOSE	ND	1.0	1.0	0.069	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.95	0.95	0.061	1	763051-92-9	
PFTrDA	ND	1.0	1.0	0.083	1	72629-94-8	
PFDoS	ND	0.98	0.98	0.064	1	79780-39-5	
PFTDA	ND	1.0	1.0	0.042	1	376-06-7	
PFHXDA	ND	1.0	1.0	0.063	1	67905-19-5	
PFODA	ND	1.0	1.0	0.083	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882005	Total Amount Extracted	493mL
Lab File ID	B210219B_013	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 15:06	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	11	113	50-200	
13C4_PFOA	10	11	112	50-200	
13C2_PFDA	10	13	127	50-200	
13C4_PFOS	9.7	13	137	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	13	124	50-200	
13C5_PFPeA	10	12	118	50-200	
13C3_PFBS	9.4	11	121	50-200	
13C2_4:2FTS	9.5	24	**250**	50-200	R
13C5_PFHxA	10	13	125	50-200	
13C4_PFHpA	10	13	131	50-200	
13C3_PFHxS	9.6	12	125	50-200	
13C2_6:2FTS	9.6	17	176	50-200	
13C8_PFOA	10	12	121	50-200	
13C9_PFNA	10	12	116	50-200	
13C8_PFOS	9.7	13	135	50-200	
13C2_8:2FTS	9.7	13	132	50-200	
13C6_PFDA	10	13	124	50-200	
d3-MeFOSAA	10	15	145	50-200	
13C8_PFOSA	10	11	105	50-200	
d5-EtFOSAA	10	15	148	50-200	
13C7_PFUdA	10	16	158	50-200	
13C2_PFDoA	10	13	132	50-200	
13C2_PFTeDA	10	9.7	96	50-200	
13C3_HFPO-DA	10	10	101	50-200	
13C2_PFHxDA	10	10	101	50-200	
d7-N-MeFOSE	10	9.9	98	50-200	
d9-N-EtFOSE	10	9.3	92	50-200	
d3-N-MeFOSA	10	6.5	64	50-200	
d5-N-EtFOSA	10	6.2	62	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882005	Total Amount Extracted	493mL
Lab File ID	B210219B_013	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 15:06	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFOA	N/A	N/A	7.47	7.48	
13C2_PFDA	N/A	N/A	9.06	9.07	
13C4_PFOS	N/A	N/A	9.59	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.75	4.73	
13C5_PFPeA	N/A	N/A	5.44	5.42	
13C3_PFBS	N/A	N/A	6.29	6.29	
13C2_4:2FTS	N/A	N/A	5.78	5.77	R
13C5_PFHxA	N/A	N/A	6.03	6.03	
13C4_PFHpA	N/A	N/A	6.72	6.73	
13C3_PFHxS	N/A	N/A	7.92	7.94	
13C2_6:2FTS	N/A	N/A	7.09	7.10	
13C8_PFOA	N/A	N/A	7.47	7.48	
13C9_PFNA	N/A	N/A	8.26	8.25	
13C8_PFOS	N/A	N/A	9.59	9.61	
13C2_8:2FTS	N/A	N/A	8.61	8.61	
13C6_PFDA	N/A	N/A	9.06	9.06	
d3-MeFOSAA	N/A	N/A	8.95	8.97	
13C8_PFOSA	N/A	N/A	12.51	12.53	
d5-EtFOSAA	N/A	N/A	9.33	9.33	
13C7_PFUdA	N/A	N/A	9.85	9.87	
13C2_PFDoA	N/A	N/A	10.67	10.69	
13C2_PFTeDA	N/A	N/A	12.31	12.30	
13C3_HFPO-DA	N/A	N/A	6.30	6.30	
13C2_PFHxDA	N/A	N/A	13.81	13.81	
d7-N-MeFOSE	N/A	N/A	14.82	14.84	
d9-N-EtFOSE	N/A	N/A	15.51	15.55	
d3-N-MeFOSA	N/A	N/A	15.13	15.16	
d5-N-EtFOSA	N/A	N/A	15.79	15.82	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882005	Total Amount Extracted	493mL
Lab File ID	B210219B_013	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 15:06	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.75	4.76	
PFPeA	N/A	N/A	5.44	5.43	
HFPO-DA	0.000	0.300	6.31	6.31	
PFBS	0.370	0.370	6.29	6.29	
PFHxA	0.093	0.140	6.04	6.04	
4:2 FTS	0.000	1.10	5.80	5.77	
PFPeS	0.360	0.350	7.09	7.11	
PFHpA	0.570	0.490	6.73	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.300	0.300	7.93	7.91	
PFOA	0.610	0.580	7.48	7.48	
6:2 FTS	1.70	1.20	7.07	7.10	
PFHpS	0.000	0.230	0.00	8.78	
PFNA	0.000	0.480	0.00	8.26	
PFOSAm	N/A	N/A	12.50	12.54	
PFOS	0.160	0.230	9.46	9.40	
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	9.06	9.07	
EtFOSAm	0.000	0.550	0.00	15.84	
8:2 FTS	0.000	1.20	0.00	8.62	
9-Cl-PF3ON	0.000	0.0370	0.00	10.21	
PFNS	0.000	0.370	10.43	10.44	
PFUnDA	0.000	0.210	0.00	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	0.000	0.280	0.00	11.26	
PFDOA	0.000	0.390	0.00	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.000	0.220	0.00	12.81	
PFTDA	0.110	0.300	12.29	12.32	
PFHXDA	0.160	0.190	13.82	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882006	Total Amount Extracted	490mL
Lab File ID	B210219B_014	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 12:10	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	140 D	5.1	5.1	0.76	10	375-22-4	
PFPeA	17	1.0	1.0	0.050	1	2706-90-3	
HFPO-DA	ND	1.0	1.0	0.048	1	13252-13-6	
PFBS	2.5	0.90	0.90	0.052	1	375-73-5	
PFHxA	11	1.0	1.0	0.057	1	307-24-4	
4:2 FTS	ND	0.95	0.95	0.076	1	757124-72-4	
PFPeS	ND	0.96	0.96	0.060	1	2706-91-4	
PFHpA	4.4	1.0	1.0	0.070	1	375-85-9	
DONA	ND	0.96	0.96	0.061	1	919005-14-4	
PFHxS	ND	0.93	0.93	0.040	1	355-46-4	
PFOA	6.5	1.0	1.0	0.046	1	335-67-1	
6:2 FTS	ND	0.97	0.97	0.080	1	27619-97-2	
PFHpS	ND	0.97	0.97	0.060	1	375-92-8	
PFNA	ND	1.0	1.0	0.046	1	375-95-1	
PFOSAm	ND	1.0	1.0	0.055	1	754-91-6	
PFOS	ND	0.94	0.94	0.046	1	1763-23-1	
MeFOSA	ND	1.0	1.0	0.082	1	31506-32-8	
PFDA	ND	1.0	1.0	0.061	1	335-76-2	
EtFOSAm	ND	1.0	1.0	0.077	1	4151-50-2	
8:2 FTS	ND	0.98	0.98	0.080	1	39108-34-4	
9-Cl-PF3ON	ND	0.95	0.95	0.070	1	756426-58-1	
PFNS	ND	0.98	0.98	0.055	1	68259-12-1	
PFUnDA	ND	1.0	1.0	0.085	1	2058-94-8	
NMeFOSAA	ND	1.0	1.0	0.073	1	2355-31-9	
NEtFOSAA	ND	1.0	1.0	0.068	1	2991-50-6	
PFDS	ND	0.98	0.98	0.059	1	335-77-3	
PFDOA	ND	1.0	1.0	0.083	1	307-55-1	
MeFOSE	ND	1.0	1.0	0.055	1	24448-09-7	
10:2 FTS	ND	0.98	0.98	0.065	1	120226-60-0	
EtFOSE	ND	1.0	1.0	0.070	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.96	0.96	0.062	1	763051-92-9	
PFTrDA	ND	1.0	1.0	0.083	1	72629-94-8	
PFDoS	ND	0.99	0.99	0.064	1	79780-39-5	
PFTDA	ND	1.0	1.0	0.042	1	376-06-7	
PFHXDA	ND	1.0	1.0	0.064	1	67905-19-5	
PFODA	ND	1.0	1.0	0.084	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882006	Total Amount Extracted	490mL
Lab File ID	B210219B_014	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 12:10	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	9.2	90	50-200	
13C4_PFOA	10	12	119	50-200	
13C2_PFDA	10	11	105	50-200	
13C4_PFOS	9.8	12	124	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	2.7	**26**	50-200	R
13C5_PFPeA	10	6.0	59	50-200	
13C3_PFBS	9.5	11	116	50-200	
13C2_4:2FTS	9.5	46	**479**	50-200	R
13C5_PFHxA	10	10	99	50-200	
13C4_PFHpA	10	12	114	50-200	
13C3_PFHxS	9.6	12	125	50-200	
13C2_6:2FTS	9.7	50	**520**	50-200	R
13C8_PFOA	10	14	142	50-200	
13C9_PFNA	10	13	127	50-200	
13C8_PFOS	9.8	12	124	50-200	
13C2_8:2FTS	9.8	33	**335**	50-200	R
13C6_PFDA	10	9.4	92	50-200	
d3-MeFOSAA	10	13	128	50-200	
13C8_PFOSA	10	9.9	97	50-200	
d5-EtFOSAA	10	18	173	50-200	
13C7_PFUdA	10	16	154	50-200	
13C2_PFDoA	10	13	128	50-200	
13C2_PFTeDA	10	10	102	50-200	
13C3_HFPO-DA	10	7.4	72	50-200	
13C2_PFHxDA	10	8.3	82	50-200	
d7-N-MeFOSE	10	6.3	62	50-200	
d9-N-EtFOSE	10	6.0	59	50-200	
d3-N-MeFOSA	10	0.40	**4**	50-200	R
d5-N-EtFOSA	10	0.32	**3**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882006	Total Amount Extracted	490mL
Lab File ID	B210219B_014	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 12:10	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFOA	N/A	N/A	7.46	7.48	
13C2_PFDA	N/A	N/A	9.02	9.07	
13C4_PFOS	N/A	N/A	9.55	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.74	4.73	R
13C5_PFPeA	N/A	N/A	5.43	5.42	
13C3_PFBS	N/A	N/A	6.30	6.29	
13C2_4:2FTS	N/A	N/A	5.78	5.77	R
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.73	6.73	
13C3_PFHxS	N/A	N/A	7.91	7.94	
13C2_6:2FTS	N/A	N/A	7.09	7.10	R
13C8_PFOA	N/A	N/A	7.47	7.48	
13C9_PFNA	N/A	N/A	8.23	8.25	
13C8_PFOS	N/A	N/A	9.55	9.61	
13C2_8:2FTS	N/A	N/A	8.58	8.61	R
13C6_PFDA	N/A	N/A	9.02	9.06	
d3-MeFOSAA	N/A	N/A	8.92	8.97	
13C8_PFOSA	N/A	N/A	12.47	12.53	
d5-EtFOSAA	N/A	N/A	9.29	9.33	
13C7_PFUdA	N/A	N/A	9.81	9.87	
13C2_PFDoA	N/A	N/A	10.64	10.69	
13C2_PFTeDA	N/A	N/A	12.25	12.30	
13C3_HFPO-DA	N/A	N/A	6.32	6.30	
13C2_PFHxDA	N/A	N/A	13.73	13.81	
d7-N-MeFOSE	N/A	N/A	14.74	14.84	
d9-N-EtFOSE	N/A	N/A	15.42	15.55	
d3-N-MeFOSA	N/A	N/A	15.04	15.16	R
d5-N-EtFOSA	N/A	N/A	15.70	15.82	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882006	Total Amount Extracted	490mL
Lab File ID	B210219B_014	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/02/2021 12:10	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.74	4.76	D
PFPeA	N/A	N/A	5.44	5.43	
HFPO-DA	0.000	0.300	6.33	6.31	
PFBS	0.380	0.370	6.30	6.29	
PFHxA	0.120	0.140	6.05	6.04	
4:2 FTS	0.000	1.10	5.78	5.77	
PFPeS	0.440	0.350	7.10	7.11	
PFHpA	0.430	0.490	6.73	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.300	0.300	7.92	7.91	
PFOA	0.580	0.580	7.47	7.48	
6:2 FTS	1.50	1.20	7.10	7.10	
PFHpS	0.000	0.230	0.00	8.78	
PFNA	0.380	0.480	8.24	8.26	
PFOSAm	N/A	N/A	12.45	12.54	
PFOS	0.130	0.230	9.26	9.40	
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	9.04	9.07	
EtFOSAm	0.000	0.550	0.00	15.84	
8:2 FTS	0.000	1.20	8.60	8.62	
9-Cl-PF3ON	0.000	0.0370	0.00	10.21	
PFNS	0.000	0.370	0.00	10.44	
PFUnDA	0.580	0.210	9.81	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	0.000	0.280	0.00	11.26	
PFDOA	0.000	0.390	10.61	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.000	0.220	0.00	12.81	
PFTDA	0.000	0.300	0.00	12.32	
PFHXDA	0.110	0.190	13.72	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882007	Total Amount Extracted	506mL
Lab File ID	B210219B_015	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 12:49	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	15	0.99	0.99	0.074	1	375-22-4	
PFPeA	3.0	0.99	0.99	0.049	1	2706-90-3	
HFPO-DA	ND	0.99	0.99	0.046	1	13252-13-6	
PFBS	2.0	0.87	0.87	0.050	1	375-73-5	
PFHxA	5.0	0.99	0.99	0.055	1	307-24-4	
4:2 FTS	ND	0.92	0.92	0.074	1	757124-72-4	
PFPeS	ND	0.93	0.93	0.058	1	2706-91-4	
PFHpA	2.2	0.99	0.99	0.068	1	375-85-9	
DONA	ND	0.93	0.93	0.059	1	919005-14-4	
PFHxS	3.0	0.90	0.90	0.038	1	355-46-4	
PFOA	8.9	0.99	0.99	0.044	1	335-67-1	
6:2 FTS	ND	0.94	0.94	0.077	1	27619-97-2	
PFHpS	ND	0.94	0.94	0.058	1	375-92-8	
PFNA	ND	0.99	0.99	0.045	1	375-95-1	
PFOSAm	ND	0.99	0.99	0.053	1	754-91-6	
PFOS	6.6	0.91	0.91	0.045	1	1763-23-1	
MeFOSA	ND	0.99	0.99	0.080	1	31506-32-8	
PFDA	ND	0.99	0.99	0.059	1	335-76-2	
EtFOSAm	ND	0.99	0.99	0.075	1	4151-50-2	
8:2 FTS	ND	0.95	0.95	0.077	1	39108-34-4	
9-Cl-PF3ON	ND	0.92	0.92	0.068	1	756426-58-1	
PFNS	ND	0.95	0.95	0.053	1	68259-12-1	
PFUnDA	ND	0.99	0.99	0.082	1	2058-94-8	
NMeFOSAA	ND	0.99	0.99	0.071	1	2355-31-9	
NEtFOSAA	ND	0.99	0.99	0.066	1	2991-50-6	
PFDS	ND	0.95	0.95	0.057	1	335-77-3	
PFDOA	ND	0.99	0.99	0.080	1	307-55-1	
MeFOSE	ND	0.99	0.99	0.053	1	24448-09-7	
10:2 FTS	ND	0.95	0.95	0.063	1	120226-60-0	
EtFOSE	ND	0.99	0.99	0.068	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.93	0.93	0.060	1	763051-92-9	
PFTrDA	ND	0.99	0.99	0.081	1	72629-94-8	
PFDoS	ND	0.96	0.96	0.062	1	79780-39-5	
PFTDA	ND	0.99	0.99	0.041	1	376-06-7	
PFHXDA	ND	0.99	0.99	0.062	1	67905-19-5	
PFODA	ND	0.99	0.99	0.081	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882007	Total Amount Extracted	506mL
Lab File ID	B210219B_015	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 12:49	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.9	10	102	50-200	
13C4_PFOA	9.9	10	103	50-200	
13C2_PFDA	9.9	13	128	50-200	
13C4_PFOS	9.5	12	125	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.9	8.8	89	50-200	
13C5_PFPeA	9.9	8.1	82	50-200	
13C3_PFBS	9.2	9.9	108	50-200	
13C2_4:2FTS	9.2	37	**399**	50-200	R
13C5_PFHxA	9.9	10	106	50-200	
13C4_PFHpA	9.9	11	114	50-200	
13C3_PFHxS	9.4	11	117	50-200	
13C2_6:2FTS	9.4	30	**318**	50-200	R
13C8_PFOA	9.9	11	109	50-200	
13C9_PFNA	9.9	11	112	50-200	
13C8_PFOS	9.5	11	121	50-200	
13C2_8:2FTS	9.5	17	177	50-200	
13C6_PFDA	9.9	13	129	50-200	
d3-MeFOSAA	9.9	13	129	50-200	
13C8_PFOSA	9.9	9.0	91	50-200	
d5-EtFOSAA	9.9	14	140	50-200	
13C7_PFUdA	9.9	14	139	50-200	
13C2_PFDoA	9.9	11	113	50-200	
13C2_PFTeDA	9.9	9.8	100	50-200	
13C3_HFPO-DA	9.9	7.9	80	50-200	
13C2_PFHxDA	9.9	12	120	50-200	
d7-N-MeFOSE	9.9	6.8	68	50-200	
d9-N-EtFOSE	9.9	6.5	65	50-200	
d3-N-MeFOSA	9.9	1.7	**17**	50-200	R
d5-N-EtFOSA	9.9	1.5	**15**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882007	Total Amount Extracted	506mL
Lab File ID	B210219B_015	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 12:49	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFOA	N/A	N/A	7.45	7.48	
13C2_PFDA	N/A	N/A	9.01	9.07	
13C4_PFOS	N/A	N/A	9.54	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.75	4.73	
13C5_PFPeA	N/A	N/A	5.44	5.42	
13C3_PFBS	N/A	N/A	6.29	6.29	
13C2_4:2FTS	N/A	N/A	5.78	5.77	R
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.71	6.73	
13C3_PFHxS	N/A	N/A	7.89	7.94	
13C2_6:2FTS	N/A	N/A	7.07	7.10	R
13C8_PFOA	N/A	N/A	7.45	7.48	
13C9_PFNA	N/A	N/A	8.21	8.25	
13C8_PFOS	N/A	N/A	9.54	9.61	
13C2_8:2FTS	N/A	N/A	8.57	8.61	
13C6_PFDA	N/A	N/A	9.01	9.06	
d3-MeFOSAA	N/A	N/A	8.91	8.97	
13C8_PFOSA	N/A	N/A	12.43	12.53	
d5-EtFOSAA	N/A	N/A	9.28	9.33	
13C7_PFUdA	N/A	N/A	9.81	9.87	
13C2_PFDoA	N/A	N/A	10.61	10.69	
13C2_PFTeDA	N/A	N/A	12.22	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.67	13.81	
d7-N-MeFOSE	N/A	N/A	14.71	14.84	
d9-N-EtFOSE	N/A	N/A	15.39	15.55	
d3-N-MeFOSA	N/A	N/A	15.01	15.16	R
d5-N-EtFOSA	N/A	N/A	15.66	15.82	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882007	Total Amount Extracted	506mL
Lab File ID	B210219B_015	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/03/2021 12:49	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.75	4.76	
PFPeA	N/A	N/A	5.44	5.43	
HFPO-DA	0.000	0.300	6.31	6.31	
PFBS	0.370	0.370	6.29	6.29	
PFHxA	0.120	0.140	6.04	6.04	
4:2 FTS	0.000	1.10	5.78	5.77	
PFPeS	0.340	0.350	7.08	7.11	
PFHpA	0.470	0.490	6.72	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.280	0.300	7.90	7.91	
PFOA	0.630	0.580	7.45	7.48	
6:2 FTS	1.50	1.20	7.06	7.10	
PFHpS	0.310	0.230	8.73	8.78	
PFNA	0.370	0.480	8.22	8.26	
PFOSAm	N/A	N/A	12.42	12.54	
PFOS	0.190	0.230	9.48	9.40	
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	9.01	9.07	
EtFOSAm	0.000	0.550	0.00	15.84	
8:2 FTS	0.000	1.20	8.54	8.62	
9-Cl-PF3ON	0.000	0.0370	0.00	10.21	
PFNS	0.000	0.370	0.00	10.44	
PFUnDA	0.000	0.210	0.00	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	0.000	0.280	0.00	11.26	
PFDOA	0.000	0.390	0.00	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.000	0.220	0.00	12.81	
PFTDA	0.000	0.300	12.23	12.32	
PFHXDA	0.140	0.190	13.68	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882008	Total Amount Extracted	135mL
Lab File ID	B210219B_016	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 16:22	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	78	3.7	3.7	0.28	1	375-22-4	
PFPeA	5.4	3.7	3.7	0.18	1	2706-90-3	
HFPO-DA	ND	3.7	3.7	0.17	1	13252-13-6	
PFBS	ND	3.3	3.3	0.19	1	375-73-5	
PFHxA	ND	3.7	3.7	0.21	1	307-24-4	
4:2 FTS	ND	3.5	3.5	0.28	1	757124-72-4	
PFPeS	ND	3.5	3.5	0.22	1	2706-91-4	
PFHpA	ND	3.7	3.7	0.26	1	375-85-9	
DONA	ND	3.5	3.5	0.22	1	919005-14-4	
PFHxS	ND	3.4	3.4	0.14	1	355-46-4	
PFOA	9.5	3.7	3.7	0.17	1	335-67-1	
6:2 FTS	ND	3.5	3.5	0.29	1	27619-97-2	
PFHpS	ND	3.5	3.5	0.22	1	375-92-8	
PFNA	ND	3.7	3.7	0.17	1	375-95-1	
PFOSAm	ND	3.7	3.7	0.20	1	754-91-6	
PFOS	ND	3.4	3.4	0.17	1	1763-23-1	
MeFOSA	ND	3.7	3.7	0.30	1	31506-32-8	
PFDA	ND	3.7	3.7	0.22	1	335-76-2	
EtFOSAm	ND	3.7	3.7	0.28	1	4151-50-2	
8:2 FTS	ND	3.6	3.6	0.29	1	39108-34-4	
9-Cl-PF3ON	ND	3.5	3.5	0.25	1	756426-58-1	
PFNS	ND	3.6	3.6	0.20	1	68259-12-1	
PFUnDA	ND	3.7	3.7	0.31	1	2058-94-8	
NMeFOSAA	ND	3.7	3.7	0.27	1	2355-31-9	
NEtFOSAA	ND	3.7	3.7	0.25	1	2991-50-6	
PFDS	ND	3.6	3.6	0.22	1	335-77-3	
PFDOA	ND	3.7	3.7	0.30	1	307-55-1	
MeFOSE	ND	3.7	3.7	0.20	1	24448-09-7	
10:2 FTS	ND	3.6	3.6	0.24	1	120226-60-0	
EtFOSE	ND	3.7	3.7	0.25	1	1691-99-2	
11-Cl-PF3OUdS	ND	3.5	3.5	0.22	1	763051-92-9	
PFTrDA	ND	3.7	3.7	0.30	1	72629-94-8	
PFDoS	ND	3.6	3.6	0.23	1	79780-39-5	
PFTDA	ND	3.7	3.7	0.15	1	376-06-7	
PFHXDA	ND	3.7	3.7	0.23	1	67905-19-5	
PFODA	ND	3.7	3.7	0.30	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882008	Total Amount Extracted	135mL
Lab File ID	B210219B_016	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 16:22	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	37	42	114	50-200	
13C4_PFOA	37	41	111	50-200	
13C2_PFDA	37	46	124	50-200	
13C4_PFOS	36	45	127	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	37	36	98	50-200	
13C5_PFPeA	37	39	104	50-200	
13C3_PFBS	34	41	119	50-200	
13C2_4:2FTS	35	140	**394**	50-200	R
13C5_PFHxA	37	43	117	50-200	
13C4_PFHpA	37	47	128	50-200	
13C3_PFHxS	35	41	116	50-200	
13C2_6:2FTS	35	85	**241**	50-200	R
13C8_PFOA	37	46	125	50-200	
13C9_PFNA	37	46	123	50-200	
13C8_PFOS	36	43	121	50-200	
13C2_8:2FTS	36	50	140	50-200	
13C6_PFDA	37	42	112	50-200	
d3-MeFOSAA	37	48	130	50-200	
13C8_PFOSA	37	35	94	50-200	
d5-EtFOSAA	37	51	137	50-200	
13C7_PFUdA	37	50	135	50-200	
13C2_PFDoA	37	41	111	50-200	
13C2_PFTeDA	37	39	104	50-200	
13C3_HFPO-DA	37	36	96	50-200	
13C2_PFHxDA	37	37	100	50-200	
d7-N-MeFOSE	37	34	92	50-200	
d9-N-EtFOSE	37	34	90	50-200	
d3-N-MeFOSA	37	25	68	50-200	
d5-N-EtFOSA	37	24	64	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882008	Total Amount Extracted	135mL
Lab File ID	B210219B_016	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 16:22	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFOA	N/A	N/A	7.47	7.48	
13C2_PFDA	N/A	N/A	9.03	9.07	
13C4_PFOS	N/A	N/A	9.55	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.75	4.73	
13C5_PFPeA	N/A	N/A	5.44	5.42	
13C3_PFBS	N/A	N/A	6.29	6.29	
13C2_4:2FTS	N/A	N/A	5.78	5.77	R
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.72	6.73	
13C3_PFHxS	N/A	N/A	7.91	7.94	
13C2_6:2FTS	N/A	N/A	7.09	7.10	R
13C8_PFOA	N/A	N/A	7.47	7.48	
13C9_PFNA	N/A	N/A	8.23	8.25	
13C8_PFOS	N/A	N/A	9.56	9.61	
13C2_8:2FTS	N/A	N/A	8.59	8.61	
13C6_PFDA	N/A	N/A	9.03	9.06	
d3-MeFOSAA	N/A	N/A	8.93	8.97	
13C8_PFOSA	N/A	N/A	12.46	12.53	
d5-EtFOSAA	N/A	N/A	9.30	9.33	
13C7_PFUdA	N/A	N/A	9.83	9.87	
13C2_PFDoA	N/A	N/A	10.64	10.69	
13C2_PFTeDA	N/A	N/A	12.24	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.71	13.81	
d7-N-MeFOSE	N/A	N/A	14.73	14.84	
d9-N-EtFOSE	N/A	N/A	15.42	15.55	
d3-N-MeFOSA	N/A	N/A	15.04	15.16	
d5-N-EtFOSA	N/A	N/A	15.69	15.82	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882008	Total Amount Extracted	135mL
Lab File ID	B210219B_016	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_004
Collected	02/01/2021 16:22	Ending CCal File	B210219B_017
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.75	4.76	
PFPeA	N/A	N/A	5.45	5.43	
HFPO-DA	0.490	0.300	6.33	6.31	
PFBS	0.380	0.370	6.30	6.29	
PFHxA	0.150	0.140	6.05	6.04	
4:2 FTS	0.000	1.10	5.78	5.77	
PFPeS	0.340	0.350	7.10	7.11	
PFHpA	0.570	0.490	6.73	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.290	0.300	7.91	7.91	
PFOA	0.600	0.580	7.47	7.48	
6:2 FTS	1.30	1.20	7.09	7.10	
PFHpS	0.000	0.230	0.00	8.78	
PFNA	0.000	0.480	0.00	8.26	
PFOSAm	N/A	N/A	12.48	12.54	
PFOS	0.170	0.230	9.34	9.40	
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	0.00	9.07	
EtFOSAm	1.70	0.550	15.76	15.84	
8:2 FTS	0.000	1.20	8.62	8.62	
9-Cl-PF3ON	0.000	0.0370	0.00	10.21	
PFNS	0.000	0.370	10.39	10.44	
PFUnDA	0.000	0.210	9.86	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.860	0.300	9.29	9.15	
PFDS	0.000	0.280	0.00	11.26	
PFDOA	0.000	0.390	0.00	10.70	
MeFOSE	N/A	N/A	14.78	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.000	0.220	12.71	12.81	
PFTDA	0.000	0.300	0.00	12.32	
PFHXDA	0.180	0.190	13.71	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882009	Total Amount Extracted	455mL
Lab File ID	B210219B_018	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_017
Collected	02/03/2021 10:13	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	90	1.1	1.1	0.082	1	375-22-4	
PFPeA	13	1.1	1.1	0.054	1	2706-90-3	
HFPO-DA	ND	1.1	1.1	0.052	1	13252-13-6	
PFBS	2.8	0.97	0.97	0.056	1	375-73-5	
PFHxA	7.5	1.1	1.1	0.062	1	307-24-4	
4:2 FTS	ND	1.0	1.0	0.082	1	757124-72-4	
PFPeS	ND	1.0	1.0	0.064	1	2706-91-4	
PFHpA	3.0	1.1	1.1	0.076	1	375-85-9	
DONA	ND	1.0	1.0	0.066	1	919005-14-4	
PFHxS	1.1	1.00	1.00	0.043	1	355-46-4	
PFOA	11	1.1	1.1	0.049	1	335-67-1	
6:2 FTS	ND	1.0	1.0	0.086	1	27619-97-2	
PFHpS	ND	1.0	1.0	0.065	1	375-92-8	
PFNA	ND	1.1	1.1	0.050	1	375-95-1	
PFOSAm	ND	1.1	1.1	0.059	1	754-91-6	
PFOS	1.1	1.0	1.0	0.050	1	1763-23-1	
MeFOSA	ND	1.1	1.1	0.088	1	31506-32-8	
PFDA	ND	1.1	1.1	0.066	1	335-76-2	
EtFOSAm	ND	1.1	1.1	0.083	1	4151-50-2	
8:2 FTS	ND	1.1	1.1	0.086	1	39108-34-4	
9-Cl-PF3ON	ND	1.0	1.0	0.075	1	756426-58-1	
PFNS	ND	1.1	1.1	0.059	1	68259-12-1	
PFUnDA	ND	1.1	1.1	0.091	1	2058-94-8	
NMeFOSAA	ND	1.1	1.1	0.079	1	2355-31-9	
NEtFOSAA	ND	1.1	1.1	0.074	1	2991-50-6	
PFDS	ND	1.1	1.1	0.064	1	335-77-3	
PFDOA	ND	1.1	1.1	0.089	1	307-55-1	
MeFOSE	ND	1.1	1.1	0.059	1	24448-09-7	
10:2 FTS	ND	1.1	1.1	0.070	1	120226-60-0	
EtFOSE	ND	1.1	1.1	0.075	1	1691-99-2	
11-Cl-PF3OUdS	ND	1.0	1.0	0.066	1	763051-92-9	
PFTrDA	ND	1.1	1.1	0.090	1	72629-94-8	
PFDoS	ND	1.1	1.1	0.069	1	79780-39-5	
PFTDA	ND	1.1	1.1	0.045	1	376-06-7	
PFHXDA	ND	1.1	1.1	0.069	1	67905-19-5	
PFODA	ND	1.1	1.1	0.090	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882009	Total Amount Extracted	455mL
Lab File ID	B210219B_018	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_017
Collected	02/03/2021 10:13	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	11	11	103	50-200	
13C4_PFOA	11	14	131	50-200	
13C2_PFDA	11	16	149	50-200	
13C4_PFOS	11	15	142	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	11	6.8	62	50-200	
13C5_PFPeA	11	8.8	80	50-200	
13C3_PFBS	10	13	127	50-200	
13C2_4:2FTS	10	49	**480**	50-200	R
13C5_PFHxA	11	13	119	50-200	
13C4_PFHpA	11	13	122	50-200	
13C3_PFHxS	10	14	134	50-200	
13C2_6:2FTS	10	50	**477**	50-200	R
13C8_PFOA	11	16	148	50-200	
13C9_PFNA	11	14	131	50-200	
13C8_PFOS	11	14	134	50-200	
13C2_8:2FTS	11	29	**275**	50-200	R
13C6_PFDA	11	16	149	50-200	
d3-MeFOSAA	11	19	173	50-200	
13C8_PFOSA	11	12	106	50-200	
d5-EtFOSAA	11	18	167	50-200	
13C7_PFUdA	11	21	187	50-200	
13C2_PFDoA	11	15	138	50-200	
13C2_PFTeDA	11	12	112	50-200	
13C3_HFPO-DA	11	9.1	83	50-200	
13C2_PFHxDA	11	10	91	50-200	
d7-N-MeFOSE	11	8.6	78	50-200	
d9-N-EtFOSE	11	7.8	71	50-200	
d3-N-MeFOSA	11	1.7	**16**	50-200	R
d5-N-EtFOSA	11	1.3	**12**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882009	Total Amount Extracted	455mL
Lab File ID	B210219B_018	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_017
Collected	02/03/2021 10:13	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFOA	N/A	N/A	7.45	7.48	
13C2_PFDA	N/A	N/A	9.02	9.07	
13C4_PFOS	N/A	N/A	9.55	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.73	4.73	
13C5_PFPeA	N/A	N/A	5.43	5.42	
13C3_PFBS	N/A	N/A	6.29	6.29	
13C2_4:2FTS	N/A	N/A	5.78	5.77	R
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.71	6.73	
13C3_PFHxS	N/A	N/A	7.90	7.94	
13C2_6:2FTS	N/A	N/A	7.08	7.10	R
13C8_PFOA	N/A	N/A	7.45	7.48	
13C9_PFNA	N/A	N/A	8.23	8.25	
13C8_PFOS	N/A	N/A	9.56	9.61	
13C2_8:2FTS	N/A	N/A	8.58	8.61	R
13C6_PFDA	N/A	N/A	9.02	9.06	
d3-MeFOSAA	N/A	N/A	8.93	8.97	
13C8_PFOSA	N/A	N/A	12.45	12.53	
d5-EtFOSAA	N/A	N/A	9.29	9.33	
13C7_PFUdA	N/A	N/A	9.82	9.87	
13C2_PFDoA	N/A	N/A	10.63	10.69	
13C2_PFTeDA	N/A	N/A	12.25	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.74	13.81	
d7-N-MeFOSE	N/A	N/A	14.73	14.84	
d9-N-EtFOSE	N/A	N/A	15.44	15.55	
d3-N-MeFOSA	N/A	N/A	15.05	15.16	R
d5-N-EtFOSA	N/A	N/A	15.71	15.82	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882009	Total Amount Extracted	455mL
Lab File ID	B210219B_018	Ical ID	210219A02
Matrix	Non_Potable_Water	CCal File	B210219B_017
Collected	02/03/2021 10:13	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.74	4.76	
PFPeA	N/A	N/A	5.44	5.43	
HFPO-DA	0.000	0.330	6.33	6.31	
PFBS	0.350	0.370	6.29	6.29	
PFHxA	0.110	0.120	6.04	6.04	
4:2 FTS	0.000	1.10	5.77	5.77	
PFPeS	0.330	0.380	7.08	7.11	
PFHpA	0.490	0.520	6.71	6.73	
DONA	0.000	0.680	7.00	7.01	
PFHxS	0.280	0.280	7.90	7.91	
PFOA	0.610	0.540	7.46	7.48	
6:2 FTS	1.50	1.10	7.08	7.10	
PFHpS	0.000	0.250	0.00	8.78	
PFNA	0.380	0.410	8.23	8.26	
PFOSAm	N/A	N/A	12.45	12.54	
PFOS	0.120	0.240	9.24	9.40	
MeFOSA	0.000	0.550	0.00	15.18	
PFDA	0.000	0.270	0.00	9.07	
EtFOSAm	0.000	0.610	0.00	15.84	
8:2 FTS	0.000	1.20	8.58	8.62	
9-Cl-PF3ON	0.000	0.0360	10.12	10.21	
PFNS	0.000	0.400	0.00	10.44	
PFUnDA	0.000	0.180	0.00	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.420	0.00	9.15	
PFDS	0.000	0.300	0.00	11.26	
PFDOA	0.000	0.380	0.00	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0200	0.00	11.84	
PFTrDA	0.000	0.230	11.46	11.50	
PFDoS	0.000	0.220	0.00	12.81	
PFTDA	0.560	0.260	12.25	12.32	
PFHXDA	0.140	0.190	13.74	13.82	
PFODA	0.000	0.280	14.97	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882010	Total Amount Extracted	501mL
Lab File ID	B210219B_019	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_017
Collected	02/03/2021 13:30	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	ND	1.00	1.00	0.075	1	375-22-4	
PFPeA	ND	1.00	1.00	0.049	1	2706-90-3	
HFPO-DA	ND	1.00	1.00	0.047	1	13252-13-6	
PFBS	1.4	0.88	0.88	0.051	1	375-73-5	
PFHxA	ND	1.00	1.00	0.056	1	307-24-4	
4:2 FTS	ND	0.93	0.93	0.074	1	757124-72-4	
PFPeS	ND	0.94	0.94	0.058	1	2706-91-4	
PFHpA	ND	1.00	1.00	0.069	1	375-85-9	
DONA	ND	0.94	0.94	0.060	1	919005-14-4	
PFHxS	ND	0.91	0.91	0.039	1	355-46-4	
PFOA	ND	1.00	1.00	0.045	1	335-67-1	
6:2 FTS	ND	0.95	0.95	0.078	1	27619-97-2	
PFHpS	ND	0.95	0.95	0.059	1	375-92-8	
PFNA	ND	1.00	1.00	0.045	1	375-95-1	
PFOSAm	ND	1.00	1.00	0.054	1	754-91-6	
PFOS	ND	0.92	0.92	0.045	1	1763-23-1	
MeFOSA	ND	1.00	1.00	0.080	1	31506-32-8	
PFDA	ND	1.00	1.00	0.060	1	335-76-2	
EtFOSAm	ND	1.00	1.00	0.075	1	4151-50-2	
8:2 FTS	ND	0.96	0.96	0.078	1	39108-34-4	
9-Cl-PF3ON	ND	0.93	0.93	0.068	1	756426-58-1	
PFNS	ND	0.96	0.96	0.054	1	68259-12-1	
PFUnDA	ND	1.00	1.00	0.083	1	2058-94-8	
NMeFOSAA	ND	1.00	1.00	0.072	1	2355-31-9	
NEtFOSAA	ND	1.00	1.00	0.067	1	2991-50-6	
PFDS	ND	0.96	0.96	0.058	1	335-77-3	
PFDOA	ND	1.00	1.00	0.081	1	307-55-1	
MeFOSE	ND	1.00	1.00	0.054	1	24448-09-7	
10:2 FTS	ND	0.96	0.96	0.063	1	120226-60-0	
EtFOSE	ND	1.00	1.00	0.068	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.94	0.94	0.060	1	763051-92-9	
PFTrDA	ND	1.00	1.00	0.081	1	72629-94-8	
PFDoS	ND	0.97	0.97	0.063	1	79780-39-5	
PFTDA	ND	1.00	1.00	0.041	1	376-06-7	
PFHXDA	ND	1.00	1.00	0.062	1	67905-19-5	
PFODA	ND	1.00	1.00	0.082	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882010	Total Amount Extracted	501mL
Lab File ID	B210219B_019	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_017
Collected	02/03/2021 13:30	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.0	12	124	50-200	
13C4_PFOA	10.0	12	121	50-200	
13C2_PFDA	10.0	15	154	50-200	
13C4_PFOS	9.6	14	151	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.0	15	154	50-200	
13C5_PFPeA	10.0	13	133	50-200	
13C3_PFBS	9.3	13	139	50-200	
13C2_4:2FTS	9.3	14	153	50-200	
13C5_PFHxA	10.0	13	127	50-200	
13C4_PFHpA	10.0	14	138	50-200	
13C3_PFHxS	9.4	12	130	50-200	
13C2_6:2FTS	9.5	14	147	50-200	
13C8_PFOA	10.0	14	136	50-200	
13C9_PFNA	10.0	12	119	50-200	
13C8_PFOS	9.6	14	145	50-200	
13C2_8:2FTS	9.6	15	154	50-200	
13C6_PFDA	10.0	14	137	50-200	
d3-MeFOSAA	10.0	16	164	50-200	
13C8_PFOSA	10.0	12	120	50-200	
d5-EtFOSAA	10.0	13	134	50-200	
13C7_PFUdA	10.0	17	171	50-200	
13C2_PFDoA	10.0	14	137	50-200	
13C2_PFTeDA	10.0	11	108	50-200	
13C3_HFPO-DA	10.0	11	113	50-200	
13C2_PFHxDA	10.0	10	102	50-200	
d7-N-MeFOSE	10.0	11	106	50-200	
d9-N-EtFOSE	10.0	9.9	99	50-200	
d3-N-MeFOSA	10.0	6.4	64	50-200	
d5-N-EtFOSA	10.0	5.7	58	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882010	Total Amount Extracted	501mL
Lab File ID	B210219B_019	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_017
Collected	02/03/2021 13:30	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFOA	N/A	N/A	7.46	7.48	
13C2_PFDA	N/A	N/A	9.03	9.07	
13C4_PFOS	N/A	N/A	9.56	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.74	4.73	
13C5_PFPeA	N/A	N/A	5.43	5.42	
13C3_PFBS	N/A	N/A	6.29	6.29	
13C2_4:2FTS	N/A	N/A	5.78	5.77	
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.72	6.73	
13C3_PFHxS	N/A	N/A	7.91	7.94	
13C2_6:2FTS	N/A	N/A	7.08	7.10	
13C8_PFOA	N/A	N/A	7.46	7.48	
13C9_PFNA	N/A	N/A	8.24	8.25	
13C8_PFOS	N/A	N/A	9.56	9.61	
13C2_8:2FTS	N/A	N/A	8.60	8.61	
13C6_PFDA	N/A	N/A	9.03	9.06	
d3-MeFOSAA	N/A	N/A	8.94	8.97	
13C8_PFOSA	N/A	N/A	12.47	12.53	
d5-EtFOSAA	N/A	N/A	9.31	9.33	
13C7_PFUdA	N/A	N/A	9.83	9.87	
13C2_PFDoA	N/A	N/A	10.64	10.69	
13C2_PFTeDA	N/A	N/A	12.25	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.75	13.81	
d7-N-MeFOSE	N/A	N/A	14.74	14.84	
d9-N-EtFOSE	N/A	N/A	15.45	15.55	
d3-N-MeFOSA	N/A	N/A	15.06	15.16	
d5-N-EtFOSA	N/A	N/A	15.73	15.82	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	02/15/2021 10:00
Lab Sample ID	10546882010	Total Amount Extracted	501mL
Lab File ID	B210219B_019	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_017
Collected	02/03/2021 13:30	Ending CCal File	B210219B_026
Received	02/03/2021 18:05	Blank File	B210219B_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.75	4.76	
PFPeA	N/A	N/A	5.43	5.43	
HFPO-DA	0.170	0.330	6.32	6.31	
PFBS	0.440	0.370	6.29	6.29	
PFHxA	0.250	0.120	6.04	6.04	
4:2 FTS	0.000	1.10	0.00	5.77	
PFPeS	0.320	0.380	7.08	7.11	
PFHpA	0.000	0.520	0.00	6.73	
DONA	0.000	0.680	0.00	7.01	
PFHxS	0.500	0.280	7.92	7.91	
PFOA	0.750	0.540	7.46	7.48	
6:2 FTS	1.30	1.10	7.06	7.10	
PFHpS	0.000	0.250	8.71	8.78	
PFNA	0.000	0.410	0.00	8.26	
PFOSAm	N/A	N/A	12.46	12.54	
PFOS	0.190	0.240	9.49	9.40	
MeFOSA	0.000	0.550	0.00	15.18	
PFDA	0.000	0.270	0.00	9.07	
EtFOSAm	0.000	0.610	0.00	15.84	
8:2 FTS	0.000	1.20	0.00	8.62	
9-Cl-PF3ON	0.000	0.0360	10.19	10.21	
PFNS	0.000	0.400	0.00	10.44	
PFUnDA	0.000	0.180	0.00	9.88	
NMeFOSAA	0.000	0.580	0.00	8.78	
NEtFOSAA	0.000	0.420	0.00	9.15	
PFDS	0.000	0.300	0.00	11.26	
PFDOA	0.000	0.380	10.63	10.70	
MeFOSE	N/A	N/A	14.81	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	15.54	15.61	
11-Cl-PF3OUdS	0.000	0.0200	0.00	11.84	
PFTrDA	0.000	0.230	0.00	11.50	
PFDoS	0.000	0.220	0.00	12.81	
PFTDA	0.000	0.260	0.00	12.32	
PFHXDA	0.068	0.190	13.74	13.82	
PFODA	0.000	0.280	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKLH	Extraction Date	12/30/1899 00:00
Lab Sample ID	BLANK-86866	Total Amount Extracted	0.000
Lab File ID	B210219B_005	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_004
Collected	02/08/2021 11:45	Ending CCal File	B210219B_017
Received	02/08/2021 11:45	Blank File	

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	ND	1.0	1.0	0.075	1	375-22-4	
PFPeA	ND	1.0	1.0	0.049	1	2706-90-3	
HFPO-DA	ND	1.0	1.0	0.047	1	13252-13-6	
PFBS	ND	0.89	0.89	0.051	1	375-73-5	
PFHxA	ND	1.0	1.0	0.056	1	307-24-4	
4:2 FTS	ND	0.94	0.94	0.075	1	757124-72-4	
PFPeS	ND	0.94	0.94	0.059	1	2706-91-4	
PFHpA	ND	1.0	1.0	0.069	1	375-85-9	
DONA	ND	0.95	0.95	0.060	1	919005-14-4	
PFHxS	ND	0.91	0.91	0.039	1	355-46-4	
PFOA	ND	1.0	1.0	0.045	1	335-67-1	
6:2 FTS	ND	0.95	0.95	0.078	1	27619-97-2	
PFHpS	ND	0.95	0.95	0.059	1	375-92-8	
PFNA	ND	1.0	1.0	0.045	1	375-95-1	
PFOSAm	ND	1.0	1.0	0.054	1	754-91-6	
PFOS	ND	0.93	0.93	0.045	1	1763-23-1	
MeFOSA	ND	1.0	1.0	0.081	1	31506-32-8	
PFDA	ND	1.0	1.0	0.060	1	335-76-2	
EtFOSAm	ND	1.0	1.0	0.076	1	4151-50-2	
8:2 FTS	ND	0.96	0.96	0.078	1	39108-34-4	
9-Cl-PF3ON	ND	0.93	0.93	0.069	1	756426-58-1	
PFNS	ND	0.96	0.96	0.054	1	68259-12-1	
PFUnDA	ND	1.0	1.0	0.083	1	2058-94-8	
NMeFOSAA	ND	1.0	1.0	0.072	1	2355-31-9	
NEtFOSAA	ND	1.0	1.0	0.067	1	2991-50-6	
PFDS	ND	0.97	0.97	0.058	1	335-77-3	
PFDOA	ND	1.0	1.0	0.081	1	307-55-1	
MeFOSE	ND	1.0	1.0	0.054	1	24448-09-7	
10:2 FTS	ND	0.96	0.96	0.064	1	120226-60-0	
EtFOSE	ND	1.0	1.0	0.069	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.94	0.94	0.061	1	763051-92-9	
PFTrDA	ND	1.0	1.0	0.082	1	72629-94-8	
PFDoS	ND	0.97	0.97	0.063	1	79780-39-5	
PFTDA	ND	1.0	1.0	0.041	1	376-06-7	
PFHXDA	ND	1.0	1.0	0.063	1	67905-19-5	
PFODA	ND	1.0	1.0	0.082	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKLH	Extraction Date	12/30/1899 00:00
Lab Sample ID	BLANK-86866	Total Amount Extracted	0.000
Lab File ID	B210219B_005	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_004
Collected	02/08/2021 11:45	Ending CCal File	B210219B_017
Received	02/08/2021 11:45	Blank File	

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	10	103	50-200	
13C4_PFOA	10	9.8	98	50-200	
13C2_PFDA	10	11	110	50-200	
13C4_PFOS	9.6	11	118	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	12	122	50-200	
13C5_PFPeA	10	11	108	50-200	
13C3_PFBS	9.3	11	114	50-200	
13C2_4:2FTS	9.4	11	113	50-200	
13C5_PFHxA	10	11	114	50-200	
13C4_PFHpA	10	11	110	50-200	
13C3_PFHxS	9.5	10	106	50-200	
13C2_6:2FTS	9.5	12	126	50-200	
13C8_PFOA	10	11	110	50-200	
13C9_PFNA	10	10.0	100	50-200	
13C8_PFOS	9.6	11	120	50-200	
13C2_8:2FTS	9.6	10	105	50-200	
13C6_PFDA	10	10	103	50-200	
d3-MeFOSAA	10	11	111	50-200	
13C8_PFOSA	10	9.7	97	50-200	
d5-EtFOSAA	10	12	123	50-200	
13C7_PFUdA	10	12	124	50-200	
13C2_PFDoA	10	11	115	50-200	
13C2_PFTeDA	10	11	113	50-200	
13C3_HFPO-DA	10	9.9	99	50-200	
13C2_PFHxDA	10	11	110	50-200	
d7-N-MeFOSE	10	9.1	91	50-200	
d9-N-EtFOSE	10	9.1	91	50-200	
d3-N-MeFOSA	10	7.2	72	50-200	
d5-N-EtFOSA	10	7.2	72	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKLH	Extraction Date	12/30/1899 00:00
Lab Sample ID	BLANK-86866	Total Amount Extracted	0.000
Lab File ID	B210219B_005	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_004
Collected	02/08/2021 11:45	Ending CCal File	B210219B_017
Received	02/08/2021 11:45	Blank File	

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFOA	N/A	N/A	7.48	7.48	
13C2_PFDA	N/A	N/A	9.07	9.07	
13C4_PFOS	N/A	N/A	9.61	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.73	4.73	
13C5_PFPeA	N/A	N/A	5.43	5.42	
13C3_PFBS	N/A	N/A	6.29	6.29	
13C2_4:2FTS	N/A	N/A	5.77	5.77	
13C5_PFHxA	N/A	N/A	6.04	6.03	
13C4_PFHpA	N/A	N/A	6.73	6.73	
13C3_PFHxS	N/A	N/A	7.93	7.94	
13C2_6:2FTS	N/A	N/A	7.10	7.10	
13C8_PFOA	N/A	N/A	7.48	7.48	
13C9_PFNA	N/A	N/A	8.27	8.25	
13C8_PFOS	N/A	N/A	9.61	9.61	
13C2_8:2FTS	N/A	N/A	8.62	8.61	
13C6_PFDA	N/A	N/A	9.07	9.06	
d3-MeFOSAA	N/A	N/A	8.97	8.97	
13C8_PFOSA	N/A	N/A	12.51	12.53	
d5-EtFOSAA	N/A	N/A	9.34	9.33	
13C7_PFUdA	N/A	N/A	9.87	9.87	
13C2_PFDoA	N/A	N/A	10.69	10.69	
13C2_PFTeDA	N/A	N/A	12.30	12.30	
13C3_HFPO-DA	N/A	N/A	6.31	6.30	
13C2_PFHxDA	N/A	N/A	13.75	13.81	
d7-N-MeFOSE	N/A	N/A	14.77	14.84	
d9-N-EtFOSE	N/A	N/A	15.44	15.55	
d3-N-MeFOSA	N/A	N/A	15.08	15.16	
d5-N-EtFOSA	N/A	N/A	15.71	15.82	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKLH	Extraction Date	12/30/1899 00:00
Lab Sample ID	BLANK-86866	Total Amount Extracted	0.000
Lab File ID	B210219B_005	Ical ID	210219A02
Matrix	Water	CCal File	B210219B_004
Collected	02/08/2021 11:45	Ending CCal File	B210219B_017
Received	02/08/2021 11:45	Blank File	

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	0.00	4.76	
PFPeA	N/A	N/A	0.00	5.43	
HFPO-DA	0.470	0.300	6.33	6.31	
PFBS	0.380	0.370	6.29	6.29	
PFHxA	0.140	0.140	6.04	6.04	
4:2 FTS	0.000	1.10	5.77	5.77	
PFPeS	0.000	0.350	0.00	7.11	
PFHpA	0.660	0.490	6.74	6.73	
DONA	0.000	0.550	0.00	7.01	
PFHxS	0.000	0.300	7.94	7.91	
PFOA	0.650	0.580	7.49	7.48	
6:2 FTS	1.10	1.20	7.09	7.10	
PFHpS	0.710	0.230	8.78	8.78	
PFNA	0.000	0.480	0.00	8.26	
PFOSAm	N/A	N/A	12.51	12.54	
PFOS	0.200	0.230	9.57	9.40	
MeFOSA	0.000	0.530	0.00	15.18	
PFDA	0.000	0.260	9.05	9.07	
EtFOSAm	0.460	0.550	15.78	15.84	
8:2 FTS	0.000	1.20	0.00	8.62	
9-Cl-PF3ON	0.000	0.0370	0.00	10.21	
PFNS	0.000	0.370	0.00	10.44	
PFUnDA	0.000	0.210	0.00	9.88	
NMeFOSAA	0.210	0.580	8.95	8.78	
NEtFOSAA	0.000	0.300	0.00	9.15	
PFDS	0.000	0.280	0.00	11.26	
PFDOA	0.000	0.390	0.00	10.70	
MeFOSE	N/A	N/A	0.00	14.89	
10:2 FTS	0.000	1.50	0.00	10.22	
EtFOSE	0.000	0.000	0.00	15.61	
11-Cl-PF3OUdS	0.000	0.0180	0.00	11.84	
PFTrDA	0.000	0.220	0.00	11.50	
PFDoS	0.500	0.220	12.80	12.81	
PFTDA	0.000	0.300	0.00	12.32	
PFHXDA	0.240	0.190	13.73	13.82	
PFODA	0.000	0.250	0.00	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-86867	Instrument ID	10LCMS02
Run File Name	B210219B_006	Column ID	108EB00219
Analyzed	02/19/2021 20:06	Ical ID	210219A02
Injected By	QL	Level	L

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10	12	116	50-200	
13C4_PFOA	10	11	109	50-200	
13C2_PFDA	10	14	143	50-200	
13C4_PFOS	9.6	13	135	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10	15	145	50-200	
13C5_PFPeA	10	12	124	50-200	
13C3_PFBS	9.3	11	123	50-200	
13C2_4:2FTS	9.4	13	135	50-200	
13C5_PFHxA	10	13	126	50-200	
13C4_PFHpA	10	13	134	50-200	
13C3_PFHxS	9.5	12	122	50-200	
13C2_6:2FTS	9.5	14	152	50-200	
13C8_PFOA	10	12	122	50-200	
13C9_PFNA	10	12	117	50-200	
13C8_PFOS	9.6	13	133	50-200	
13C2_8:2FTS	9.6	12	126	50-200	
13C6_PFDA	10	12	123	50-200	
d3-MeFOSAA	10	13	133	50-200	
13C8_PFOSA	10	11	110	50-200	
d5-EtFOSAA	10	14	140	50-200	
13C7_PFUdA	10	13	134	50-200	
13C2_PFDoA	10	13	133	50-200	
13C2_PFTeDA	10	13	127	50-200	
13C3_HFPO-DA	10	11	109	50-200	
13C2_PFHxDA	10	10	103	50-200	
d7-N-MeFOSE	10	10	103	50-200	
d9-N-EtFOSE	10	9.4	94	50-200	
d3-N-MeFOSA	10	7.2	72	50-200	
d5-N-EtFOSA	10	7.1	71	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-86867	Instrument ID	10LCMS02
Run File Name	B210219B_006	Column ID	108EB00219
Analyzed	02/19/2021 20:06	Ical ID	210219A02
Injected By	QL	Level	L

Native Analytes

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers	CAS No.
PFBA	4.0	4.3	107	70-130		375-22-4
PFPeA	4.0	4.4	109	70-130		2706-90-3
HFPO-DA	4.0	4.3	108	70-130		13252-13-6
PFBS	3.5	4.3	121	70-130		375-73-5
PFHxA	4.0	3.8	96	70-130		307-24-4
4:2 FTS	3.7	4.0	107	70-130		757124-72-4
PFPeS	3.8	4.2	112	70-130		2706-91-4
PFHpA	4.0	4.1	103	70-130		375-85-9
DONA	3.8	4.3	113	70-130		919005-14-4
PFHxS	3.6	4.0	108	70-130		355-46-4
PFOA	4.0	4.6	116	70-130		335-67-1
6:2 FTS	3.8	3.9	104	70-130		27619-97-2
PFHpS	3.8	4.2	110	70-130		375-92-8
PFNA	4.0	4.1	101	70-130		375-95-1
PFOSAm	4.0	4.4	110	70-130		754-91-6
PFOS	3.7	4.0	107	70-130		1763-23-1
MeFOSA	4.0	4.3	108	70-130		31506-32-8
PFDA	4.0	4.6	115	70-130		335-76-2
EtFOSAm	4.0	4.4	111	70-130		4151-50-2
8:2 FTS	3.8	4.3	111	70-130		39108-34-4
9-Cl-PF3ON	3.7	3.9	104	70-130		756426-58-1
PFNS	3.8	4.2	109	70-130		68259-12-1
PFUnDA	4.0	4.5	113	70-130		2058-94-8
NMeFOSAA	4.0	3.8	95	70-130		2355-31-9
NEtFOSAA	4.0	4.1	102	70-130		2991-50-6
PFDS	3.9	4.1	106	70-130		335-77-3
PFDOA	4.0	4.3	107	70-130		307-55-1
MeFOSE	4.0	4.3	108	70-130		24448-09-7
10:2 FTS	3.9	4.0	103	70-130		120226-60-0
EtFOSE	4.0	4.0	100	70-130		1691-99-2
11-Cl-PF3OUdS	3.8	3.5	93	70-130		763051-92-9
PFTrDA	4.0	4.1	102	70-130		72629-94-8
PFDoS	3.9	3.7	96	70-130		79780-39-5
PFTDA	4.0	4.2	106	70-130		376-06-7
PFHXDA	4.0	4.6	114	70-130		67905-19-5
PFODA	4.0	4.5	113	70-130		16517-11-6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-86867	Instrument ID	10LCMS02
Run File Name	B210219B_006	Column ID	108EB00219
Analyzed	02/19/2021 20:06	Ical ID	210219A02
Injected By	QL	Level	L

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.05	6.03	
13C4_PFOA	N/A	N/A	7.48	7.48	
13C2_PFDA	N/A	N/A	9.07	9.07	
13C4_PFOS	N/A	N/A	9.60	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.73	4.73	
13C5_PFPeA	N/A	N/A	5.44	5.42	
13C3_PFBS	N/A	N/A	6.30	6.29	
13C2_4:2FTS	N/A	N/A	5.79	5.77	
13C5_PFHxA	N/A	N/A	6.05	6.03	
13C4_PFHpA	N/A	N/A	6.74	6.73	
13C3_PFHxS	N/A	N/A	7.93	7.94	
13C2_6:2FTS	N/A	N/A	7.11	7.10	
13C8_PFOA	N/A	N/A	7.48	7.48	
13C9_PFNA	N/A	N/A	8.27	8.25	
13C8_PFOS	N/A	N/A	9.60	9.61	
13C2_8:2FTS	N/A	N/A	8.63	8.61	
13C6_PFDA	N/A	N/A	9.07	9.06	
d3-MeFOSAA	N/A	N/A	8.97	8.97	
13C8_PFOSA	N/A	N/A	12.50	12.53	
d5-EtFOSAA	N/A	N/A	9.34	9.33	
13C7_PFUdA	N/A	N/A	9.88	9.87	
13C2_PFDoA	N/A	N/A	10.68	10.69	
13C2_PFTeDA	N/A	N/A	12.29	12.30	
13C3_HFPO-DA	N/A	N/A	6.32	6.30	
13C2_PFHxDA	N/A	N/A	13.77	13.81	
d7-N-MeFOSE	N/A	N/A	14.80	14.84	
d9-N-EtFOSE	N/A	N/A	15.47	15.55	
d3-N-MeFOSA	N/A	N/A	15.10	15.16	
d5-N-EtFOSA	N/A	N/A	15.75	15.82	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-86867	Instrument ID	10LCMS02
Run File Name	B210219B_006	Column ID	108EB00219
Analyzed	02/19/2021 20:06	Ical ID	210219A02
Injected By	QL	Level	L

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.74	4.76	
PFPeA	N/A	N/A	5.44	5.43	
HFPO-DA	0.31	0.30	6.32	6.31	
PFBS	0.35	0.37	6.30	6.29	
PFHxA	0.15	0.14	6.05	6.04	
4:2 FTS	1.10	1.10	5.79	5.77	
PFPeS	0.39	0.35	7.11	7.11	
PFHpA	0.48	0.49	6.74	6.73	
DONA	0.66	0.55	7.02	7.01	
PFHxS	0.32	0.30	7.94	7.91	
PFOA	0.51	0.58	7.49	7.48	
6:2 FTS	0.99	1.20	7.11	7.10	
PFHpS	0.23	0.23	8.77	8.78	
PFNA	0.46	0.48	8.27	8.26	
PFOSAm	N/A	N/A	12.50	12.54	
PFOS	0.24	0.23	9.61	9.40	
MeFOSA	0.53	0.53	15.13	15.18	
PFDA	0.26	0.26	9.07	9.07	
EtFOSAm	0.59	0.55	15.77	15.84	
8:2 FTS	1.20	1.20	8.63	8.62	
9-Cl-PF3ON	0.03	0.03	10.20	10.21	
PFNS	0.34	0.37	10.43	10.44	
PFUnDA	0.22	0.21	9.87	9.88	
NMeFOSAA	0.65	0.58	8.99	8.78	
NEtFOSAA	0.35	0.30	9.35	9.15	
PFDS	0.27	0.28	11.25	11.26	
PFDOA	0.38	0.39	10.69	10.70	
MeFOSE	N/A	N/A	14.84	14.89	
10:2 FTS	1.50	1.50	10.22	10.22	
EtFOSE	0.00	0.00	15.53	15.61	
11-Cl-PF3OUdS	0.02	0.01	11.83	11.84	
PFTrDA	0.22	0.22	11.50	11.50	
PFDoS	0.22	0.22	12.79	12.81	
PFTDA	0.26	0.30	12.29	12.32	
PFHXDA	0.19	0.19	13.77	13.82	
PFODA	0.25	0.25	15.02	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-86889	Instrument ID	10LCMS02
Run File Name	B210219B_007	Column ID	108EB00219
Analyzed	02/19/2021 20:29	Ical ID	210219A02
Injected By	QL	Level	L

Injection Internal Standards

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
13C2_PFHxA	10	12	116	10	103	11.8	50-200	
13C4_PFOA	10	11	109	11	105	3.5	50-200	
13C2_PFDA	10	14	143	12	118	18.9	50-200	
13C4_PFOS	9.6	13	135	12	126	6.3	50-200	

Extracted Internal Standards

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
13C4_PFBA	10	15	145	14	138	4.9	50-200	
13C5_PFPeA	10	12	124	12	117	5.9	50-200	
13C3_PFBS	9.3	11	123	11	116	5.7	50-200	
13C2_4:2FTS	9.4	13	135	12	127	6.1	50-200	
13C5_PFHxA	10	13	126	12	118	6.7	50-200	
13C4_PFHpA	10	13	134	11	115	15.8	50-200	
13C3_PFHxS	9.5	12	122	12	124	1.8	50-200	
13C2_6:2FTS	9.5	14	152	13	140	7.7	50-200	
13C8_PFOA	10	12	122	13	131	7.7	50-200	
13C9_PFNA	10	12	117	12	124	5.6	50-200	
13C8_PFOS	9.6	13	133	13	138	3.5	50-200	
13C2_8:2FTS	9.6	12	126	12	125	1.2	50-200	
13C6_PFDA	10	12	123	11	112	9.4	50-200	
d3-MeFOSAA	10	13	133	12	122	8.7	50-200	
13C8_PFOSA	10	11	110	11	106	3.7	50-200	
d5-EtFOSAA	10	14	140	14	143	2.5	50-200	
13C7_PFUdA	10	13	134	12	124	7.6	50-200	
13C2_PFDoA	10	13	133	13	126	5.4	50-200	
13C2_PFTeDA	10	13	127	11	106	18.3	50-200	
13C3_HFPO-DA	10	11	109	9.7	97	11.0	50-200	
13C2_PFHxDA	10	10	103	11	108	4.7	50-200	
d7-N-MeFOSE	10	10	103	9.5	95	7.7	50-200	
d9-N-EtFOSE	10	9.4	94	9.3	93	1.7	50-200	
d3-N-MeFOSA	10	7.2	72	6.8	68	4.8	50-200	
d5-N-EtFOSA	10	7.1	71	6.8	68	4.2	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-86889	Instrument ID	10LCMS02
Run File Name	B210219B_007	Column ID	108EB00219
Analyzed	02/19/2021 20:29	Ical ID	210219A02
Injected By	QL	Level	L

Native Analytes

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
PFBA	4.0	4.3	107	4.2	105	1.4	70-130	
PFPeA	4.0	4.4	109	4.6	114	5.0	70-130	
HFPO-DA	4.0	4.3	108	4.9	122	11.9	70-130	
PFBS	3.5	4.3	121	4.1	116	3.9	70-130	
PFHxA	4.0	3.8	96	4.3	108	11.8	70-130	
4:2 FTS	3.7	4.0	107	3.9	105	1.2	70-130	
PFPeS	3.8	4.2	112	4.0	106	5.8	70-130	
PFHpA	4.0	4.1	103	4.5	113	9.2	70-130	
DONA	3.8	4.3	113	4.1	108	4.3	70-130	
PFHxS	3.6	4.0	108	3.8	104	3.7	70-130	
PFOA	4.0	4.6	116	4.3	108	6.7	70-130	
6:2 FTS	3.8	3.9	104	3.7	98	5.3	70-130	
PFHpS	3.8	4.2	110	3.8	99	10.2	70-130	
PFNA	4.0	4.1	101	3.7	92	9.1	70-130	
PFOSAm	4.0	4.4	110	4.5	113	3.3	70-130	
PFOS	3.7	4.0	107	3.8	103	3.9	70-130	
MeFOSA	4.0	4.3	108	4.5	113	5.3	70-130	
PFDA	4.0	4.6	115	4.7	118	2.4	70-130	
EtFOSAm	4.0	4.4	111	4.7	117	4.9	70-130	
8:2 FTS	3.8	4.3	111	4.4	114	2.8	70-130	
9-Cl-PF3ON	3.7	3.9	104	3.6	95	8.8	70-130	
PFNS	3.8	4.2	109	3.9	102	6.7	70-130	
PFUnDA	4.0	4.5	113	4.4	109	3.7	70-130	
NMeFOSAA	4.0	3.8	95	4.0	99	4.6	70-130	
NEtFOSAA	4.0	4.1	102	4.3	106	4.1	70-130	
PFDS	3.9	4.1	106	3.5	90	15.9	70-130	
PFDOA	4.0	4.3	107	4.0	99	7.6	70-130	
MeFOSE	4.0	4.3	108	4.3	107	0.4	70-130	
10:2 FTS	3.9	4.0	103	4.0	103	0.2	70-130	
EtFOSE	4.0	4.0	100	4.2	104	4.4	70-130	
11-Cl-PF3OUdS	3.8	3.5	93	3.0	79	16.3	70-130	
PFTrDA	4.0	4.1	102	3.7	93	8.8	70-130	
PFDoS	3.9	3.7	96	3.0	78	20.7	70-130	
PFTDA	4.0	4.2	106	3.9	98	7.8	70-130	
PFHXDA	4.0	4.6	114	4.2	105	8.1	70-130	
PFODA	4.0	4.5	113	4.0	99	13.2	70-130	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-86889	Instrument ID	10LCMS02
Run File Name	B210219B_007	Column ID	108EB00219
Analyzed	02/19/2021 20:29	Ical ID	210219A02
Injected By	QL	Level	L

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	6.05	6.03	
13C4_PFOA	N/A	N/A	7.49	7.48	
13C2_PFDA	N/A	N/A	9.08	9.07	
13C4_PFOS	N/A	N/A	9.63	9.61	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	4.75	4.73	
13C5_PFPeA	N/A	N/A	5.44	5.42	
13C3_PFBS	N/A	N/A	6.31	6.29	
13C2_4:2FTS	N/A	N/A	5.79	5.77	
13C5_PFHxA	N/A	N/A	6.05	6.03	
13C4_PFHpA	N/A	N/A	6.74	6.73	
13C3_PFHxS	N/A	N/A	7.94	7.94	
13C2_6:2FTS	N/A	N/A	7.11	7.10	
13C8_PFOA	N/A	N/A	7.48	7.48	
13C9_PFNA	N/A	N/A	8.27	8.25	
13C8_PFOS	N/A	N/A	9.63	9.61	
13C2_8:2FTS	N/A	N/A	8.64	8.61	
13C6_PFDA	N/A	N/A	9.08	9.06	
d3-MeFOSAA	N/A	N/A	8.99	8.97	
13C8_PFOSA	N/A	N/A	12.50	12.53	
d5-EtFOSAA	N/A	N/A	9.36	9.33	
13C7_PFUdA	N/A	N/A	9.89	9.87	
13C2_PFDoA	N/A	N/A	10.68	10.69	
13C2_PFTeDA	N/A	N/A	12.29	12.30	
13C3_HFPO-DA	N/A	N/A	6.33	6.30	
13C2_PFHxDA	N/A	N/A	13.78	13.81	
d7-N-MeFOSE	N/A	N/A	14.81	14.84	
d9-N-EtFOSE	N/A	N/A	15.49	15.55	
d3-N-MeFOSA	N/A	N/A	15.12	15.16	
d5-N-EtFOSA	N/A	N/A	15.76	15.82	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-86889	Instrument ID	10LCMS02
Run File Name	B210219B_007	Column ID	108EB00219
Analyzed	02/19/2021 20:29	Ical ID	210219A02
Injected By	QL	Level	L

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	4.75	4.76	
PFPeA	N/A	N/A	5.44	5.43	
HFPO-DA	0.29	0.30	6.33	6.31	
PFBS	0.35	0.37	6.31	6.29	
PFHxA	0.13	0.14	6.06	6.04	
4:2 FTS	1.10	1.10	5.79	5.77	
PFPeS	0.37	0.35	7.12	7.11	
PFHpA	0.54	0.49	6.75	6.73	
DONA	0.66	0.55	7.02	7.01	
PFHxS	0.32	0.30	7.95	7.91	
PFOA	0.50	0.58	7.49	7.48	
6:2 FTS	1.20	1.20	7.11	7.10	
PFHpS	0.24	0.23	8.79	8.78	
PFNA	0.46	0.48	8.27	8.26	
PFOSAm	N/A	N/A	12.51	12.54	
PFOS	0.24	0.23	9.63	9.40	
MeFOSA	0.55	0.53	15.14	15.18	
PFDA	0.29	0.26	9.10	9.07	
EtFOSAm	0.57	0.55	15.78	15.84	
8:2 FTS	1.10	1.20	8.64	8.62	
9-Cl-PF3ON	0.03	0.03	10.22	10.21	
PFNS	0.36	0.37	10.44	10.44	
PFUnDA	0.22	0.21	9.89	9.88	
NMeFOSAA	0.58	0.58	8.99	8.78	
NEtFOSAA	0.35	0.30	9.37	9.15	
PFDS	0.30	0.28	11.23	11.26	
PFDOA	0.41	0.39	10.69	10.70	
MeFOSE	N/A	N/A	14.86	14.89	
10:2 FTS	1.50	1.50	10.23	10.22	
EtFOSE	0.00	0.00	15.55	15.61	
11-Cl-PF3OUdS	0.02	0.01	11.82	11.84	
PFTrDA	0.23	0.22	11.48	11.50	
PFDoS	0.24	0.22	12.79	12.81	
PFTDA	0.29	0.30	12.28	12.32	
PFHXDA	0.18	0.19	13.79	13.82	
PFODA	0.24	0.25	15.04	15.07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

March 29, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on March 12, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sylvia Hunter

Sylvia Hunter
sylvia.hunter@pacelabs.com
1(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10551047001	**PSG33**	Air	03/12/21 10:23	03/12/21 15:10
10551047002	**PSG33 Cert# 3881**	Air	03/12/21 10:23	03/12/21 15:10

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10551047001	**PSG33**	Method 3C Gases	AJA	1
		TO-15	GT	61
		TO-3 Air	CH1	1
10551047002	**PSG33 Cert# 3881**	TO-15	MJL	61

PASI-M = Pace Analytical Services - Minneapolis

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Date: March 29, 2021

PSG33 (Lab ID: 10551047001)

- Sample was filled with nitrogen prior to 3C analysis.
- K3: The Total Hydrocarbon (THC) pattern is evenly distributed throughout the chromatogram (before and after toluene).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Method: **Method 3C Gases**
Description: Method 3C AIR - Fixed Gases
Client: Bay West LLC
Date: March 29, 2021

General Information:
1 sample was analyzed for Method 3C Gases by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Method: **TO-15**
Description: TO15 MSV AIR
Client: Bay West LLC
Date: March 29, 2021

General Information:
1 sample was analyzed for TO-15 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Method: **TO-15**
Description: Individual Can Certification
Client: Bay West LLC
Date: March 29, 2021

General Information:
1 sample was analyzed for TO-15 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Method: **TO-3 Air**
Description: TO3 GCV AIR Meth,Ethane,Ethene
Client: Bay West LLC
Date: March 29, 2021

General Information:
1 sample was analyzed for TO-3 Air by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Sample: PSG33 **Lab ID: 10551047001** Collected: 03/12/21 10:23 Received: 03/12/21 15:10 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Method 3C AIR - Fixed Gases	Analytical Method: Method 3C Gases Pace Analytical Services - Minneapolis								
Oxygen	**18.8**	%	2.8	0.043	1.39		03/22/21 13:47	7782-44-7	
TO15 MSV AIR	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Acetone	**9.0**	ug/m3	8.4	3.1	1.39		03/24/21 23:23	67-64-1	
Benzene	**0.23J**	ug/m3	0.90	0.19	1.39		03/24/21 23:23	71-43-2	
Benzyl chloride	**<3.7**	ug/m3	3.7	1.8	1.39		03/24/21 23:23	100-44-7	
Bromodichloromethane	**<1.9**	ug/m3	1.9	0.32	1.39		03/24/21 23:23	75-27-4	
Bromoform	**<7.3**	ug/m3	7.3	1.3	1.39		03/24/21 23:23	75-25-2	
Bromomethane	**<1.1**	ug/m3	1.1	0.25	1.39		03/24/21 23:23	74-83-9	
1,3-Butadiene	**<0.63**	ug/m3	0.63	0.15	1.39		03/24/21 23:23	106-99-0	
2-Butanone (MEK)	**<4.2**	ug/m3	4.2	1.2	1.39		03/24/21 23:23	78-93-3	
Carbon disulfide	**<0.88**	ug/m3	0.88	0.14	1.39		03/24/21 23:23	75-15-0	
Carbon tetrachloride	**<1.8**	ug/m3	1.8	0.30	1.39		03/24/21 23:23	56-23-5	
Chlorobenzene	**<1.3**	ug/m3	1.3	0.22	1.39		03/24/21 23:23	108-90-7	
Chloroethane	**<0.75**	ug/m3	0.75	0.19	1.39		03/24/21 23:23	75-00-3	
Chloroform	**<1.4**	ug/m3	1.4	0.21	1.39		03/24/21 23:23	67-66-3	
Chloromethane	**0.44J**	ug/m3	0.58	0.11	1.39		03/24/21 23:23	74-87-3	
Cyclohexane	**1.0J**	ug/m3	2.4	0.25	1.39		03/24/21 23:23	110-82-7	
Dibromochloromethane	**<2.4**	ug/m3	2.4	0.46	1.39		03/24/21 23:23	124-48-1	
1,2-Dibromoethane (EDB)	**<1.1**	ug/m3	1.1	0.32	1.39		03/24/21 23:23	106-93-4	
1,2-Dichlorobenzene	**<1.7**	ug/m3	1.7	1.0	1.39		03/24/21 23:23	95-50-1	
1,3-Dichlorobenzene	**<1.7**	ug/m3	1.7	1.2	1.39		03/24/21 23:23	541-73-1	
1,4-Dichlorobenzene	**<4.3**	ug/m3	4.3	1.3	1.39		03/24/21 23:23	106-46-7	
Dichlorodifluoromethane	**2.6**	ug/m3	1.4	0.76	1.39		03/24/21 23:23	75-71-8	
1,1-Dichloroethane	**<1.1**	ug/m3	1.1	0.18	1.39		03/24/21 23:23	75-34-3	
1,2-Dichloroethane	**<1.1**	ug/m3	1.1	0.18	1.39		03/24/21 23:23	107-06-2	
1,1-Dichloroethene	**<1.1**	ug/m3	1.1	0.18	1.39		03/24/21 23:23	75-35-4	
cis-1,2-Dichloroethene	**<1.1**	ug/m3	1.1	0.19	1.39		03/24/21 23:23	156-59-2	
trans-1,2-Dichloroethene	**<1.1**	ug/m3	1.1	0.23	1.39		03/24/21 23:23	156-60-5	
1,2-Dichloropropane	**<1.3**	ug/m3	1.3	0.25	1.39		03/24/21 23:23	78-87-5	
cis-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.22	1.39		03/24/21 23:23	10061-01-5	
trans-1,3-Dichloropropene	**<1.3**	ug/m3	1.3	0.92	1.39		03/24/21 23:23	10061-02-6	
Dichlorotetrafluoroethane	**<2.0**	ug/m3	2.0	0.34	1.39		03/24/21 23:23	76-14-2	
Ethanol	**5.5**	ug/m3	2.7	0.79	1.39		03/24/21 23:23	64-17-5	
Ethyl acetate	**<1.0**	ug/m3	1.0	0.17	1.39		03/24/21 23:23	141-78-6	
Ethylbenzene	**1.2J**	ug/m3	1.2	0.22	1.39		03/24/21 23:23	100-41-4	
4-Ethyltoluene	**<3.5**	ug/m3	3.5	0.30	1.39		03/24/21 23:23	622-96-8	
n-Heptane	**<1.2**	ug/m3	1.2	0.21	1.39		03/24/21 23:23	142-82-5	
Hexachloro-1,3-butadiene	**<7.5**	ug/m3	7.5	2.7	1.39		03/24/21 23:23	87-68-3	
n-Hexane	**0.37J**	ug/m3	1.0	0.30	1.39		03/24/21 23:23	110-54-3	
2-Hexanone	**<5.8**	ug/m3	5.8	1.1	1.39		03/24/21 23:23	591-78-6	
Methylene Chloride	**<4.9**	ug/m3	4.9	1.7	1.39		03/24/21 23:23	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.23J**	ug/m3	5.8	0.15	1.39		03/24/21 23:23	108-10-1	
Methyl-tert-butyl ether	**<5.1**	ug/m3	5.1	0.18	1.39		03/24/21 23:23	1634-04-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Sample: PSG33 **Lab ID: 10551047001** Collected: 03/12/21 10:23 Received: 03/12/21 15:10 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
Naphthalene	**<3.7**	ug/m3	3.7	2.6	1.39		03/24/21 23:23	91-20-3	
2-Propanol	**2.4J**	ug/m3	3.5	1.2	1.39		03/24/21 23:23	67-63-0	
Propylene	**3.9**	ug/m3	0.49	0.33	1.39		03/24/21 23:23	115-07-1	
Styrene	**<1.2**	ug/m3	1.2	0.38	1.39		03/24/21 23:23	100-42-5	
1,1,2,2-Tetrachloroethane	**<0.97**	ug/m3	0.97	0.30	1.39		03/24/21 23:23	79-34-5	
Tetrachloroethene	**<0.96**	ug/m3	0.96	0.35	1.39		03/24/21 23:23	127-18-4	
Tetrahydrofuran	**8.0**	ug/m3	0.83	0.18	1.39		03/24/21 23:23	109-99-9	
Toluene	**30.7**	ug/m3	1.1	0.17	1.39		03/24/21 23:23	108-88-3	
1,2,4-Trichlorobenzene	**<10.5**	ug/m3	10.5	5.4	1.39		03/24/21 23:23	120-82-1	
1,1,1-Trichloroethane	**<1.5**	ug/m3	1.5	0.26	1.39		03/24/21 23:23	71-55-6	
1,1,2-Trichloroethane	**<0.77**	ug/m3	0.77	0.24	1.39		03/24/21 23:23	79-00-5	
Trichloroethene	**<0.76**	ug/m3	0.76	0.29	1.39		03/24/21 23:23	79-01-6	
Trichlorofluoromethane	**0.47J**	ug/m3	1.6	0.32	1.39		03/24/21 23:23	75-69-4	
1,1,2-Trichlorotrifluoroethane	**<2.2**	ug/m3	2.2	0.32	1.39		03/24/21 23:23	76-13-1	
1,2,4-Trimethylbenzene	**0.53J**	ug/m3	1.4	0.27	1.39		03/24/21 23:23	95-63-6	
1,3,5-Trimethylbenzene	**0.32J**	ug/m3	1.4	0.28	1.39		03/24/21 23:23	108-67-8	
Vinyl acetate	**<1.0**	ug/m3	1.0	0.16	1.39		03/24/21 23:23	108-05-4	
Vinyl chloride	**<0.36**	ug/m3	0.36	0.12	1.39		03/24/21 23:23	75-01-4	
m&p-Xylene	**3.9**	ug/m3	2.5	0.54	1.39		03/24/21 23:23	179601-23-1	
o-Xylene	**1.1J**	ug/m3	1.2	0.20	1.39		03/24/21 23:23	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air Pace Analytical Services - Minneapolis								
Methane	**<27.8**	ppmv	27.8	11.1	1.39		03/14/21 14:45	74-82-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Sample: PSG33 Cert# 3881 **Lab ID: 10551047002** Collected: 03/12/21 10:23 Received: 03/12/21 15:10 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15								
	Pace Analytical Services - Minneapolis								
Acetone	**<3.0**	ug/m3	3.0	1.1	0.5		02/26/21 21:28	67-64-1	
Benzene	**<0.16**	ug/m3	0.16	0.068	0.5		02/26/21 21:28	71-43-2	
Benzyl chloride	**<1.3**	ug/m3	1.3	0.66	0.5		02/26/21 21:28	100-44-7	
Bromodichloromethane	**<0.68**	ug/m3	0.68	0.11	0.5		02/26/21 21:28	75-27-4	
Bromoform	**<2.6**	ug/m3	2.6	0.46	0.5		02/26/21 21:28	75-25-2	
Bromomethane	**<0.39**	ug/m3	0.39	0.090	0.5		02/26/21 21:28	74-83-9	
1,3-Butadiene	**<0.22**	ug/m3	0.22	0.055	0.5		02/26/21 21:28	106-99-0	
2-Butanone (MEK)	**<1.5**	ug/m3	1.5	0.44	0.5		02/26/21 21:28	78-93-3	
Carbon disulfide	**<0.32**	ug/m3	0.32	0.052	0.5		02/26/21 21:28	75-15-0	
Carbon tetrachloride	**<0.64**	ug/m3	0.64	0.11	0.5		02/26/21 21:28	56-23-5	
Chlorobenzene	**<0.47**	ug/m3	0.47	0.080	0.5		02/26/21 21:28	108-90-7	
Chloroethane	**<0.27**	ug/m3	0.27	0.069	0.5		02/26/21 21:28	75-00-3	
Chloroform	**<0.25**	ug/m3	0.25	0.074	0.5		02/26/21 21:28	67-66-3	
Chloromethane	**<0.21**	ug/m3	0.21	0.039	0.5		02/26/21 21:28	74-87-3	
Cyclohexane	**<0.88**	ug/m3	0.88	0.092	0.5		02/26/21 21:28	110-82-7	
Dibromochloromethane	**<0.86**	ug/m3	0.86	0.17	0.5		02/26/21 21:28	124-48-1	
1,2-Dibromoethane (EDB)	**<0.39**	ug/m3	0.39	0.12	0.5		02/26/21 21:28	106-93-4	
1,2-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.36	0.5		02/26/21 21:28	95-50-1	
1,3-Dichlorobenzene	**<0.61**	ug/m3	0.61	0.42	0.5		02/26/21 21:28	541-73-1	
1,4-Dichlorobenzene	**<1.5**	ug/m3	1.5	0.48	0.5		02/26/21 21:28	106-46-7	
Dichlorodifluoromethane	**<0.50**	ug/m3	0.50	0.27	0.5		02/26/21 21:28	75-71-8	
1,1-Dichloroethane	**<0.41**	ug/m3	0.41	0.064	0.5		02/26/21 21:28	75-34-3	
1,2-Dichloroethane	**<0.21**	ug/m3	0.21	0.066	0.5		02/26/21 21:28	107-06-2	
1,1-Dichloroethene	**<0.40**	ug/m3	0.40	0.064	0.5		02/26/21 21:28	75-35-4	
cis-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.070	0.5		02/26/21 21:28	156-59-2	
trans-1,2-Dichloroethene	**<0.40**	ug/m3	0.40	0.084	0.5		02/26/21 21:28	156-60-5	
1,2-Dichloropropane	**<0.47**	ug/m3	0.47	0.090	0.5		02/26/21 21:28	78-87-5	
cis-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.080	0.5		02/26/21 21:28	10061-01-5	
trans-1,3-Dichloropropene	**<0.46**	ug/m3	0.46	0.33	0.5		02/26/21 21:28	10061-02-6	
Dichlorotetrafluoroethane	**<0.71**	ug/m3	0.71	0.12	0.5		02/26/21 21:28	76-14-2	
Ethanol	**<0.96**	ug/m3	0.96	0.28	0.5		02/26/21 21:28	64-17-5	
Ethyl acetate	**<0.37**	ug/m3	0.37	0.060	0.5		02/26/21 21:28	141-78-6	
Ethylbenzene	**<0.44**	ug/m3	0.44	0.078	0.5		02/26/21 21:28	100-41-4	
4-Ethyltoluene	**<1.2**	ug/m3	1.2	0.11	0.5		02/26/21 21:28	622-96-8	
n-Heptane	**<0.42**	ug/m3	0.42	0.076	0.5		02/26/21 21:28	142-82-5	
Hexachloro-1,3-butadiene	**<2.7**	ug/m3	2.7	0.97	0.5		02/26/21 21:28	87-68-3	
n-Hexane	**<0.36**	ug/m3	0.36	0.11	0.5		02/26/21 21:28	110-54-3	
2-Hexanone	**<2.1**	ug/m3	2.1	0.40	0.5		02/26/21 21:28	591-78-6	
Methylene Chloride	**<1.8**	ug/m3	1.8	0.60	0.5		02/26/21 21:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	**<2.1**	ug/m3	2.1	0.056	0.5		02/26/21 21:28	108-10-1	
Methyl-tert-butyl ether	**<1.8**	ug/m3	1.8	0.066	0.5		02/26/21 21:28	1634-04-4	
Naphthalene	**<1.3**	ug/m3	1.3	0.94	0.5		02/26/21 21:28	91-20-3	
2-Propanol	**<1.2**	ug/m3	1.2	0.43	0.5		02/26/21 21:28	67-63-0	
Propylene	**<0.18**	ug/m3	0.18	0.12	0.5		02/26/21 21:28	115-07-1	
Styrene	**<0.43**	ug/m3	0.43	0.14	0.5		02/26/21 21:28	100-42-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Sample: PSG33 Cert# 3881 **Lab ID: 10551047002** Collected: 03/12/21 10:23 Received: 03/12/21 15:10 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Individual Can Certification	Analytical Method: TO-15 Pace Analytical Services - Minneapolis								
1,1,2,2-Tetrachloroethane	**<0.35**	ug/m3	0.35	0.11	0.5		02/26/21 21:28	79-34-5	
Tetrachloroethene	**<0.34**	ug/m3	0.34	0.12	0.5		02/26/21 21:28	127-18-4	
Tetrahydrofuran	**<0.30**	ug/m3	0.30	0.066	0.5		02/26/21 21:28	109-99-9	
Toluene	**<0.38**	ug/m3	0.38	0.060	0.5		02/26/21 21:28	108-88-3	
1,2,4-Trichlorobenzene	**<3.8**	ug/m3	3.8	2.0	0.5		02/26/21 21:28	120-82-1	
1,1,1-Trichloroethane	**<0.56**	ug/m3	0.56	0.094	0.5		02/26/21 21:28	71-55-6	
1,1,2-Trichloroethane	**<0.28**	ug/m3	0.28	0.087	0.5		02/26/21 21:28	79-00-5	
Trichloroethene	**<0.27**	ug/m3	0.27	0.10	0.5		02/26/21 21:28	79-01-6	
Trichlorofluoromethane	**<0.57**	ug/m3	0.57	0.11	0.5		02/26/21 21:28	75-69-4	
1,1,2-Trichlorotrifluoroethane	**<0.78**	ug/m3	0.78	0.12	0.5		02/26/21 21:28	76-13-1	
1,2,4-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.097	0.5		02/26/21 21:28	95-63-6	
1,3,5-Trimethylbenzene	**<0.50**	ug/m3	0.50	0.10	0.5		02/26/21 21:28	108-67-8	
Vinyl acetate	**<0.36**	ug/m3	0.36	0.057	0.5		02/26/21 21:28	108-05-4	
Vinyl chloride	**<0.13**	ug/m3	0.13	0.042	0.5		02/26/21 21:28	75-01-4	
m&p-Xylene	**<0.88**	ug/m3	0.88	0.19	0.5		02/26/21 21:28	179601-23-1	
o-Xylene	**<0.44**	ug/m3	0.44	0.073	0.5		02/26/21 21:28	95-47-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

QC Batch: 730545
QC Batch Method: Method 3C Gases
Analysis Method: Method 3C Gases
Analysis Description: METHOD 3C AIR - FIXED GASES
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10551047001

METHOD BLANK: 3893555 Matrix: Air
Associated Lab Samples: 10551047001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Oxygen	%	<2.0	2.0	0.031	03/22/21 08:47	

LABORATORY CONTROL SAMPLE & LCSD: 3893556 3893557

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oxygen	%	10	10.7	10.6	107	106	70-130	0	30	

SAMPLE DUPLICATE: 3894297

Parameter	Units	10551163022 Result	Dup Result	RPD	Max RPD	Qualifiers
Oxygen	%	17.6	17.7	0	30	

SAMPLE DUPLICATE: 3894298

Parameter	Units	10551163014 Result	Dup Result	RPD	Max RPD	Qualifiers
Oxygen	%	14.2	14.2	0	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

QC Batch: 731094
QC Batch Method: TO-15
Analysis Method: TO-15
Analysis Description: TO15 MSV AIR Low Level
Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10551047001

METHOD BLANK: 3896049 Matrix: Air
Associated Lab Samples: 10551047001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	<1.1	1.1	0.19	03/24/21 08:46	
1,1,2,2-Tetrachloroethane	ug/m3	<0.70	0.70	0.22	03/24/21 08:46	
1,1,2-Trichloroethane	ug/m3	<0.56	0.56	0.17	03/24/21 08:46	
1,1,2-Trichlorotrifluoroethane	ug/m3	<1.6	1.6	0.23	03/24/21 08:46	
1,1-Dichloroethane	ug/m3	<0.82	0.82	0.13	03/24/21 08:46	
1,1-Dichloroethene	ug/m3	<0.81	0.81	0.13	03/24/21 08:46	
1,2,4-Trichlorobenzene	ug/m3	6.0J	7.5	3.9	03/24/21 08:46	
1,2,4-Trimethylbenzene	ug/m3	<1.0	1.0	0.19	03/24/21 08:46	
1,2-Dibromoethane (EDB)	ug/m3	<0.78	0.78	0.23	03/24/21 08:46	
1,2-Dichlorobenzene	ug/m3	<1.2	1.2	0.73	03/24/21 08:46	
1,2-Dichloroethane	ug/m3	<0.82	0.82	0.13	03/24/21 08:46	MN
1,2-Dichloropropane	ug/m3	<0.94	0.94	0.18	03/24/21 08:46	
1,3,5-Trimethylbenzene	ug/m3	<1.0	1.0	0.20	03/24/21 08:46	
1,3-Butadiene	ug/m3	<0.45	0.45	0.11	03/24/21 08:46	
1,3-Dichlorobenzene	ug/m3	<1.2	1.2	0.84	03/24/21 08:46	
1,4-Dichlorobenzene	ug/m3	<3.1	3.1	0.97	03/24/21 08:46	
2-Butanone (MEK)	ug/m3	<3.0	3.0	0.88	03/24/21 08:46	
2-Hexanone	ug/m3	<4.2	4.2	0.80	03/24/21 08:46	
2-Propanol	ug/m3	<2.5	2.5	0.85	03/24/21 08:46	
4-Ethyltoluene	ug/m3	<2.5	2.5	0.21	03/24/21 08:46	
4-Methyl-2-pentanone (MIBK)	ug/m3	0.12J	4.2	0.11	03/24/21 08:46	
Acetone	ug/m3	<6.0	6.0	2.2	03/24/21 08:46	
Benzene	ug/m3	<0.65	0.65	0.14	03/24/21 08:46	MN
Benzyl chloride	ug/m3	<2.6	2.6	1.3	03/24/21 08:46	
Bromodichloromethane	ug/m3	<1.4	1.4	0.23	03/24/21 08:46	
Bromoform	ug/m3	<5.2	5.2	0.92	03/24/21 08:46	
Bromomethane	ug/m3	<0.79	0.79	0.18	03/24/21 08:46	
Carbon disulfide	ug/m3	<0.63	0.63	0.10	03/24/21 08:46	
Carbon tetrachloride	ug/m3	<1.3	1.3	0.21	03/24/21 08:46	
Chlorobenzene	ug/m3	<0.94	0.94	0.16	03/24/21 08:46	
Chloroethane	ug/m3	<0.54	0.54	0.14	03/24/21 08:46	
Chloroform	ug/m3	<0.99	0.99	0.15	03/24/21 08:46	MN
Chloromethane	ug/m3	<0.42	0.42	0.077	03/24/21 08:46	
cis-1,2-Dichloroethene	ug/m3	<0.81	0.81	0.14	03/24/21 08:46	
cis-1,3-Dichloropropene	ug/m3	<0.92	0.92	0.16	03/24/21 08:46	
Cyclohexane	ug/m3	<1.8	1.8	0.18	03/24/21 08:46	
Dibromochloromethane	ug/m3	<1.7	1.7	0.33	03/24/21 08:46	
Dichlorodifluoromethane	ug/m3	<1.0	1.0	0.55	03/24/21 08:46	
Dichlorotetrafluoroethane	ug/m3	<1.4	1.4	0.24	03/24/21 08:46	
Ethanol	ug/m3	<1.9	1.9	0.57	03/24/21 08:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

METHOD BLANK: 3896049 Matrix: Air
Associated Lab Samples: 10551047001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethyl acetate	ug/m3	<0.73	0.73	0.12	03/24/21 08:46	
Ethylbenzene	ug/m3	<0.88	0.88	0.16	03/24/21 08:46	
Hexachloro-1,3-butadiene	ug/m3	<5.4	5.4	1.9	03/24/21 08:46	
m&p-Xylene	ug/m3	<1.8	1.8	0.38	03/24/21 08:46	
Methyl-tert-butyl ether	ug/m3	<3.7	3.7	0.13	03/24/21 08:46	
Methylene Chloride	ug/m3	<3.5	3.5	1.2	03/24/21 08:46	
n-Heptane	ug/m3	<0.83	0.83	0.15	03/24/21 08:46	
n-Hexane	ug/m3	<0.72	0.72	0.21	03/24/21 08:46	
Naphthalene	ug/m3	2.4J	2.7	1.9	03/24/21 08:46	
o-Xylene	ug/m3	<0.88	0.88	0.15	03/24/21 08:46	
Propylene	ug/m3	<0.35	0.35	0.24	03/24/21 08:46	
Styrene	ug/m3	<0.87	0.87	0.27	03/24/21 08:46	
Tetrachloroethene	ug/m3	<0.69	0.69	0.25	03/24/21 08:46	
Tetrahydrofuran	ug/m3	<0.60	0.60	0.13	03/24/21 08:46	
Toluene	ug/m3	<0.77	0.77	0.12	03/24/21 08:46	
trans-1,2-Dichloroethene	ug/m3	<0.81	0.81	0.17	03/24/21 08:46	
trans-1,3-Dichloropropene	ug/m3	<0.92	0.92	0.66	03/24/21 08:46	
Trichloroethene	ug/m3	<0.55	0.55	0.21	03/24/21 08:46	
Trichlorofluoromethane	ug/m3	<1.1	1.1	0.23	03/24/21 08:46	
Vinyl acetate	ug/m3	<0.72	0.72	0.11	03/24/21 08:46	
Vinyl chloride	ug/m3	<0.26	0.26	0.084	03/24/21 08:46	

LABORATORY CONTROL SAMPLE: 3896050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	59.3	44.9	76	70-130	
1,1,2,2-Tetrachloroethane	ug/m3	75.4	66.2	88	70-132	
1,1,2-Trichloroethane	ug/m3	59.6	48.8	82	70-134	
1,1,2-Trichlorotrifluoroethane	ug/m3	83.6	73.7	88	70-130	
1,1-Dichloroethane	ug/m3	43.9	41.8	95	70-133	
1,1-Dichloroethene	ug/m3	43.5	38.4	88	70-130	
1,2,4-Trichlorobenzene	ug/m3	177	162	92	69-132	
1,2,4-Trimethylbenzene	ug/m3	54	49.7	92	70-142	
1,2-Dibromoethane (EDB)	ug/m3	82.5	66.2	80	70-138	
1,2-Dichlorobenzene	ug/m3	66.2	60.6	92	70-146	
1,2-Dichloroethane	ug/m3	44.4	33.5	75	70-132	
1,2-Dichloropropane	ug/m3	50.6	38.5	76	70-134	
1,3,5-Trimethylbenzene	ug/m3	53.7	46.5	87	70-143	
1,3-Butadiene	ug/m3	24.2	20.4	85	70-136	
1,3-Dichlorobenzene	ug/m3	66.3	60.6	91	70-145	
1,4-Dichlorobenzene	ug/m3	66.3	62.4	94	70-140	
2-Butanone (MEK)	ug/m3	32.3	30.0	93	50-139	
2-Hexanone	ug/m3	44.8	37.6	84	70-148	
2-Propanol	ug/m3	149	133	89	67-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

LABORATORY CONTROL SAMPLE: 3896050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4-Ethyltoluene	ug/m3	53.7	50.4	94	70-145	
4-Methyl-2-pentanone (MIBK)	ug/m3	44.9	37.3	83	70-139	
Acetone	ug/m3	128	112	88	64-130	
Benzene	ug/m3	34.8	26.4	76	70-131	
Benzyl chloride	ug/m3	57.6	59.0	102	70-130	
Bromodichloromethane	ug/m3	73.1	57.1	78	70-133	
Bromoform	ug/m3	114	109	95	70-137	
Bromomethane	ug/m3	42.5	37.1	87	64-134	
Carbon disulfide	ug/m3	34.4	32.8	95	70-131	
Carbon tetrachloride	ug/m3	69.4	58.5	84	70-131	
Chlorobenzene	ug/m3	50.2	40.0	80	70-130	
Chloroethane	ug/m3	28.8	25.2	87	69-141	
Chloroform	ug/m3	52.4	39.7	76	70-130	
Chloromethane	ug/m3	22.6	18.7	83	70-130	
cis-1,2-Dichloroethene	ug/m3	43.4	42.7	98	70-137	
cis-1,3-Dichloropropene	ug/m3	49.4	47.6	96	70-144	
Cyclohexane	ug/m3	37.4	29.7	79	70-137	
Dibromochloromethane	ug/m3	93.2	77.0	83	70-132	
Dichlorodifluoromethane	ug/m3	54.6	48.1	88	70-130	
Dichlorotetrafluoroethane	ug/m3	71.2	58.2	82	70-130	
Ethanol	ug/m3	124	111	89	63-133	
Ethyl acetate	ug/m3	38.9	29.2	75	70-136	
Ethylbenzene	ug/m3	47.8	41.2	86	70-142	
Hexachloro-1,3-butadiene	ug/m3	133	121	91	70-135	
m&p-Xylene	ug/m3	95.4	83.4	87	70-141	
Methyl-tert-butyl ether	ug/m3	39.6	38.7	98	70-143	
Methylene Chloride	ug/m3	190	137	72	70-130	
n-Heptane	ug/m3	44.6	35.5	79	70-137	
n-Hexane	ug/m3	38	30.1	79	70-135	
Naphthalene	ug/m3	65.2	60.9	93	67-132	
o-Xylene	ug/m3	47.6	39.9	84	70-141	
Propylene	ug/m3	18.9	17.8	94	70-130	
Styrene	ug/m3	47	44.8	95	70-142	
Tetrachloroethene	ug/m3	73.4	57.9	79	70-130	
Tetrahydrofuran	ug/m3	32.1	25.2	79	70-136	
Toluene	ug/m3	41.6	33.6	81	70-138	
trans-1,2-Dichloroethene	ug/m3	43.6	43.3	99	70-130	
trans-1,3-Dichloropropene	ug/m3	50.5	42.5	84	70-145	
Trichloroethene	ug/m3	58.4	58.5	100	70-130	
Trichlorofluoromethane	ug/m3	62	54.3	88	69-135	
Vinyl acetate	ug/m3	46.4	43.2	93	70-146	
Vinyl chloride	ug/m3	28	23.7	85	70-137	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

SAMPLE DUPLICATE: 3897221

Parameter	Units	10550921007 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	<2.0		25	
1,1,2,2-Tetrachloroethane	ug/m3	ND	<1.3		25	
1,1,2-Trichloroethane	ug/m3	ND	<1.0		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	<2.8		25	
1,1-Dichloroethane	ug/m3	ND	<1.5		25	
1,1-Dichloroethene	ug/m3	ND	<1.5		25	
1,2,4-Trichlorobenzene	ug/m3	ND	<13.6		25	
1,2,4-Trimethylbenzene	ug/m3	ND	0.41J		25	
1,2-Dibromoethane (EDB)	ug/m3	ND	<1.4		25	
1,2-Dichlorobenzene	ug/m3	ND	<2.2		25	
1,2-Dichloroethane	ug/m3	ND	<1.5		25	
1,2-Dichloropropane	ug/m3	ND	<1.7		25	
1,3,5-Trimethylbenzene	ug/m3	ND	<1.8		25	
1,3-Butadiene	ug/m3	ND	<0.81		25	
1,3-Dichlorobenzene	ug/m3	ND	<2.2		25	
1,4-Dichlorobenzene	ug/m3	ND	<5.5		25	
2-Butanone (MEK)	ug/m3	21.5	20.9	3	25	
2-Hexanone	ug/m3	ND	1.8J		25	
2-Propanol	ug/m3	23.3	23.4	0	25	
4-Ethyltoluene	ug/m3	ND	<4.5		25	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	<7.5		25	
Acetone	ug/m3	34.9	37.2	6	25	
Benzene	ug/m3	ND	0.94J		25	
Benzyl chloride	ug/m3	ND	<4.7		25	
Bromodichloromethane	ug/m3	ND	<2.4		25	
Bromoform	ug/m3	ND	<9.4		25	
Bromomethane	ug/m3	ND	<1.4		25	
Carbon disulfide	ug/m3	ND	<1.1		25	
Carbon tetrachloride	ug/m3	ND	0.45J		25	
Chlorobenzene	ug/m3	ND	<1.7		25	
Chloroethane	ug/m3	ND	<0.96		25	
Chloroform	ug/m3	ND	0.70J		25	
Chloromethane	ug/m3	1.2	1.2	6	25	
cis-1,2-Dichloroethene	ug/m3	ND	<1.5		25	
cis-1,3-Dichloropropene	ug/m3	ND	<1.7		25	
Cyclohexane	ug/m3	ND	0.69J		25	
Dibromochloromethane	ug/m3	ND	<3.1		25	
Dichlorodifluoromethane	ug/m3	4.1	4.0	4	25	
Dichlorotetrafluoroethane	ug/m3	ND	<2.6		25	
Ethanol	ug/m3	226	230	2	25	
Ethyl acetate	ug/m3	ND	<1.3		25	
Ethylbenzene	ug/m3	ND	0.36J		25	
Hexachloro-1,3-butadiene	ug/m3	ND	<9.8		25	
m&p-Xylene	ug/m3	ND	1.1J		25	
Methyl-tert-butyl ether	ug/m3	ND	<6.6		25	
Methylene Chloride	ug/m3	ND	<6.4		25	
n-Heptane	ug/m3	ND	<1.5		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

SAMPLE DUPLICATE: 3897221

Parameter	Units	10550921007 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Hexane	ug/m3	2.9	2.8	3	25	
Naphthalene	ug/m3	ND	<4.8		25	
o-Xylene	ug/m3	ND	0.46J		25	
Propylene	ug/m3	ND	<0.63		25	
Styrene	ug/m3	ND	0.60J		25	
Tetrachloroethene	ug/m3	ND	<1.2		25	
Tetrahydrofuran	ug/m3	ND	<1.1		25	
Toluene	ug/m3	1.4	1.3J		25	
trans-1,2-Dichloroethene	ug/m3	ND	<1.5		25	
trans-1,3-Dichloropropene	ug/m3	ND	<1.7		25	
Trichloroethene	ug/m3	ND	<0.98		25	
Trichlorofluoromethane	ug/m3	ND	1.6J		25	
Vinyl acetate	ug/m3	ND	<1.3		25	
Vinyl chloride	ug/m3	ND	<0.47		25	

SAMPLE DUPLICATE: 3897222

Parameter	Units	10550921011 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	<2.0		25	
1,1,2,2-Tetrachloroethane	ug/m3	ND	<1.3		25	
1,1,2-Trichloroethane	ug/m3	ND	<1.0		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	<2.8		25	
1,1-Dichloroethane	ug/m3	ND	<1.5		25	
1,1-Dichloroethene	ug/m3	ND	<1.5		25	
1,2,4-Trichlorobenzene	ug/m3	ND	<13.6		25	
1,2,4-Trimethylbenzene	ug/m3	ND	<1.8		25	
1,2-Dibromoethane (EDB)	ug/m3	ND	<1.4		25	
1,2-Dichlorobenzene	ug/m3	ND	<2.2		25	
1,2-Dichloroethane	ug/m3	ND	<1.5		25	
1,2-Dichloropropane	ug/m3	ND	<1.7		25	
1,3,5-Trimethylbenzene	ug/m3	ND	<1.8		25	
1,3-Butadiene	ug/m3	ND	<0.81		25	
1,3-Dichlorobenzene	ug/m3	ND	<2.2		25	
1,4-Dichlorobenzene	ug/m3	ND	<5.5		25	
2-Butanone (MEK)	ug/m3	6.6	3.5J		25	
2-Hexanone	ug/m3	ND	<7.5		25	
2-Propanol	ug/m3	ND	<4.5		25	
4-Ethyltoluene	ug/m3	ND	<4.5		25	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	0.44J		25	
Acetone	ug/m3	16.4	16.9	3	25	
Benzene	ug/m3	ND	0.63J		25	
Benzyl chloride	ug/m3	ND	<4.7		25	
Bromodichloromethane	ug/m3	ND	<2.4		25	
Bromoform	ug/m3	ND	<9.4		25	
Bromomethane	ug/m3	ND	<1.4		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

SAMPLE DUPLICATE: 3897222

Parameter	Units	10550921011 Result	Dup Result	RPD	Max RPD	Qualifiers
Carbon disulfide	ug/m3	ND	<1.1		25	
Carbon tetrachloride	ug/m3	ND	<2.3		25	
Chlorobenzene	ug/m3	ND	<1.7		25	
Chloroethane	ug/m3	ND	<0.96		25	
Chloroform	ug/m3	ND	0.37J		25	
Chloromethane	ug/m3	0.94	0.92	2	25	
cis-1,2-Dichloroethene	ug/m3	ND	<1.5		25	
cis-1,3-Dichloropropene	ug/m3	ND	<1.7		25	
Cyclohexane	ug/m3	ND	0.45J		25	
Dibromochloromethane	ug/m3	ND	<3.1		25	
Dichlorodifluoromethane	ug/m3	3.9	4.1	6	25	
Dichlorotetrafluoroethane	ug/m3	ND	<2.6		25	
Ethanol	ug/m3	20.5	20.6	1	25	
Ethyl acetate	ug/m3	ND	<1.3		25	
Ethylbenzene	ug/m3	ND	<1.6		25	
Hexachloro-1,3-butadiene	ug/m3	ND	<9.8		25	
m&p-Xylene	ug/m3	ND	0.76J		25	
Methyl-tert-butyl ether	ug/m3	ND	<6.6		25	
Methylene Chloride	ug/m3	ND	<6.4		25	
n-Heptane	ug/m3	ND	<1.5		25	
n-Hexane	ug/m3	ND	0.87J		25	
Naphthalene	ug/m3	ND	<4.8		25	
o-Xylene	ug/m3	ND	0.31J		25	
Propylene	ug/m3	ND	<0.63		25	
Styrene	ug/m3	ND	<1.6		25	
Tetrachloroethene	ug/m3	ND	<1.2		25	
Tetrahydrofuran	ug/m3	ND	<1.1		25	
Toluene	ug/m3	ND	0.97J		25	
trans-1,2-Dichloroethene	ug/m3	ND	<1.5		25	
trans-1,3-Dichloropropene	ug/m3	ND	<1.7		25	
Trichloroethene	ug/m3	ND	<0.98		25	
Trichlorofluoromethane	ug/m3	ND	1.3J		25	
Vinyl acetate	ug/m3	ND	<1.3		25	
Vinyl chloride	ug/m3	ND	<0.47		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

QC Batch: 729384
QC Batch Method: TO-3 Air
Analysis Method: TO-3 Air
Analysis Description: TO3 GCV AIR METH,ETHANE,ETHENE
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10551047001

METHOD BLANK: 3887903 Matrix: Air
Associated Lab Samples: 10551047001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ppmv	<20.0	20.0	8.0	03/14/21 12:57	

LABORATORY CONTROL SAMPLE & LCSD: 3887904 3887905

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ppmv	1000	1060	1010	106	101	70-130	4	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

SAMPLE QUALIFIERS

Sample: 10551047001

[1]	Sample was filled with nitrogen prior to 3C analysis.
[2]	The Total Hydrocarbon (THC) pattern is evenly distributed throughout the chromatogram (before and after toluene).

ANALYTE QUALIFIERS

MN	The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 Vadnais Heights Demo
Pace Project No.: 10551047

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10551047001	**PSG33**	Method 3C Gases	730545		
10551047001	**PSG33**	TO-15	731094		
10551047002	**PSG33 Cert# 3881**	TO-15	731356		
10551047001	**PSG33**	TO-3 Air	729384		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — **Required** Client Information:

Company:	Bay West
Address:	5 Empire Dr. St.Paul MN, 55103
Project Manager :	Erik Nimlos
Email To:	enimlos@baywest.com
Phone:	651-291-3493
Copy To:	Eweaver@baywest.com

Section B — **Required** Project Information:

Project Name:	SW#27 Vadnais Heights Demo Landfi
Project Number:	200402
Turnaround Time:	Standard
Site Location (State):	MN
Copy To:	ryanr@baywest.com
Copy To:	gvanderwaal@baywest.com

Section C — Invoice Information:

Attention:	Accounts Payable
Company Name:	Bay West LLC
Address:	5 Empire Dr. St. Paul, MN 55103
Purchase Order No.	205946

Section D — Laboratory Information

Lab Name:	Pace
Adress:	) Elm St. Minneapolis MN, 5
Lab Project Manager	Colin Lynch
Lab Phone:	612-656-2286

Section E — MPCA Information

COC ID:	
Work Order Numbe	3000027125
Facility Code:	SW-136
Project Task Code:	PRJ07913
Program Code	

WO# : 10551047

10551047

Matrix Code
SE=Sediment
SO=Soil
QC=Soil QC
W=Aqueous
WG=Groundwater
S=Surface

Lab Matrix Codes
DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe
AR=Air
BL=Biological Material
OT=Other

Field Matrix Codes
Gas-Soil= Soil Gas
Air-Ambnt= Ambient Air
Air-Indoor= Indoor Air

Sample Type Codes
Sample=Routine Sample
S-CWOP=Composite Sample
S-IVP=Integrated Vertical Profile Sample
QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	Date Start	Date End	Time Start	Time End	Start Pressure	End Pressure	Sample Type (G=GRAB C=COMP)	Lab Matrix Code	Field Matrix Code	Can #	Reg. #	# of Containers	Preservatives	Requested Analysis: TO-15	TO-3M (Methane)	TO-3C (Oxygen)	Comments
1	2001007194	PSG33	Sample	3/12/21	3/12/21	0941	1023	-30	-3	G	AR	Gas-Soil	3881	1627	1		X	X	X	001 002
2	~~2001007195~~	~~PSG34~~	~~Sample~~							G	AR	Gas-Soil					X	X	X	OMIT
3	~~2001007196~~	~~PSG35~~	~~Sample~~							G	AR	Gas-Soil					X	X	X	OMIT
4	~~2001007197~~	~~PSG36~~	~~Sample~~							G	AR	Gas-Soil					X	X	X	OMIT
5	~~2001007198~~	~~PSG37~~	~~Sample~~							G	AR	Gas-Soil					X	X	X	OMIT
6																				
7																				
8																				
9																				
10																				
11																				
12																				

TO-15

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		3/12/21	1510	Pace	3/12/21	15:10	

Temp (°C) | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: ZACH MASON

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 3/12/21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - Air**	Document Revised: 24Mar2020 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0113 Rev**	Pace Analytical Services -

WO#: 10551047
PM: CL1 Due Date: 03/26/21
CLIENT: BW-BAY WEST

Air Sample Condition Upon Receipt **Client Name:** Bay West **Project #:**

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Pace ☐ SpeeDee ☐ Commercial **See Exception** ☐

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ Foam ☒ None ☐ Tin Can ☐ Other:_____ **Temp Blank rec:** ☐ Yes ☒ No

Temp. (TO17 and TO13 samples only) (°C): — **Corrected Temp (°C):** — **Thermometer Used:** ☐ G87A9170600254 ☐ G87A9155100842

Temp should be above freezing to 6°C **Correction Factor:** — **Date & Initials of Person Examining Contents:** RG 3/12/21

Type of ice Received ☐ Blue ☐ Wet ☒ None

		Comments:
Chain of Custody Present?	☒ Yes ☐ No	1.
Chain of Custody Filled Out?	☒ Yes ☐ No	2.
Chain of Custody Relinquished?	☒ Yes ☐ No	3.
Sampler Name and/or Signature on COC?	☒ Yes ☐ No ☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes ☐ No	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes ☒ No	6.
Rush Turn Around Time Requested?	☐ Yes ☒ No	7.
Sufficient Volume?	☒ Yes ☐ No	8.
Correct Containers Used? **(Tedlar bags not acceptable container for TO-14, TO-15 or APH)** -Pace Containers Used?	☒ Yes ☐ No ☒ Yes ☐ No	9.
Containers Intact? **(visual inspection/no leaks when pressurized)**	☒ Yes ☐ No	10.
Media: (Air Can) Airbag Filter TDT Passive		11. Individually Certified Cans? (Y) N (list which samples)
Is sufficient information available to reconcile samples to the COC?	☒ Yes ☐ No	12.
Do cans need to be pressurized? **(DO NOT PRESSURIZE 3C or ASTM 1946!!!)**	☒ Yes ☐ No RG 3/12/21	13.

Gauge # ☐ 10AIR26 ☒ 10AIR34 ☐ 10AIR35 ☐ 4097

RG 3/12/21

Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
~~PSG 32~~	3881	1627	-1	~~75~~	RG 3/12/21				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 3/15/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Data File: \\192.168.10.12\chem\10airD.i\032421.b\08326.d
Report Date: 25-Mar-2021 13:40

Pace Analytical Services, Inc.

TO15 Analysis (UNIX)

Data file : \\192.168.10.12\chem\10airD.i\032421.b\08326.d
Lab Smp Id: 10551047001
Inj Date : 24-MAR-2021 23:23
Operator : GT Inst ID: 10airD.i
Smp Info :
Misc Info : 38996
Comment : Volatile Organic COMPOUNDS in Air
Method : \\192.168.10.12\chem\10airD.i\032421.b\TO15_082-21.m
Meth Date : 25-Mar-2021 12:50 10airD.i Quant Type: ISTD
Cal Date : 23-MAR-2021 16:31 Cal File: 08209.d
Als bottle: 26
Dil Factor: 1.39000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: RC10A
Processing Host: 10MNAIRWKS10

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

Data File: \\192.168.10.12\chem\10airD.i\032421.b\08326.d
Report Date: 25-Mar-2021 13:40

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: Client SDG: 032421.b
Lab Smp Id: 10551047001
Operator : GT Sample Date:
Sample Location: Sample Point:
Sample Matrix: AIR Date Received:
Analysis Type: VOA Level: LOW
Inj Date: 24-MAR-2021 23:23

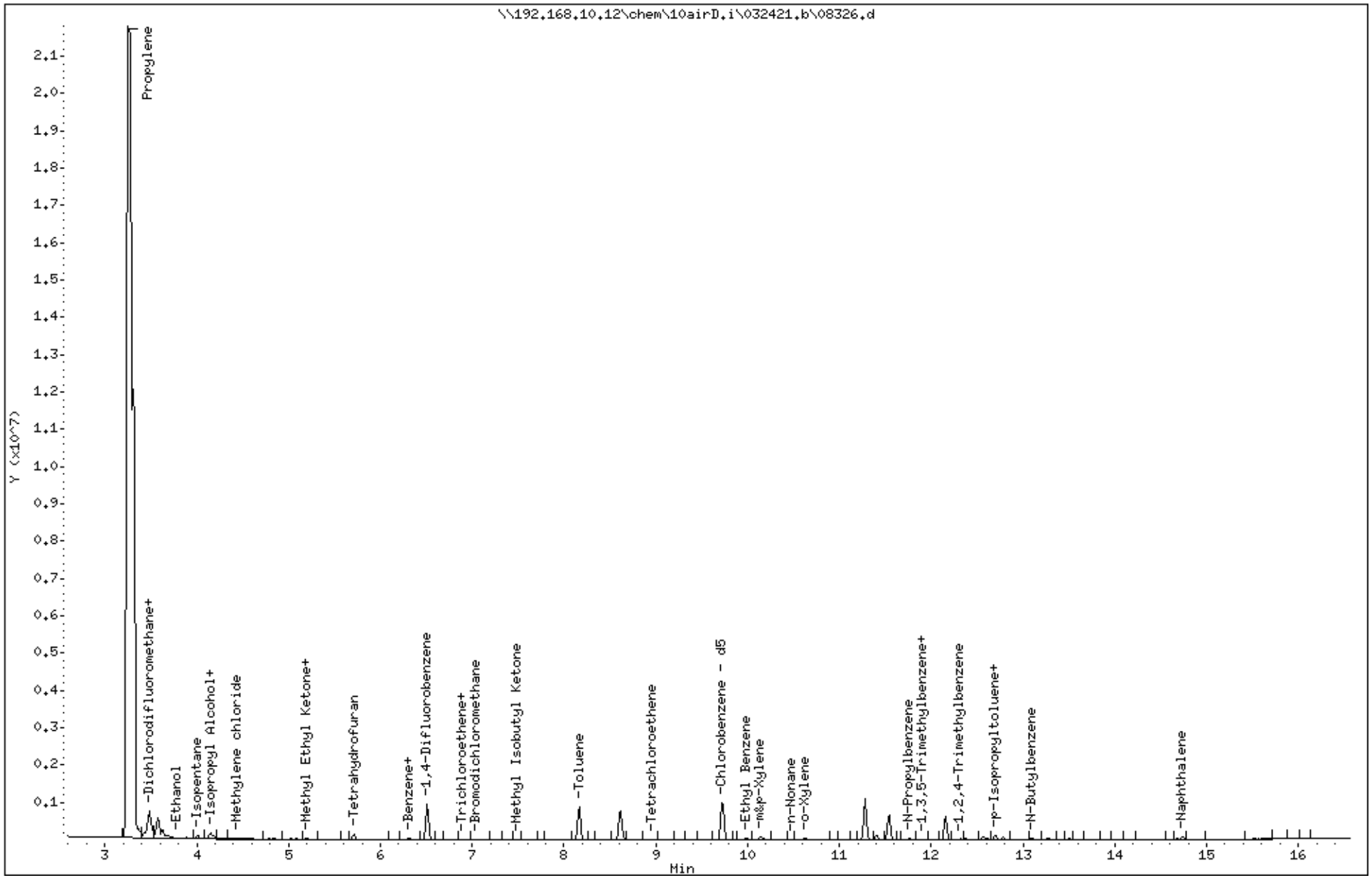
Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/KG) ppbv

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Data File: \\192.168.10.12\chem\10airD.i\032421.b\08326.d
Date : 24-MAR-2021 23:23
Client ID:
Sample Info:

Instrument: 10airD.i
Operator: GT
Column diameter: 0.32

Column phase: ZB-5MSplus SN338857



Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

May 26, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on May 10, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sylvia Hunter

Sylvia Hunter
sylvia.hunter@pacelabs.com
1(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10559600001	**SW27-MW01**	Water	05/10/21 11:30	05/10/21 16:00
10559600002	**SW27-MW02**	Water	05/10/21 13:50	05/10/21 16:00
10559600003	**SW27-MW02-D**	Water	05/10/21 14:20	05/10/21 16:00

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10559600001	**SW27-MW01**	WI MOD DRO	JVM	2
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1
10559600002	**SW27-MW02**	WI MOD DRO	JVM	2
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1
10559600003	**SW27-MW02-D**	WI MOD DRO	JVM	2
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1

PASI-M = Pace Analytical Services - Minneapolis

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Method: **WI MOD DRO**
Description: WIDRO LV GCS Silica Gel
Client: Bay West LLC
Date: May 26, 2021

General Information:
3 samples were analyzed for WI MOD DRO by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Method: **EPA 8270E by SIM**
Description: 8270E MSSV 14 Dioxane By SIM
Client: Bay West LLC
Date: May 26, 2021

General Information:
3 samples were analyzed for EPA 8270E by SIM by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA Mod. 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 741717

S0: Surrogate recovery outside laboratory control limits.

- BLANK (Lab ID: 3955309)
  - 1,4-Dioxane-d8 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 741717

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Method: **EPA 353.2**
Description: 353.2 Nitrate + Nitrite
Client: Bay West LLC
Date: May 26, 2021

General Information:
3 samples were analyzed for EPA 353.2 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Sample: SW27-MW01 **Lab ID: 10559600001** Collected: 05/10/21 11:30 Received: 05/10/21 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.098**	mg/L	0.098	0.028	1	05/13/21 08:24	05/14/21 10:49		
Surrogates									
n-Triacontane (S)	85	%.	34-125		1	05/13/21 08:24	05/14/21 10:49		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 09:59	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	38	%.	30-125		1	05/13/21 09:16	05/14/21 09:59		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**1.0**	mg/L	0.10	0.018	1		05/13/21 16:39		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Sample: SW27-MW02 **Lab ID: 10559600002** Collected: 05/10/21 13:50 Received: 05/10/21 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.098**	mg/L	0.098	0.028	1	05/13/21 08:24	05/14/21 10:56		
Surrogates									
n-Triacontane (S)	87	%.	34-125		1	05/13/21 08:24	05/14/21 10:56		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 10:16	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	39	%.	30-125		1	05/13/21 09:16	05/14/21 10:16		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.71**	mg/L	0.10	0.018	1		05/13/21 16:40		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Sample: SW27-MW02-D **Lab ID: 10559600003** Collected: 05/10/21 14:20 Received: 05/10/21 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.098**	mg/L	0.098	0.028	1	05/13/21 08:24	05/14/21 11:03		
Surrogates									
n-Triacontane (S)	82	%.	34-125		1	05/13/21 08:24	05/14/21 11:03		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 11:09	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	42	%.	30-125		1	05/13/21 09:16	05/14/21 11:09		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.90**	mg/L	0.10	0.018	1		05/13/21 16:41		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

QC Batch: 741717
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E Water 14 Dioxane by SIM
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559600001, 10559600002, 10559600003

METHOD BLANK: 3955309 Matrix: Water
Associated Lab Samples: 10559600001, 10559600002, 10559600003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (SIM)	ug/L	<0.25	0.25	0.11	05/14/21 08:49	
1,4-Dioxane-d8 (S)	%.	29	30-125		05/14/21 08:49	S0

LABORATORY CONTROL SAMPLE & LCSD: 3955310 3955311

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (SIM)	ug/L	10	9.2	9.5	92	95	59-134	4	20	
1,4-Dioxane-d8 (S)	%.				41	40	30-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

QC Batch: 741714
QC Batch Method: WI MOD DRO
Analysis Method: WI MOD DRO
Analysis Description: WIDRO Low Volume GCS w/Cleanup
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559600001, 10559600002, 10559600003

METHOD BLANK: 3955306 Matrix: Water
Associated Lab Samples: 10559600001, 10559600002, 10559600003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	<0.10	0.10	0.029	05/14/21 10:07	
n-Triacontane (S)	%.	87	34-125		05/14/21 10:07	

LABORATORY CONTROL SAMPLE & LCSD: 3955307 3955308

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	0.8	0.63	0.57	79	72	42-125	9	20	
n-Triacontane (S)	%.				85	77	34-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

QC Batch: 741818 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559600001, 10559600002, 10559600003

METHOD BLANK: 3955796 Matrix: Water
Associated Lab Samples: 10559600001, 10559600002, 10559600003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.10	0.10	0.018	05/13/21 16:36	FS

LABORATORY CONTROL SAMPLE: 3955797

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3955798 3955799

Parameter	Units	10559325001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.98	0.98	98	97	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3956655 3956656

Parameter	Units	10559719001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.031J	1	1	1.1	1.1	103	103	90-110	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 742050

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.

S0 Surrogate recovery outside laboratory control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559600

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10559600001	**SW27-MW01**	WI MOD DRO	741714	WI MOD DRO	742153
10559600002	**SW27-MW02**	WI MOD DRO	741714	WI MOD DRO	742153
10559600003	**SW27-MW02-D**	WI MOD DRO	741714	WI MOD DRO	742153
10559600001	**SW27-MW01**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559600002	**SW27-MW02**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559600003	**SW27-MW02-D**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559600001	**SW27-MW01**	EPA 353.2	741818		
10559600002	**SW27-MW02**	EPA 353.2	741818		
10559600003	**SW27-MW02-D**	EPA 353.2	741818		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10559600

10559600

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-607-6347
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

Work Order Number:	3000027125
Facility Code:	SW-27
Project Task Code:	PRJ07913
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives: HCl; NaOH; None; None; H2SO4

Requested Analysis: DRO with silica gel cleanup (Wt DRO); 2,3,7,8 TCD (Dioxin) - (EPA 8290A); 1,4-Dioxane (Analyzed as a single compound) - (8270 SIM); PFAS; Nitrate + Ntrite, as Nitrogen

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (Wt DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Ntrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	WG	NW	Wtr-Ground	5-10-21	1130	9	X	X	X	X	X	
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	5-10-21	1350	9	X	X	X	X	X	
3	~~847406~~	~~SW27-MW03~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	omit - II 5-10-21
4	~~847411~~	~~SW27-MW04~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	"
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
7	~~854578~~	~~SW27-MW07~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	"
8	~~854579~~	~~SW27-MW08~~	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	5-10-21	1420	9	X	X	X	X	X	
10	Equipment ~~Blank~~	~~SW27-EB01~~	QC-EB	G	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	"
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted T/ Bay West	5-10-21		Rogan S / Pace	5-10-21	1600

SAMPLE CONDITIONS			
Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
3.3/4.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Traeger

SIGNATURE of SAMPLER: Ted Traeger

DATE Signed (MM/DD/YY): 5-10-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10559600

PM: SH1 **Due Date: 05/24/21**

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☒Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ **See Exceptions** ☐ **ENV-FRM-MIN4-0142**

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☒T3(0459) ☐OS418-LS ☐T4(0254) ☐T5(0489) ☐160285052 **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☐No **Were All Container Temps Taken?** ☐Yes ☐No ☐N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 3.3, 4.1 °C

Correction Factor: _____ **Cooler Temp Corrected w/temp blank:** 3.3, 4.1 °C

Average Corrected Temp (no temp blank only): _____ °C ☐**See Exceptions ENV-FRM-MIN4-0142** ☐**1 Container**

USDA Regulated Soil: (☒N/A, water sample/Other:_____)

Date/Initials of Person Examining Contents: CS 5/11/21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes ☐No	1.
Chain of Custody Relinquished?	☒Yes ☐No	2.
Sampler Name and/or Signature on COC?	☒Yes ☐No ☐N/A	3.
Samples Arrived within Hold Time?	☒Yes ☐No	4.
Short Hold Time Analysis (<72 hr)?	☐Yes ☒No	5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes ☒No	6.
Sufficient Volume?	☒Yes ☐No	7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☐No ☒Yes ☐No	8.
Containers Intact?	☒Yes ☐No	9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes ☐No ☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒Water ☐Soil ☐Oil ☐Other_____	☒Yes ☐No	11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
All containers needing acid/base preservation have been checked?	☒Yes ☐No ☐N/A	12. Sample # 001-006 ~~006-004~~ 001-003 ☐NaOH ☒HNO_3 ☒H_2SO_4 ☐Zinc Acetate 1/1 1/1
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4) <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☒Yes ☐No ☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒Yes ☐No ☐N/A	Res. Chlorine: 0-6 Roll 221419; 0-6 Strip; 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes ☐No ☒N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐Yes ☐No ☒N/A	
Trip Blank Present?	☐Yes ☐No ☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes ☐No ☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

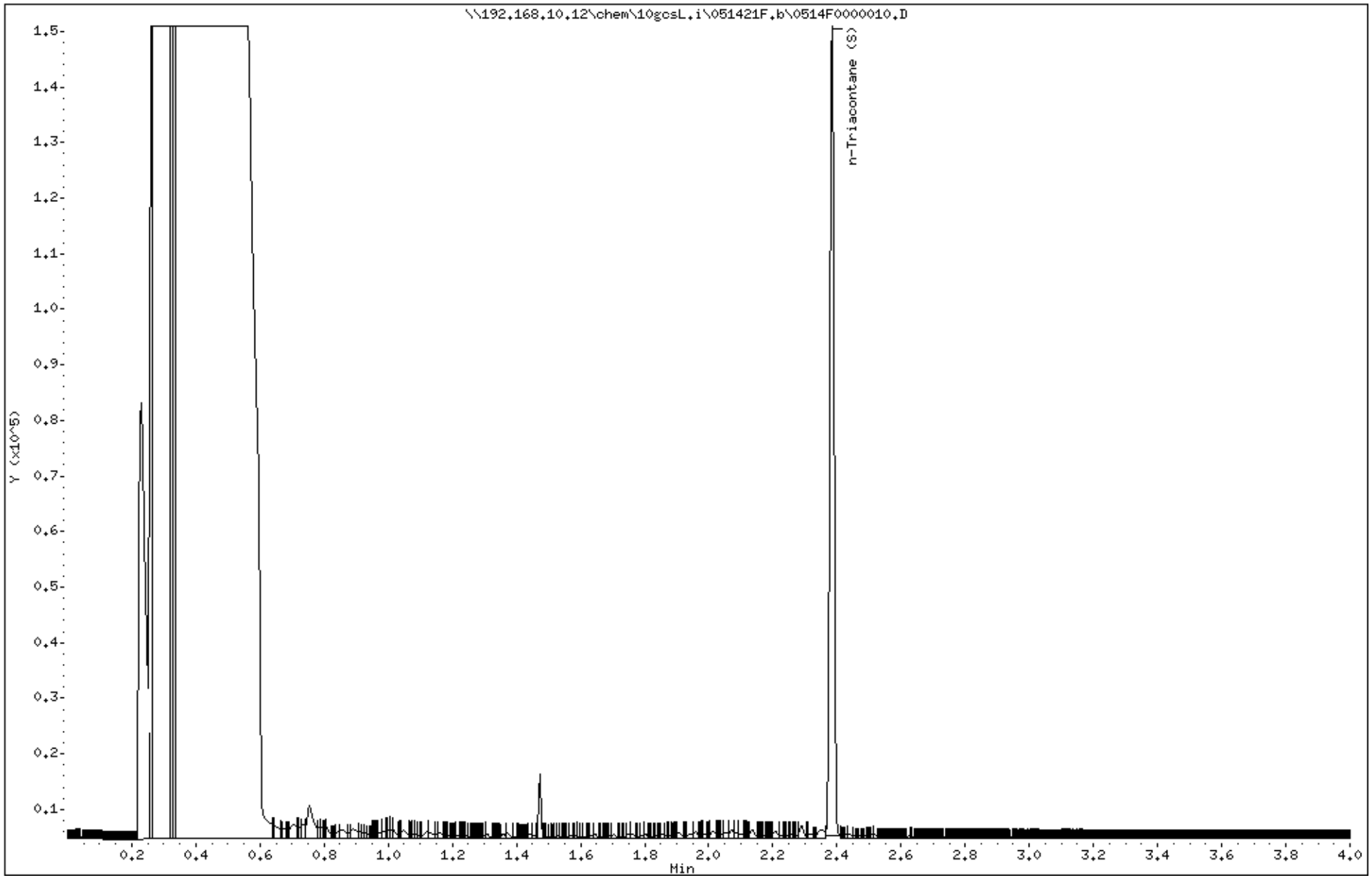
Project Manager Review: Jessica Hunter 5/12/21 **Date:** _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: FJD

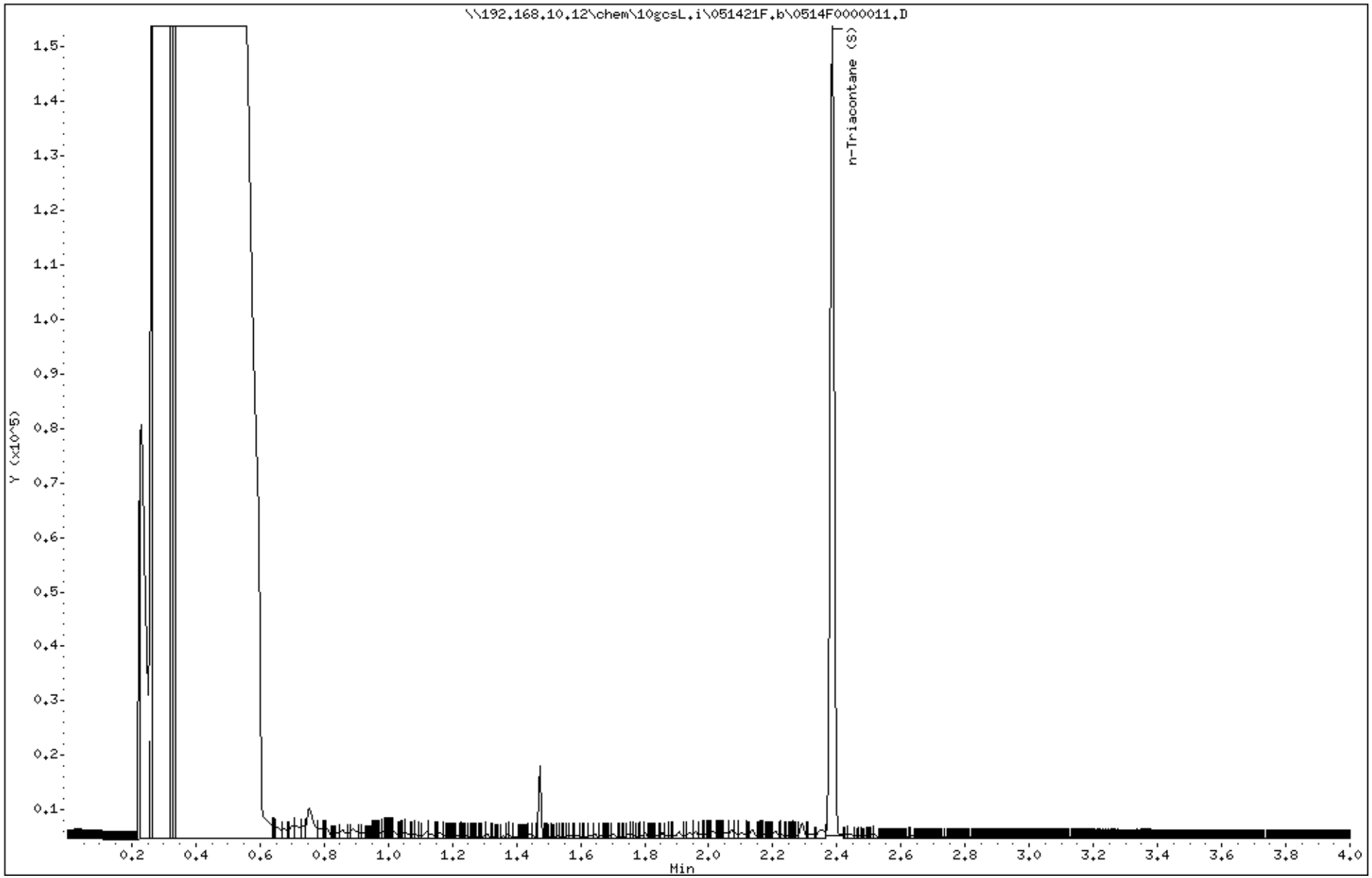
Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000010.D
Date : 14-MAY-2021 10:49
Client ID: SW27-MW01
Sample Info: 10559600001
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



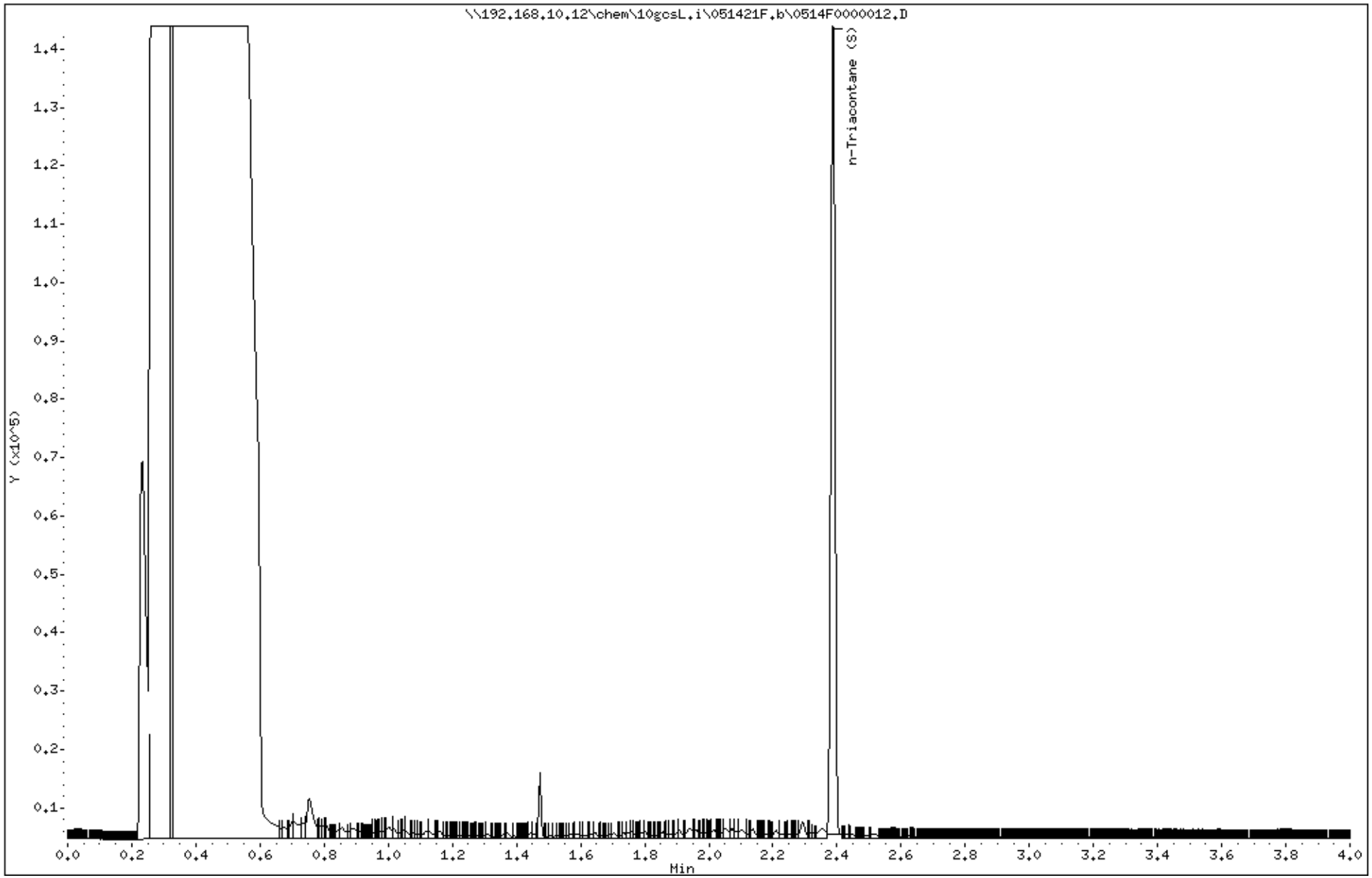
Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000011.D
Date : 14-MAY-2021 10:56
Client ID: SW27-MW02
Sample Info: 10559600002
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000012.D
Date : 14-MAY-2021 11:03
Client ID: SW27-MW02-D
Sample Info: 10559600003
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PFAAs

Report Information:

Pace Project #: 10559601
Sample Receipt Date: 05/10/2021
Client Project #: 200402 SW#27 Vadnais Heights
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Krista Carlson, your Pace Project Manager.

This report has been reviewed by:

June 01, 2021
Krista Carlson, Project Manager

(612) 607-1700 (fax)
krista.carlson@pacelabs.com

Report Prepared Date:
May 28, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

DISCUSSION

This report presents the results from the analysis performed on three samples, one duplicate, and one matrix spike submitted by a representative of Bay West LLC. The samples were analyzed for thirty-six perfluorinated compounds using MPCA Guidance. Reporting limits were set to the quantitation limits.

A laboratory method blank was prepared and analyzed with each sample batch as part of our routine quality control procedures. The results show the blanks to be free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

Laboratory spike sample was also prepared with the sample batch using clean reference matrix that had been fortified with native standards. The recovery results were within the method limits. The RPDs (relative percent differences) between one designated spike and its duplicate were within the method limits. These spikes indicate that extraction performed as expected.

Diminished extracted internal standard (EIS) recovery (outside the suggested limits) were present in the sample material, however, the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard.

On the matrix spike, several analytes marked "R" as the recoveries are elevated/diminished from the expected levels. This deviation may be due to the presence of the affected analytes in the sample material and/or sample inhomogeneity.

The four injection internal standards (13C4_PFOA, 13C4_PFOS, 13C2_PFDA, and 13C2_PFHxA) pass for each analysis in the batch verifying that the instrument detector is working as expected.

Results for selected analytes were taken from secondary dilutions of the sample extracts in order to bring the results within the calibration range. The affected values were flagged "D" on the results tables. Values were flagged "I" where incorrect isotope ratios were obtained.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10559601

10559601

001

Report No.....10559601_ID36_DFR

Page 5 of 40

Section A (Required Client Information)		Section B (Required Project Information)		Section C (Invoice Information)		Section D (Laboratory Information)	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-607-6347
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

COC ID:	
Work Order Number	3000027125
Facility Code:	SW-27
Project Task Code:	PRJ07913
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives: HCl; none; none; none; H2SO4

Requested Analysis: DRO with silica gel cleanup (WI DRO); 2,3,7,8 TCD (Dioxin) - (EPA 8290A); 1,4-Dioxane (Analyzed as a single compound) - (8270 SIM); PFAS; Nitrate + Nitrite, as Nitrogen

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	WG	NW	Wtr-Ground	5-10-21	1130	9	X	X	X	X	X	
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	5-10-21	1350	9	X	X	X	X	X	
3	~~847406~~	~~SW27-MW03~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	omit - TT 5-10-21
4	~~847411~~	~~SW27-MW04~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	"
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	5-10-21	1420	9	X	X	X	X	X	
10	Equipment Blank	~~SW27-EB01~~	QC-EB	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted T/ Bay West	5-10-21		Raynn S / Pace	5-10-21	1600

SAMPLE CONDITIONS			
Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
3.3/4.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Traget

SIGNATURE of SAMPLER: Ted Traget

DATE Signed (MM/DD/YY): 5-10-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: **WO#: 10559601**

PM: KAC Due Date: 05/24/21
CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☒Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☒T3(0459) ☐OS418-LS ☐T4(0254) ☐T5(0489) ☐160285052 **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☐No **Were All Container Temps Taken?** ☐Yes ☐No ☐N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 3.3, 4.1 °C

Average Corrected Temp (no temp blank only): _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

Correction Factor: TRK **Cooler Temp Corrected w/temp blank:** 3.3, 4.1 °C

USDA Regulated Soil: (☒ N/A, water sample/Other:_____)

Date/Initials of Person Examining Contents: CS 5/11/21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		8.
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒Water ☐Soil ☐Oil ☐Other_____	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted:_____ Date/Time:_____

Comments/Resolution:_____

Project Manager Review: _____ **Date:** 05/12/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: TJD

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601001	Total Amount Extracted	523mL
Lab File ID	A210517B_010	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 11:30	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	24.1	0.478	0.478	0.143	1	375-22-4	
PFPeA	8.50	0.478	0.478	0.094	1	2706-90-3	
HFPO-DA	ND	0.478	0.478	0.089	1	13252-13-6	
PFBS	6.82	0.423	0.423	0.097	1	375-73-5	
PFHxA	12.3	0.478	0.478	0.107	1	307-24-4	
4:2 FTS	ND	0.447	0.447	0.142	1	757124-72-4	
PFPeS	6.30	0.449	0.449	0.112	1	2706-91-4	
PFHpA	3.90	0.478	0.478	0.132	1	375-85-9	
DONA	ND	0.452	0.452	0.115	1	919005-14-4	
PFHxS	127 D	2.17	2.17	0.371	5	355-46-4	
PFOA	19.3	0.478	0.478	0.085	1	335-67-1	
6:2 FTS	1.33	0.454	0.454	0.149	1	27619-97-2	
PFHpS	4.04	0.454	0.454	0.113	1	375-92-8	
PFNA	ND	0.478	0.478	0.086	1	375-95-1	
PFOSAm	ND	0.478	0.478	0.103	1	754-91-6	
PFOS	102 D	2.21	2.21	0.434	5	1763-23-1	
MeFOSA	ND	0.478	0.478	0.154	1	31506-32-8	
PFDA	ND	0.478	0.478	0.115	1	335-76-2	
EtFOSAm	ND	0.478	0.478	0.144	1	4151-50-2	
8:2 FTS	ND	0.459	0.459	0.149	1	39108-34-4	
9-Cl-PF3ON	ND	0.445	0.445	0.131	1	756426-58-1	
PFNS	ND	0.459	0.459	0.103	1	68259-12-1	
PFUnDA	ND	0.478	0.478	0.159	1	2058-94-8	
NMeFOSAA	ND	0.478	0.478	0.138	1	2355-31-9	
NEtFOSAA	ND	0.478	0.478	0.128	1	2991-50-6	
PFDS	ND	0.461	0.461	0.111	1	335-77-3	
PFDOA	ND	0.478	0.478	0.155	1	307-55-1	
MeFOSE	ND	0.478	0.478	0.103	1	24448-09-7	
10:2 FTS	ND	0.461	0.461	0.121	1	120226-60-0	
EtFOSE	ND	0.478	0.478	0.131	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.450	0.450	0.116	1	763051-92-9	
PFTrDA	ND	0.478	0.478	0.156	1	72629-94-8	
PFDoS	ND	0.463	0.463	0.120	1	79780-39-5	
PFTDA	ND	0.478	0.478	0.078	1	376-06-7	
PFHXDA	ND	0.478	0.478	0.119	1	67905-19-5	
PFODA	ND	0.478	0.478	0.157	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601001	Total Amount Extracted	523mL
Lab File ID	A210517B_010	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 11:30	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.56	9.02	94	50-200	
13C4_PFOA	9.56	9.43	99	50-200	
13C2_PFDA	9.56	10.0	105	50-200	
13C4_PFOS	9.15	8.49	93	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.56	7.36	77	50-200	
13C5_PFPeA	9.56	8.09	85	50-200	
13C3_PFBS	8.88	7.71	87	50-200	
13C2_4:2FTS	8.94	13.3	148	50-200	
13C5_PFHxA	9.56	8.77	92	50-200	
13C4_PFHpA	9.56	9.84	103	50-200	
13C3_PFHxS	9.04	7.77	86	50-200	
13C2_6:2FTS	9.07	11.8	130	50-200	
13C8_PFOA	9.56	8.97	94	50-200	
13C9_PFNA	9.56	9.56	100	50-200	
13C8_PFOS	9.15	8.09	88	50-200	
13C2_8:2FTS	9.16	10.5	115	50-200	
13C6_PFDA	9.56	9.24	97	50-200	
d3-MeFOSAA	9.56	11.5	120	50-200	
13C8_PFOSA	9.56	5.06	53	50-200	
d5-EtFOSAA	9.56	9.27	97	50-200	
13C7_PFUdA	9.56	11.2	117	50-200	
13C2_PFDoA	9.56	10.3	108	50-200	
13C2_PFTeDA	9.56	8.01	84	50-200	
13C3_HFPO-DA	9.56	8.30	87	50-200	
13C2_PFHxDA	9.56	7.03	73	50-200	
d7-N-MeFOSE	9.56	4.95	52	50-200	
d9-N-EtFOSE	9.56	4.96	52	50-200	
d3-N-MeFOSA	9.56	4.19	**44**	50-200	R
d5-N-EtFOSA	9.56	4.26	**45**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601001	Total Amount Extracted	523mL
Lab File ID	A210517B_010	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 11:30	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.21	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFHpA	N/A	N/A	5.55	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.87	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.83	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.26	10.23	R
d5-N-EtFOSA	N/A	N/A	10.92	10.89	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW01	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601001	Total Amount Extracted	523mL
Lab File ID	A210517B_010	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 11:30	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.57	3.57	
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.310	0.450	5.26	5.25	
PFBS	0.340	0.320	5.22	5.22	
PFHxA	0.066	0.0610	5.04	5.04	
4:2 FTS	0.000	0.550	4.81	4.80	
PFPeS	0.340	0.300	5.81	5.80	
PFHpA	0.310	0.310	5.56	5.56	
DONA	0.990	0.480	5.74	5.73	
PFHxS	0.250	0.270	6.33	6.35	D
PFOA	0.390	0.360	6.03	6.03	
6:2 FTS	0.550	0.580	5.79	5.79	
PFHpS	0.240	0.230	6.80	6.80	
PFNA	0.220	0.200	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.170	0.220	7.17	7.29	D
MeFOSA	0.860	0.860	10.27	10.25	
PFDA	0.130	0.0980	6.94	6.95	
EtFOSAm	0.000	0.720	0.00	10.92	
8:2 FTS	1.20	0.670	6.68	6.69	
9-Cl-PF3ON	0.000	0.0220	7.58	7.59	
PFNS	0.000	0.250	0.00	7.71	
PFUnDA	0.170	0.0940	7.38	7.39	
NMeFOSAA	1.60	0.560	6.87	6.89	
NEtFOSAA	0.000	0.700	7.09	7.10	
PFDS	0.000	0.230	8.14	8.14	
PFDOA	0.150	0.150	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.630	0.00	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.000	0.0130	8.43	8.44	
PFTrDA	0.220	0.140	8.27	8.26	
PFDoS	0.000	0.230	9.19	8.93	
PFTDA	0.170	0.140	8.68	8.68	
PFHXDA	0.120	0.120	9.44	9.44	
PFODA	0.036	0.100	10.52	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002	Total Amount Extracted	514mL
Lab File ID	A210517B_011	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 13:50	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	74.1	0.486	0.486	0.146	1	375-22-4	
PFPeA	9.77	0.486	0.486	0.096	1	2706-90-3	
HFPO-DA	ND	0.486	0.486	0.091	1	13252-13-6	
PFBS	2.57	0.431	0.431	0.099	1	375-73-5	
PFHxA	5.29	0.486	0.486	0.109	1	307-24-4	
4:2 FTS	ND	0.455	0.455	0.145	1	757124-72-4	
PFPeS	ND	0.457	0.457	0.114	1	2706-91-4	
PFHpA	1.85	0.486	0.486	0.134	1	375-85-9	
DONA	ND	0.460	0.460	0.117	1	919005-14-4	
PFHxS	0.809	0.443	0.443	0.075	1	355-46-4	
PFOA	11.0	0.486	0.486	0.086	1	335-67-1	
6:2 FTS	ND	0.462	0.462	0.152	1	27619-97-2	
PFHpS	ND	0.462	0.462	0.115	1	375-92-8	
PFNA	ND	0.486	0.486	0.088	1	375-95-1	
PFOSAm	ND	0.486	0.486	0.105	1	754-91-6	
PFOS	1.18 I	0.450	0.450	0.088	1	1763-23-1	
MeFOSA	ND	0.486	0.486	0.157	1	31506-32-8	
PFDA	ND	0.486	0.486	0.117	1	335-76-2	
EtFOSAm	ND	0.486	0.486	0.147	1	4151-50-2	
8:2 FTS	ND	0.467	0.467	0.152	1	39108-34-4	
9-Cl-PF3ON	ND	0.453	0.453	0.133	1	756426-58-1	
PFNS	ND	0.467	0.467	0.105	1	68259-12-1	
PFUnDA	ND	0.486	0.486	0.162	1	2058-94-8	
NMeFOSAA	ND	0.486	0.486	0.140	1	2355-31-9	
NEtFOSAA	ND	0.486	0.486	0.130	1	2991-50-6	
PFDS	ND	0.469	0.469	0.113	1	335-77-3	
PFDOA	ND	0.486	0.486	0.158	1	307-55-1	
MeFOSE	ND	0.486	0.486	0.105	1	24448-09-7	
10:2 FTS	ND	0.469	0.469	0.124	1	120226-60-0	
EtFOSE	ND	0.486	0.486	0.133	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.458	0.458	0.118	1	763051-92-9	
PFTrDA	ND	0.486	0.486	0.159	1	72629-94-8	
PFDoS	ND	0.471	0.471	0.123	1	79780-39-5	
PFTDA	ND	0.486	0.486	0.080	1	376-06-7	
PFHXDA	ND	0.486	0.486	0.122	1	67905-19-5	
PFODA	ND	0.486	0.486	0.160	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002	Total Amount Extracted	514mL
Lab File ID	A210517B_011	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 13:50	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.73	9.36	96	50-200	
13C4_PFOA	9.73	10.4	107	50-200	
13C2_PFDA	9.73	10.7	110	50-200	
13C4_PFOS	9.31	9.12	98	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.73	7.16	74	50-200	
13C5_PFPeA	9.73	8.00	82	50-200	
13C3_PFBS	9.04	8.40	93	50-200	
13C2_4:2FTS	9.10	14.0	154	50-200	
13C5_PFHxA	9.73	9.43	97	50-200	
13C4_PFHpA	9.73	10.4	107	50-200	
13C3_PFHxS	9.20	9.68	105	50-200	
13C2_6:2FTS	9.23	15.8	171	50-200	
13C8_PFOA	9.73	9.94	102	50-200	
13C9_PFNA	9.73	10.1	104	50-200	
13C8_PFOS	9.31	9.37	101	50-200	
13C2_8:2FTS	9.32	12.9	139	50-200	
13C6_PFDA	9.73	10.7	110	50-200	
d3-MeFOSAA	9.73	12.1	125	50-200	
13C8_PFOSA	9.73	5.61	58	50-200	
d5-EtFOSAA	9.73	10.9	112	50-200	
13C7_PFUdA	9.73	12.0	123	50-200	
13C2_PFDoA	9.73	12.2	125	50-200	
13C2_PFTeDA	9.73	8.84	91	50-200	
13C3_HFPO-DA	9.73	8.52	88	50-200	
13C2_PFHxDA	9.73	7.62	78	50-200	
d7-N-MeFOSE	9.73	5.51	57	50-200	
d9-N-EtFOSE	9.73	5.33	55	50-200	
d3-N-MeFOSA	9.73	5.22	54	50-200	
d5-N-EtFOSA	9.73	5.38	55	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002	Total Amount Extracted	514mL
Lab File ID	A210517B_011	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 13:50	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.21	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFHpA	N/A	N/A	5.56	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.49	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.88	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.83	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.26	10.23	
d5-N-EtFOSA	N/A	N/A	10.92	10.89	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002	Total Amount Extracted	514mL
Lab File ID	A210517B_011	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 13:50	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.56	3.57	
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.520	0.450	5.26	5.25	
PFBS	0.330	0.320	5.22	5.22	
PFHxA	0.067	0.0610	5.04	5.04	
4:2 FTS	0.000	0.550	4.80	4.80	
PFPeS	0.310	0.300	5.81	5.80	
PFHpA	0.310	0.310	5.56	5.56	
DONA	0.180	0.480	5.74	5.73	
PFHxS	0.230	0.250	6.32	6.32	
PFOA	0.410	0.360	6.03	6.03	
6:2 FTS	0.550	0.580	5.79	5.79	
PFHpS	0.310	0.230	6.80	6.80	
PFNA	0.190	0.200	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.110	0.230	7.08	7.27	I
MeFOSA	0.950	0.860	10.28	10.25	
PFDA	0.098	0.0980	6.94	6.95	
EtFOSAm	0.180	0.720	10.96	10.92	
8:2 FTS	0.000	0.670	0.00	6.69	
9-Cl-PF3ON	0.000	0.0220	0.00	7.59	
PFNS	0.000	0.250	0.00	7.71	
PFUnDA	0.280	0.0940	7.38	7.39	
NMeFOSAA	0.890	0.560	6.88	6.89	
NEtFOSAA	0.000	0.700	0.00	7.10	
PFDS	0.260	0.230	8.14	8.14	
PFDOA	0.110	0.150	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.630	0.00	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.000	0.0130	8.45	8.44	
PFTrDA	0.190	0.140	8.27	8.26	
PFDoS	0.000	0.230	8.93	8.93	
PFTDA	0.130	0.140	8.68	8.68	
PFHXDA	0.110	0.120	9.44	9.44	
PFODA	0.200	0.100	10.52	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-DUP	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002-DUP	Total Amount Extracted	474mL
Lab File ID	A210517B_015	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/10/2021 13:50	Ending CCal File	A210517B_032
Received	05/10/2021 16:00	Blank File	A210517B_004

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	77.6	0.527	0.527	0.158	1	375-22-4	
PFPeA	10.1	0.527	0.527	0.104	1	2706-90-3	
HFPO-DA	ND	0.527	0.527	0.098	1	13252-13-6	
PFBS	2.68	0.466	0.466	0.107	1	375-73-5	
PFHxA	5.37	0.527	0.527	0.118	1	307-24-4	
4:2 FTS	ND	0.493	0.493	0.157	1	757124-72-4	
PFPeS	ND	0.495	0.495	0.123	1	2706-91-4	
PFHpA	1.91	0.527	0.527	0.145	1	375-85-9	
DONA	ND	0.498	0.498	0.126	1	919005-14-4	
PFHxS	0.890	0.480	0.480	0.081	1	355-46-4	
PFOA	11.7	0.527	0.527	0.094	1	335-67-1	
6:2 FTS	ND	0.501	0.501	0.164	1	27619-97-2	
PFHpS	ND	0.501	0.501	0.124	1	375-92-8	
PFNA	ND	0.527	0.527	0.095	1	375-95-1	
PFOSAm	ND	0.527	0.527	0.114	1	754-91-6	
PFOS	1.21 I	0.487	0.487	0.095	1	1763-23-1	
MeFOSA	ND	0.527	0.527	0.170	1	31506-32-8	
PFDA	ND	0.527	0.527	0.126	1	335-76-2	
EtFOSAm	ND	0.527	0.527	0.159	1	4151-50-2	
8:2 FTS	ND	0.506	0.506	0.164	1	39108-34-4	
9-Cl-PF3ON	ND	0.491	0.491	0.144	1	756426-58-1	
PFNS	ND	0.506	0.506	0.114	1	68259-12-1	
PFUnDA	ND	0.527	0.527	0.175	1	2058-94-8	
NMeFOSAA	ND	0.527	0.527	0.152	1	2355-31-9	
NEtFOSAA	ND	0.527	0.527	0.141	1	2991-50-6	
PFDS	ND	0.509	0.509	0.122	1	335-77-3	
PFDOA	ND	0.527	0.527	0.171	1	307-55-1	
MeFOSE	ND	0.527	0.527	0.114	1	24448-09-7	
10:2 FTS	ND	0.508	0.508	0.134	1	120226-60-0	
EtFOSE	ND	0.527	0.527	0.144	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.496	0.496	0.128	1	763051-92-9	
PFTrDA	ND	0.527	0.527	0.172	1	72629-94-8	
PFDoS	ND	0.510	0.510	0.133	1	79780-39-5	
PFTDA	ND	0.527	0.527	0.086	1	376-06-7	
PFHXDA	ND	0.527	0.527	0.132	1	67905-19-5	
PFODA	ND	0.527	0.527	0.173	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-DUP	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002-DUP	Total Amount Extracted	474mL
Lab File ID	A210517B_015	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/10/2021 13:50	Ending CCal File	A210517B_032
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.5	11.5	109	50-200	
13C4_PFOA	10.5	12.2	116	50-200	
13C2_PFDA	10.5	13.2	125	50-200	
13C4_PFOS	10.1	11.0	109	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.5	7.71	73	50-200	
13C5_PFPeA	10.5	9.10	86	50-200	
13C3_PFBS	9.79	9.39	96	50-200	
13C2_4:2FTS	9.85	15.4	157	50-200	
13C5_PFHxA	10.5	10.6	101	50-200	
13C4_PFHpA	10.5	11.6	110	50-200	
13C3_PFHxS	9.97	10.6	107	50-200	
13C2_6:2FTS	10.0	15.6	156	50-200	
13C8_PFOA	10.5	10.8	103	50-200	
13C9_PFNA	10.5	11.7	111	50-200	
13C8_PFOS	10.1	10.4	103	50-200	
13C2_8:2FTS	10.1	13.4	132	50-200	
13C6_PFDA	10.5	12.3	117	50-200	
d3-MeFOSAA	10.5	14.7	139	50-200	
13C8_PFOSA	10.5	6.30	60	50-200	
d5-EtFOSAA	10.5	12.1	115	50-200	
13C7_PFUdA	10.5	13.5	128	50-200	
13C2_PFDoA	10.5	13.0	123	50-200	
13C2_PFTeDA	10.5	10.0	95	50-200	
13C3_HFPO-DA	10.5	9.66	92	50-200	
13C2_PFHxDA	10.5	8.74	83	50-200	
d7-N-MeFOSE	10.5	6.40	61	50-200	
d9-N-EtFOSE	10.5	6.32	60	50-200	
d3-N-MeFOSA	10.5	6.07	58	50-200	
d5-N-EtFOSA	10.5	6.24	59	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-DUP	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002-DUP	Total Amount Extracted	474mL
Lab File ID	A210517B_015	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/10/2021 13:50	Ending CCal File	A210517B_032
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.04	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.43	4.42	
13C3_PFBS	N/A	N/A	5.22	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.04	5.03	
13C4_PFHpA	N/A	N/A	5.56	5.55	
13C3_PFHxS	N/A	N/A	6.32	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.49	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.94	6.94	
d3-MeFOSAA	N/A	N/A	6.88	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.83	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.26	10.23	
d5-N-EtFOSA	N/A	N/A	10.92	10.89	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-DUP	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601002-DUP	Total Amount Extracted	474mL
Lab File ID	A210517B_015	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/10/2021 13:50	Ending CCal File	A210517B_032
Received	05/10/2021 16:00	Blank File	A210517B_004

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.57	3.57	
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.450	0.450	5.26	5.25	
PFBS	0.320	0.330	5.22	5.22	
PFHxA	0.065	0.0660	5.05	5.04	
4:2 FTS	0.000	0.580	4.81	4.80	
PFPeS	0.320	0.310	5.81	5.80	
PFHpA	0.300	0.300	5.56	5.56	
DONA	0.570	0.530	5.74	5.73	
PFHxS	0.230	0.270	6.32	6.32	
PFOA	0.400	0.390	6.04	6.03	
6:2 FTS	0.620	0.460	5.80	5.79	
PFHpS	0.270	0.230	6.80	6.80	
PFNA	0.190	0.210	6.49	6.49	
PFOSAm	N/A	N/A	8.79	8.75	
PFOS	0.097	0.220	7.08	7.27	I
MeFOSA	0.850	0.870	10.28	10.25	
PFDA	0.130	0.0940	6.94	6.95	
EtFOSAm	0.630	0.720	10.96	10.92	
8:2 FTS	0.000	0.630	6.69	6.69	
9-Cl-PF3ON	0.000	0.0230	7.59	7.59	
PFNS	0.000	0.260	0.00	7.71	
PFUnDA	0.160	0.100	7.38	7.39	
NMeFOSAA	0.330	0.570	6.89	6.89	
NEtFOSAA	2.20	0.720	7.09	7.10	
PFDS	0.260	0.240	8.14	8.14	
PFDOA	0.050	0.130	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.720	7.56	7.58	
EtFOSE	0.000	0.000	10.67	10.64	
11-Cl-PF3OUdS	0.000	0.0140	8.45	8.44	
PFTrDA	0.240	0.150	8.27	8.26	
PFDoS	0.310	0.230	8.93	8.93	
PFTDA	0.050	0.130	8.69	8.68	
PFHXDA	0.130	0.120	9.44	9.44	
PFODA	0.042	0.100	10.52	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601003	Total Amount Extracted	511mL
Lab File ID	A210517B_012	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 14:20	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	76.6	0.490	0.490	0.147	1	375-22-4	
PFPeA	10.6	0.490	0.490	0.096	1	2706-90-3	
HFPO-DA	ND	0.490	0.490	0.091	1	13252-13-6	
PFBS	2.63	0.433	0.433	0.099	1	375-73-5	
PFHxA	5.73	0.490	0.490	0.110	1	307-24-4	
4:2 FTS	ND	0.458	0.458	0.146	1	757124-72-4	
PFPeS	ND	0.460	0.460	0.115	1	2706-91-4	
PFHpA	2.13	0.490	0.490	0.135	1	375-85-9	
DONA	ND	0.463	0.463	0.117	1	919005-14-4	
PFHxS	0.882	0.446	0.446	0.076	1	355-46-4	
PFOA	12.1	0.490	0.490	0.087	1	335-67-1	
6:2 FTS	ND	0.465	0.465	0.153	1	27619-97-2	
PFHpS	ND	0.465	0.465	0.116	1	375-92-8	
PFNA	ND	0.490	0.490	0.088	1	375-95-1	
PFOSAm	ND	0.490	0.490	0.106	1	754-91-6	
PFOS	1.24 I	0.453	0.453	0.088	1	1763-23-1	
MeFOSA	ND	0.490	0.490	0.158	1	31506-32-8	
PFDA	ND	0.490	0.490	0.117	1	335-76-2	
EtFOSAm	ND	0.490	0.490	0.148	1	4151-50-2	
8:2 FTS	ND	0.470	0.470	0.153	1	39108-34-4	
9-Cl-PF3ON	ND	0.456	0.456	0.134	1	756426-58-1	
PFNS	ND	0.470	0.470	0.106	1	68259-12-1	
PFUnDA	ND	0.490	0.490	0.163	1	2058-94-8	
NMeFOSAA	ND	0.490	0.490	0.141	1	2355-31-9	
NEtFOSAA	ND	0.490	0.490	0.131	1	2991-50-6	
PFDS	ND	0.472	0.472	0.114	1	335-77-3	
PFDOA	ND	0.490	0.490	0.159	1	307-55-1	
MeFOSE	ND	0.490	0.490	0.106	1	24448-09-7	
10:2 FTS	ND	0.472	0.472	0.124	1	120226-60-0	
EtFOSE	ND	0.490	0.490	0.134	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.461	0.461	0.118	1	763051-92-9	
PFTrDA	ND	0.490	0.490	0.160	1	72629-94-8	
PFDoS	ND	0.474	0.474	0.123	1	79780-39-5	
PFTDA	ND	0.490	0.490	0.080	1	376-06-7	
PFHXDA	ND	0.490	0.490	0.122	1	67905-19-5	
PFODA	ND	0.490	0.490	0.161	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601003	Total Amount Extracted	511mL
Lab File ID	A210517B_012	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 14:20	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.79	10.1	103	50-200	
13C4_PFOA	9.79	11.1	113	50-200	
13C2_PFDA	9.79	12.0	123	50-200	
13C4_PFOS	9.37	10.5	112	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.79	7.34	75	50-200	
13C5_PFPeA	9.79	8.47	87	50-200	
13C3_PFBS	9.10	8.94	98	50-200	
13C2_4:2FTS	9.16	14.8	162	50-200	
13C5_PFHxA	9.79	10.4	106	50-200	
13C4_PFHpA	9.79	10.8	110	50-200	
13C3_PFHxS	9.26	10.1	109	50-200	
13C2_6:2FTS	9.29	15.5	167	50-200	
13C8_PFOA	9.79	10.5	108	50-200	
13C9_PFNA	9.79	11.0	112	50-200	
13C8_PFOS	9.37	10.1	108	50-200	
13C2_8:2FTS	9.38	12.3	131	50-200	
13C6_PFDA	9.79	11.7	120	50-200	
d3-MeFOSAA	9.79	13.0	133	50-200	
13C8_PFOSA	9.79	5.79	59	50-200	
d5-EtFOSAA	9.79	10.7	109	50-200	
13C7_PFUdA	9.79	12.9	131	50-200	
13C2_PFDoA	9.79	12.6	128	50-200	
13C2_PFTeDA	9.79	9.51	97	50-200	
13C3_HFPO-DA	9.79	9.23	94	50-200	
13C2_PFHxDA	9.79	8.37	85	50-200	
d7-N-MeFOSE	9.79	5.60	57	50-200	
d9-N-EtFOSE	9.79	5.75	59	50-200	
d3-N-MeFOSA	9.79	5.08	52	50-200	
d5-N-EtFOSA	9.79	5.04	51	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601003	Total Amount Extracted	511mL
Lab File ID	A210517B_012	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 14:20	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.04	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.94	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.57	3.56	
13C5_PFPeA	N/A	N/A	4.43	4.42	
13C3_PFBS	N/A	N/A	5.22	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.04	5.03	
13C4_PFHpA	N/A	N/A	5.56	5.55	
13C3_PFHxS	N/A	N/A	6.32	6.31	
13C2_6:2FTS	N/A	N/A	5.80	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.49	6.49	
13C8_PFOS	N/A	N/A	7.26	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.94	6.94	
d3-MeFOSAA	N/A	N/A	6.88	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.83	7.83	
13C2_PFTeDA	N/A	N/A	8.69	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.45	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	
d9-N-EtFOSE	N/A	N/A	10.62	10.59	
d3-N-MeFOSA	N/A	N/A	10.26	10.23	
d5-N-EtFOSA	N/A	N/A	10.92	10.89	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW02-D	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559601003	Total Amount Extracted	511mL
Lab File ID	A210517B_012	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_002
Collected	05/10/2021 14:20	Ending CCal File	A210517B_014
Received	05/10/2021 16:00	Blank File	A210517B_004

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.57	3.57	
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.540	0.450	5.26	5.25	
PFBS	0.330	0.320	5.23	5.22	
PFHxA	0.063	0.0610	5.05	5.04	
4:2 FTS	0.000	0.550	4.81	4.80	
PFPeS	0.320	0.300	5.81	5.80	
PFHpA	0.290	0.310	5.56	5.56	
DONA	0.560	0.480	5.74	5.73	
PFHxS	0.250	0.250	6.32	6.32	
PFOA	0.400	0.360	6.04	6.03	
6:2 FTS	0.450	0.580	5.80	5.79	
PFHpS	0.280	0.230	6.80	6.80	
PFNA	0.210	0.200	6.49	6.49	
PFOSAm	N/A	N/A	8.79	8.75	
PFOS	0.100	0.230	7.08	7.27	I
MeFOSA	0.930	0.860	10.29	10.25	
PFDA	0.098	0.0980	6.94	6.95	
EtFOSAm	0.660	0.720	10.95	10.92	
8:2 FTS	0.000	0.670	6.69	6.69	
9-Cl-PF3ON	0.000	0.0220	7.60	7.59	
PFNS	0.310	0.250	7.73	7.71	
PFUnDA	0.250	0.0940	7.39	7.39	
NMeFOSAA	0.600	0.560	6.89	6.89	
NEtFOSAA	0.000	0.700	7.05	7.10	
PFDS	0.000	0.230	8.14	8.14	
PFDOA	0.087	0.150	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.630	0.00	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.000	0.0130	8.45	8.44	
PFTrDA	0.160	0.140	8.28	8.26	
PFDoS	0.250	0.230	8.94	8.93	
PFTDA	0.180	0.140	8.69	8.68	
PFHXDA	0.130	0.120	9.45	9.44	
PFODA	0.028	0.100	10.53	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	ND	0.495	0.495	0.148	1	375-22-4	
PFPeA	ND	0.495	0.495	0.097	1	2706-90-3	
HFPO-DA	ND	0.495	0.495	0.092	1	13252-13-6	
PFBS	ND	0.438	0.438	0.101	1	375-73-5	
PFHxA	ND	0.495	0.495	0.111	1	307-24-4	
4:2 FTS	ND	0.463	0.463	0.148	1	757124-72-4	
PFPeS	ND	0.465	0.465	0.116	1	2706-91-4	
PFHpA	ND	0.495	0.495	0.137	1	375-85-9	
DONA	ND	0.468	0.468	0.119	1	919005-14-4	
PFHxS	ND	0.450	0.450	0.076	1	355-46-4	
PFOA	ND	0.495	0.495	0.088	1	335-67-1	
6:2 FTS	ND	0.470	0.470	0.154	1	27619-97-2	
PFHpS	ND	0.470	0.470	0.117	1	375-92-8	
PFNA	ND	0.495	0.495	0.089	1	375-95-1	
PFOSAm	ND	0.495	0.495	0.107	1	754-91-6	
PFOS	ND	0.458	0.458	0.089	1	1763-23-1	
MeFOSA	ND	0.495	0.495	0.159	1	31506-32-8	
PFDA	ND	0.495	0.495	0.119	1	335-76-2	
EtFOSAm	ND	0.495	0.495	0.149	1	4151-50-2	
8:2 FTS	ND	0.475	0.475	0.154	1	39108-34-4	
9-Cl-PF3ON	ND	0.461	0.461	0.136	1	756426-58-1	
PFNS	ND	0.475	0.475	0.107	1	68259-12-1	
PFUnDA	ND	0.495	0.495	0.164	1	2058-94-8	
NMeFOSAA	ND	0.495	0.495	0.143	1	2355-31-9	
NEtFOSAA	ND	0.495	0.495	0.133	1	2991-50-6	
PFDS	ND	0.478	0.478	0.115	1	335-77-3	
PFDOA	ND	0.495	0.495	0.160	1	307-55-1	
MeFOSE	ND	0.495	0.495	0.107	1	24448-09-7	
10:2 FTS	ND	0.477	0.477	0.126	1	120226-60-0	
EtFOSE	ND	0.495	0.495	0.136	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.466	0.466	0.120	1	763051-92-9	
PFTrDA	ND	0.495	0.495	0.161	1	72629-94-8	
PFDoS	ND	0.479	0.479	0.125	1	79780-39-5	
PFTDA	ND	0.495	0.495	0.081	1	376-06-7	
PFHXDA	ND	0.495	0.495	0.124	1	67905-19-5	
PFODA	ND	0.495	0.495	0.162	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.90	10.1	102	50-200	
13C4_PFOA	9.90	10.8	109	50-200	
13C2_PFDA	9.90	10.7	108	50-200	
13C4_PFOS	9.47	10.2	108	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.90	10.6	107	50-200	
13C5_PFPeA	9.90	10.0	101	50-200	
13C3_PFBS	9.20	9.21	100	50-200	
13C2_4:2FTS	9.26	11.3	122	50-200	
13C5_PFHxA	9.90	10.2	103	50-200	
13C4_PFHpA	9.90	10.6	107	50-200	
13C3_PFHxS	9.37	9.41	100	50-200	
13C2_6:2FTS	9.40	11.8	126	50-200	
13C8_PFOA	9.90	9.99	101	50-200	
13C9_PFNA	9.90	10.4	105	50-200	
13C8_PFOS	9.47	9.43	100	50-200	
13C2_8:2FTS	9.48	10.2	107	50-200	
13C6_PFDA	9.90	10.3	104	50-200	
d3-MeFOSAA	9.90	12.4	125	50-200	
13C8_PFOSA	9.90	6.65	67	50-200	
d5-EtFOSAA	9.90	11.9	120	50-200	
13C7_PFUdA	9.90	11.0	111	50-200	
13C2_PFDoA	9.90	10.7	108	50-200	
13C2_PFTeDA	9.90	9.77	99	50-200	
13C3_HFPO-DA	9.90	9.70	98	50-200	
13C2_PFHxDA	9.90	8.85	89	50-200	
d7-N-MeFOSE	9.90	6.36	64	50-200	
d9-N-EtFOSE	9.90	6.41	65	50-200	
d3-N-MeFOSA	9.90	5.88	59	50-200	
d5-N-EtFOSA	9.90	6.18	62	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.94	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.22	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.04	5.03	
13C4_PFHpA	N/A	N/A	5.56	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.49	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.94	6.94	
d3-MeFOSAA	N/A	N/A	6.88	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.39	7.39	
13C2_PFDoA	N/A	N/A	7.83	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.26	10.23	
d5-N-EtFOSA	N/A	N/A	10.92	10.89	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.57	3.57	
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.630	0.450	5.26	5.25	
PFBS	0.340	0.320	5.22	5.22	
PFHxA	0.060	0.0610	5.04	5.04	
4:2 FTS	12.0	0.550	4.82	4.80	
PFPeS	0.390	0.300	5.81	5.80	
PFHpA	0.290	0.310	5.56	5.56	
DONA	0.720	0.480	5.73	5.73	
PFHxS	0.230	0.250	6.32	6.32	
PFOA	0.390	0.360	6.03	6.03	
6:2 FTS	0.540	0.580	5.79	5.79	
PFHpS	0.000	0.230	6.80	6.80	
PFNA	0.210	0.200	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.200	0.230	7.26	7.27	
MeFOSA	0.800	0.860	10.28	10.25	
PFDA	0.130	0.0980	6.94	6.95	
EtFOSAm	1.80	0.720	10.93	10.92	
8:2 FTS	0.000	0.670	6.68	6.69	
9-Cl-PF3ON	0.000	0.0220	7.59	7.59	
PFNS	0.000	0.250	7.95	7.71	
PFUnDA	0.120	0.0940	7.39	7.39	
NMeFOSAA	0.150	0.560	6.91	6.89	
NEtFOSAA	2.00	0.700	7.10	7.10	
PFDS	0.260	0.230	8.14	8.14	
PFDOA	0.095	0.150	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.630	0.00	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.180	0.0130	8.45	8.44	
PFTrDA	0.200	0.140	8.27	8.26	
PFDoS	0.000	0.230	8.93	8.93	
PFTDA	0.170	0.140	8.69	8.68	
PFHXDA	0.130	0.120	9.45	9.44	
PFODA	0.210	0.100	10.52	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.2	10.4	102	50-200	
13C4_PFOA	10.2	10.9	107	50-200	
13C2_PFDA	10.2	10.7	105	50-200	
13C4_PFOS	9.75	9.94	102	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.2	10.5	103	50-200	
13C5_PFPeA	10.2	10.6	104	50-200	
13C3_PFBS	9.47	9.75	103	50-200	
13C2_4:2FTS	9.53	9.10	95	50-200	
13C5_PFHxA	10.2	10.6	104	50-200	
13C4_PFHpA	10.2	10.6	104	50-200	
13C3_PFHxS	9.64	10.0	104	50-200	
13C2_6:2FTS	9.67	9.86	102	50-200	
13C8_PFOA	10.2	10.7	105	50-200	
13C9_PFNA	10.2	10.9	107	50-200	
13C8_PFOS	9.75	10.2	105	50-200	
13C2_8:2FTS	9.76	11.2	115	50-200	
13C6_PFDA	10.2	10.1	99	50-200	
d3-MeFOSAA	10.2	11.5	113	50-200	
13C8_PFOSA	10.2	10.6	104	50-200	
d5-EtFOSAA	10.2	11.2	110	50-200	
13C7_PFUdA	10.2	10.8	106	50-200	
13C2_PFDoA	10.2	10.8	106	50-200	
13C2_PFTeDA	10.2	9.70	95	50-200	
13C3_HFPO-DA	10.2	10.5	103	50-200	
13C2_PFHxDA	10.2	9.30	91	50-200	
d7-N-MeFOSE	10.2	10.2	100	50-200	
d9-N-EtFOSE	10.2	10.3	101	50-200	
d3-N-MeFOSA	10.2	9.83	96	50-200	
d5-N-EtFOSA	10.2	9.87	97	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers	CAS No.
PFBA	4.08	4.30	106	70-130		375-22-4
PFPeA	4.08	4.12	101	70-130		2706-90-3
HFPO-DA	4.08	4.12	101	70-130		13252-13-6
PFBS	3.61	3.82	106	70-130		375-73-5
PFHxA	4.08	4.07	100	70-130		307-24-4
4:2 FTS	3.81	3.99	105	70-130		757124-72-4
PFPeS	3.83	3.97	103	70-130		2706-91-4
PFHpA	4.08	4.19	103	70-130		375-85-9
DONA	3.85	3.81	99	70-130		919005-14-4
PFHxS	3.71	3.75	101	70-130		355-46-4
PFOA	4.08	3.95	97	70-130		335-67-1
6:2 FTS	3.87	3.90	101	70-130		27619-97-2
PFHpS	3.87	3.91	101	70-130		375-92-8
PFNA	4.08	3.89	95	70-130		375-95-1
PFOSAm	4.08	4.03	99	70-130		754-91-6
PFOS	3.77	3.89	103	70-130		1763-23-1
MeFOSA	4.08	4.13	101	70-130		31506-32-8
PFDA	4.08	4.33	106	70-130		335-76-2
EtFOSAm	4.08	4.21	103	70-130		4151-50-2
8:2 FTS	3.91	3.54	90	70-130		39108-34-4
9-Cl-PF3ON	3.80	3.70	97	70-130		756426-58-1
PFNS	3.91	3.72	95	70-130		68259-12-1
PFUnDA	4.08	4.21	103	70-130		2058-94-8
NMeFOSAA	4.08	4.02	99	70-130		2355-31-9
NEtFOSAA	4.08	4.24	104	70-130		2991-50-6
PFDS	3.93	3.69	94	70-130		335-77-3
PFDOA	4.08	4.07	100	70-130		307-55-1
MeFOSE	4.08	4.18	103	70-130		24448-09-7
10:2 FTS	3.93	3.57	91	70-130		120226-60-0
EtFOSE	4.08	4.05	99	70-130		1691-99-2
11-Cl-PF3OUdS	3.84	3.69	96	70-130		763051-92-9
PFTrDA	4.08	3.92	96	70-130		72629-94-8
PFDoS	3.95	3.67	93	70-130		79780-39-5
PFTDA	4.08	4.13	101	70-130		376-06-7
PFHXDA	4.08	4.06	100	70-130		67905-19-5
PFODA	4.08	3.37	83	70-130		16517-11-6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.93	
13C4_PFOS	N/A	N/A	7.28	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.60	3.60	
13C5_PFPeA	N/A	N/A	4.45	4.45	
13C3_PFBS	N/A	N/A	5.25	5.25	
13C2_4:2FTS	N/A	N/A	4.83	4.83	
13C5_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.34	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.03	6.03	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.28	7.29	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.87	6.87	
13C8_PFOSA	N/A	N/A	8.84	8.84	
d5-EtFOSAA	N/A	N/A	7.08	7.08	
13C7_PFUdA	N/A	N/A	7.38	7.38	
13C2_PFDoA	N/A	N/A	7.83	7.84	
13C2_PFTeDA	N/A	N/A	8.70	8.71	
13C3_HFPO-DA	N/A	N/A	5.26	5.26	
13C2_PFHxDA	N/A	N/A	9.49	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.71	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	0.47	0.45	5.27	5.28	
PFBS	0.31	0.33	5.26	5.26	
PFHxA	0.06	0.06	5.06	5.06	
4:2 FTS	0.56	0.56	4.83	4.83	
PFPeS	0.30	0.32	5.83	5.83	
PFHpA	0.28	0.28	5.57	5.57	
DONA	0.50	0.49	5.74	5.75	
PFHxS	0.27	0.26	6.34	6.35	
PFOA	0.36	0.35	6.04	6.04	
6:2 FTS	0.51	0.53	5.80	5.80	
PFHpS	0.24	0.23	6.82	6.83	
PFNA	0.19	0.19	6.49	6.49	
PFOSAm	N/A	N/A	8.84	8.84	
PFOS	0.22	0.23	7.29	7.29	
MeFOSA	0.87	0.87	10.37	10.37	
PFDA	0.08	0.08	6.94	6.94	
EtFOSAm	0.71	0.71	11.07	11.07	
8:2 FTS	0.67	0.70	6.68	6.69	
9-Cl-PF3ON	0.02	0.02	7.61	7.61	
PFNS	0.24	0.24	7.75	7.75	
PFUnDA	0.09	0.09	7.39	7.39	
NMeFOSAA	0.55	0.59	6.87	6.88	
NEtFOSAA	0.67	0.66	7.09	7.09	
PFDS	0.24	0.24	8.19	8.19	
PFDOA	0.13	0.14	7.84	7.84	
MeFOSE	N/A	N/A	10.13	10.13	
10:2 FTS	0.69	0.62	7.57	7.57	
EtFOSE	0.00	0.00	10.77	10.77	
11-Cl-PF3OUdS	0.01	0.01	8.49	8.49	
PFTrDA	0.15	0.15	8.28	8.28	
PFDoS	0.24	0.23	9.00	9.00	
PFTDA	0.14	0.14	8.71	8.71	
PFHXDA	0.12	0.12	9.49	9.49	
PFODA	0.10	0.10	10.64	10.64	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
13C2_PFHxA	10.2	10.4	102	11.0	107	4.6	50-200	
13C4_PFOA	10.2	10.9	107	11.4	111	4.1	50-200	
13C2_PFDA	10.2	10.7	105	11.1	108	3.3	50-200	
13C4_PFOS	9.80	9.94	102	10.3	105	3.4	50-200	

Extracted Internal Standards

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
13C4_PFBA	10.2	10.5	103	11.4	112	7.6	50-200	
13C5_PFPeA	10.2	10.6	104	11.3	110	5.8	50-200	
13C3_PFBS	9.51	9.75	103	10.1	106	2.9	50-200	
13C2_4:2FTS	9.58	9.10	95	10.4	108	12.7	50-200	
13C5_PFHxA	10.2	10.6	104	10.6	103	1.0	50-200	
13C4_PFHpA	10.2	10.6	104	11.3	110	5.5	50-200	
13C3_PFHxS	9.69	10.0	104	9.79	101	2.7	50-200	
13C2_6:2FTS	9.72	9.86	102	10.00	103	0.9	50-200	
13C8_PFOA	10.2	10.7	105	11.5	112	6.2	50-200	
13C9_PFNA	10.2	10.9	107	10.7	105	2.3	50-200	
13C8_PFOS	9.80	10.2	105	10.7	109	3.7	50-200	
13C2_8:2FTS	9.81	11.2	115	11.4	116	1.2	50-200	
13C6_PFDA	10.2	10.1	99	10.7	105	5.6	50-200	
d3-MeFOSAA	10.2	11.5	113	12.1	118	4.6	50-200	
13C8_PFOSA	10.2	10.6	104	10.8	105	1.1	50-200	
d5-EtFOSAA	10.2	11.2	110	12.0	117	5.9	50-200	
13C7_PFUdA	10.2	10.8	106	11.2	110	2.9	50-200	
13C2_PFDoA	10.2	10.8	106	10.9	107	0.9	50-200	
13C2_PFTeDA	10.2	9.70	95	10.2	99	4.2	50-200	
13C3_HFPO-DA	10.2	10.5	103	11.2	110	6.3	50-200	
13C2_PFHxDA	10.2	9.30	91	9.78	96	4.6	50-200	
d7-N-MeFOSE	10.2	10.2	100	10.9	106	6.3	50-200	
d9-N-EtFOSE	10.2	10.3	101	10.8	106	4.4	50-200	
d3-N-MeFOSA	10.2	9.83	96	10.2	100	3.2	50-200	
d5-N-EtFOSA	10.2	9.87	97	10.4	101	4.6	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
PFBA	4.10	4.30	106	4.19	102	3.3	70-130	
PFPeA	4.10	4.12	101	3.97	97	4.3	70-130	
HFPO-DA	4.10	4.12	101	4.00	98	3.5	70-130	
PFBS	3.63	3.82	106	3.66	101	4.7	70-130	
PFHxA	4.10	4.07	100	4.07	99	0.6	70-130	
4:2 FTS	3.83	3.99	105	3.54	92	12.4	70-130	
PFPeS	3.85	3.97	103	4.15	108	4.1	70-130	
PFHpA	4.10	4.19	103	3.80	93	10.2	70-130	
DONA	3.87	3.81	99	3.68	95	3.9	70-130	
PFHxS	3.73	3.75	101	3.99	107	5.8	70-130	
PFOA	4.10	3.95	97	3.89	95	1.9	70-130	
6:2 FTS	3.89	3.90	101	3.94	101	0.5	70-130	
PFHpS	3.89	3.91	101	3.84	99	2.2	70-130	
PFNA	4.10	3.89	95	3.94	96	0.9	70-130	
PFOSAm	4.10	4.03	99	4.20	103	3.7	70-130	
PFOS	3.79	3.89	103	3.64	96	7.2	70-130	
MeFOSA	4.10	4.13	101	4.16	101	0.1	70-130	
PFDA	4.10	4.33	106	4.03	98	7.6	70-130	
EtFOSAm	4.10	4.21	103	4.03	98	4.9	70-130	
8:2 FTS	3.93	3.54	90	3.55	90	0.2	70-130	
9-Cl-PF3ON	3.82	3.70	97	3.61	95	3.0	70-130	
PFNS	3.93	3.72	95	3.62	92	3.2	70-130	
PFUnDA	4.10	4.21	103	4.18	102	1.3	70-130	
NMeFOSAA	4.10	4.02	99	3.80	93	6.3	70-130	
NEtFOSAA	4.10	4.24	104	4.22	103	0.8	70-130	
PFDS	3.95	3.69	94	3.89	98	5.0	70-130	
PFDOA	4.10	4.07	100	4.19	102	2.4	70-130	
MeFOSE	4.10	4.18	103	4.00	98	4.9	70-130	
10:2 FTS	3.95	3.57	91	3.92	99	8.8	70-130	
EtFOSE	4.10	4.05	99	4.00	98	1.8	70-130	
11-Cl-PF3OUdS	3.86	3.69	96	3.72	96	0.3	70-130	
PFTrDA	4.10	3.92	96	4.00	98	1.4	70-130	
PFDoS	3.97	3.67	93	3.73	94	1.1	70-130	
PFTDA	4.10	4.13	101	4.03	98	3.1	70-130	
PFHXDA	4.10	4.06	100	3.99	98	2.2	70-130	
PFODA	4.10	3.37	83	3.21	78	5.4	70-130	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.93	
13C4_PFOS	N/A	N/A	7.28	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.60	3.60	
13C5_PFPeA	N/A	N/A	4.45	4.45	
13C3_PFBS	N/A	N/A	5.25	5.25	
13C2_4:2FTS	N/A	N/A	4.82	4.83	
13C5_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.33	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.03	6.03	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.28	7.29	
13C2_8:2FTS	N/A	N/A	6.67	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.86	6.87	
13C8_PFOSA	N/A	N/A	8.83	8.84	
d5-EtFOSAA	N/A	N/A	7.08	7.08	
13C7_PFUdA	N/A	N/A	7.38	7.38	
13C2_PFDoA	N/A	N/A	7.83	7.84	
13C2_PFTeDA	N/A	N/A	8.70	8.71	
13C3_HFPO-DA	N/A	N/A	5.26	5.26	
13C2_PFHxDA	N/A	N/A	9.48	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.71	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	0.48	0.45	5.27	5.28	
PFBS	0.32	0.33	5.25	5.26	
PFHxA	0.06	0.06	5.06	5.06	
4:2 FTS	0.57	0.56	4.83	4.83	
PFPeS	0.30	0.32	5.83	5.83	
PFHpA	0.31	0.28	5.57	5.57	
DONA	0.51	0.49	5.74	5.75	
PFHxS	0.26	0.26	6.34	6.35	
PFOA	0.37	0.35	6.03	6.04	
6:2 FTS	0.50	0.53	5.79	5.80	
PFHpS	0.23	0.23	6.82	6.83	
PFNA	0.20	0.19	6.49	6.49	
PFOSAm	N/A	N/A	8.84	8.84	
PFOS	0.23	0.23	7.29	7.29	
MeFOSA	0.86	0.87	10.36	10.37	
PFDA	0.09	0.08	6.93	6.94	
EtFOSAm	0.72	0.71	11.07	11.07	
8:2 FTS	0.68	0.70	6.67	6.69	
9-Cl-PF3ON	0.02	0.02	7.61	7.61	
PFNS	0.24	0.24	7.74	7.75	
PFUnDA	0.09	0.09	7.39	7.39	
NMeFOSAA	0.55	0.59	6.87	6.88	
NEtFOSAA	0.60	0.66	7.08	7.09	
PFDS	0.23	0.24	8.19	8.19	
PFDOA	0.13	0.14	7.83	7.84	
MeFOSE	N/A	N/A	10.12	10.13	
10:2 FTS	0.61	0.62	7.57	7.57	
EtFOSE	0.00	0.00	10.77	10.77	
11-Cl-PF3OUdS	0.01	0.01	8.49	8.49	
PFTrDA	0.15	0.15	8.28	8.28	
PFDoS	0.23	0.23	9.00	9.00	
PFTDA	0.14	0.14	8.70	8.71	
PFHXDA	0.12	0.12	9.49	9.49	
PFODA	0.11	0.10	10.64	10.64	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

MS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	10559601001-MS	Instrument ID	10LCMS03
Run File Name	A210517B_013	Column ID	112EB00094
Analyzed	05/17/2021 20:48	Ical ID	210512A03
Injected By	NH	Level	

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.77	10.3	105	50-200	
13C4_PFOA	9.77	10.7	109	50-200	
13C2_PFDA	9.77	11.7	120	50-200	
13C4_PFOS	9.35	10.3	111	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.77	7.62	78	50-200	
13C5_PFPeA	9.77	8.78	90	50-200	
13C3_PFBS	9.07	9.36	103	50-200	
13C2_4:2FTS	9.13	14.7	161	50-200	
13C5_PFHxA	9.77	10.0	103	50-200	
13C4_PFHpA	9.77	10.8	111	50-200	
13C3_PFHxS	9.24	8.70	94	50-200	
13C2_6:2FTS	9.27	13.8	149	50-200	
13C8_PFOA	9.77	10.2	105	50-200	
13C9_PFNA	9.77	10.7	110	50-200	
13C8_PFOS	9.35	9.34	100	50-200	
13C2_8:2FTS	9.36	12.1	130	50-200	
13C6_PFDA	9.77	11.7	120	50-200	
d3-MeFOSAA	9.77	13.2	136	50-200	
13C8_PFOSA	9.77	5.85	60	50-200	
d5-EtFOSAA	9.77	10.6	109	50-200	
13C7_PFUdA	9.77	12.8	131	50-200	
13C2_PFDoA	9.77	12.3	126	50-200	
13C2_PFTeDA	9.77	9.57	98	50-200	
13C3_HFPO-DA	9.77	9.29	95	50-200	
13C2_PFHxDA	9.77	7.93	81	50-200	
d7-N-MeFOSE	9.77	5.89	60	50-200	
d9-N-EtFOSE	9.77	5.87	60	50-200	
d3-N-MeFOSA	9.77	5.67	58	50-200	
d5-N-EtFOSA	9.77	5.73	59	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

MS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	10559601001-MS	Instrument ID	10LCMS03
Run File Name	A210517B_013	Column ID	112EB00094
Analyzed	05/17/2021 20:48	Ical ID	210512A03
Injected By	NH	Level	

Native Analytes

Compound	Sample Conc.	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers	CAS No.
PFBA	24.1	3.91	27.0	**59**	70-130	R	375-22-4
PFPeA	8.50	3.91	12.1	88	70-130		2706-90-3
HFPO-DA	0.000	3.91	3.79	96	70-130		13252-13-6
PFBS	6.82	3.46	9.49	73	70-130		375-73-5
PFHxA	12.3	3.91	15.1	**65**	70-130	R	307-24-4
4:2 FTS	0.000	3.65	3.96	108	70-130		757124-72-4
PFPeS	6.30	3.67	10.9	122	70-130		2706-91-4
PFHpA	3.90	3.91	7.63	93	70-130		375-85-9
DONA	0.000	3.69	3.49	95	70-130		919005-14-4
PFHxS	93.7	3.56	131	**1005**	70-130	RD	355-46-4
PFOA	19.3	3.91	21.6	**48**	70-130	R	335-67-1
6:2 FTS	1.33	3.71	4.12	74	70-130		27619-97-2
PFHpS	4.04	3.71	8.35	114	70-130		375-92-8
PFNA	0.000	3.91	3.90	98	70-130		375-95-1
PFOSAm	0.000	3.91	3.86	98	70-130		754-91-6
PFOS	104	3.61	102	**0**	70-130	RD	1763-23-1
MeFOSA	0.000	3.91	3.75	95	70-130		31506-32-8
PFDA	0.000	3.91	3.53	90	70-130		335-76-2
EtFOSAm	0.000	3.91	3.71	95	70-130		4151-50-2
8:2 FTS	0.000	3.75	3.88	103	70-130		39108-34-4
9-Cl-PF3ON	0.000	3.64	3.65	100	70-130		756426-58-1
PFNS	0.000	3.75	3.70	99	70-130		68259-12-1
PFUnDA	0.000	3.91	3.57	91	70-130		2058-94-8
NMeFOSAA	0.000	3.91	3.79	97	70-130		2355-31-9
NEtFOSAA	0.000	3.91	4.03	103	70-130		2991-50-6
PFDS	0.000	3.77	3.67	97	70-130		335-77-3
PFDOA	0.000	3.91	3.90	100	70-130		307-55-1
MeFOSE	0.000	3.91	3.85	97	70-130		24448-09-7
10:2 FTS	0.000	3.77	3.77	100	70-130		120226-60-0
EtFOSE	0.000	3.91	3.77	96	70-130		1691-99-2
11-Cl-PF3OUdS	0.000	3.68	3.29	90	70-130		763051-92-9
PFTrDA	0.000	3.91	3.02	77	70-130		72629-94-8
PFDoS	0.000	3.78	3.12	83	70-130		79780-39-5
PFTDA	0.000	3.91	3.73	95	70-130		376-06-7
PFHXDA	0.000	3.91	3.83	96	70-130		67905-19-5
PFODA	0.000	3.91	3.65	93	70-130		16517-11-6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

MS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	10559601001-MS	Instrument ID	10LCMS03
Run File Name	A210517B_013	Column ID	112EB00094
Analyzed	05/17/2021 20:48	Ical ID	210512A03
Injected By	NH	Level	

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.21	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFHpA	N/A	N/A	5.56	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.87	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.08	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.82	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.26	10.23	
d5-N-EtFOSA	N/A	N/A	10.92	10.89	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

MS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	10559601001-MS	Instrument ID	10LCMS03
Run File Name	A210517B_013	Column ID	112EB00094
Analyzed	05/17/2021 20:48	Ical ID	210512A03
Injected By	NH	Level	

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.56	3.57	R
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.46	0.45	5.26	5.25	
PFBS	0.33	0.32	5.22	5.22	
PFHxA	0.07	0.06	5.04	5.04	R
4:2 FTS	0.59	0.55	4.81	4.80	
PFPeS	0.30	0.30	5.80	5.80	
PFHpA	0.30	0.31	5.56	5.56	
DONA	0.52	0.48	5.74	5.73	
PFHxS	0.26	0.27	6.34	6.35	RD
PFOA	0.41	0.36	6.03	6.03	R
6:2 FTS	0.51	0.58	5.79	5.79	
PFHpS	0.23	0.23	6.80	6.80	
PFNA	0.20	0.20	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.17	0.22	7.19	7.29	RD
MeFOSA	0.86	0.86	10.28	10.25	
PFDA	0.09	0.09	6.94	6.95	
EtFOSAm	0.71	0.72	10.95	10.92	
8:2 FTS	0.68	0.67	6.68	6.69	
9-Cl-PF3ON	0.02	0.02	7.58	7.59	
PFNS	0.23	0.25	7.70	7.71	
PFUnDA	0.11	0.09	7.38	7.39	
NMeFOSAA	0.56	0.56	6.88	6.89	
NEtFOSAA	0.67	0.70	7.09	7.10	
PFDS	0.23	0.23	8.14	8.14	
PFDOA	0.14	0.15	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.63	0.63	7.57	7.58	
EtFOSE	0.00	0.00	10.67	10.64	
11-Cl-PF3OUdS	0.01	0.01	8.45	8.44	
PFTrDA	0.15	0.14	8.27	8.26	
PFDoS	0.23	0.23	8.93	8.93	
PFTDA	0.15	0.14	8.68	8.68	
PFHXDA	0.12	0.12	9.44	9.44	
PFODA	0.10	0.10	10.52	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR TCDD

Report Information:

Pace Project #: 10559602
Sample Receipt Date: 05/10/2021
Client Project #: 200402 SW#27 Vadnais
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Krista Carlson, your Pace Project Manager.

This report has been reviewed by:

May 24, 2021
Krista Carlson, Project Manager

(612) 607-1700 (fax)
krista.carlson@pacelabs.com

Report Prepared Date:
May 24, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of BayWest, LLC. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290A. The estimated detection limits (EDLs) were based on signal-to-noise measurements.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 65-81%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290A. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 105-114% with a relative percent difference of 8.2%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Report No.....10559602

Appendix A

Sample Management

Report No....10559602_8290TCDD_DFR

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10559602

10559602

01

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information:	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-607-6347
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

COC ID:	
Work Order Number	3000027125
Facility Code:	SW-27
Project Task Code:	PRJ07913
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives: HCl; none; none; none; H_2SO_4

Requested Analysis: DRO with silica gel cleanup (WI DRO); 2,3,7,8 TCD (Dioxin) - (EPA 8290A); 1,4-Dioxane (Analyzed as a single compound) - (8270 SIM); PFAS; Nitrate + Nitrite, as Nitrogen

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	WG	NW	Wtr-Ground	5-10-21	1130	9	X	X	X	X	X	
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	5-10-21	1350	9	X	X	X	X	X	
3	~~847406~~	~~SW27-MW03~~	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	Omit - 5-10-21
4	~~847411~~	~~SW27-MW04~~	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
5	~~854777~~	~~SW27-MW05~~	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
6	~~854580~~	~~SW27-MW06~~	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
7	~~854578~~	~~SW27-MW07~~	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
8	~~854579~~	~~SW27-MW08~~	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	5-10-21	1420	9	X	X	X	X	X	
10	Equipment Blank	~~SW27-EB01~~	QC-EB	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted T/ Bay West	5-10-21		Roger S / Pace	5-10-21	1600

SAMPLE CONDITIONS

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
3.3/4.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Traeger

SIGNATURE of SAMPLER: Ted Traeger

DATE Signed (MM/DD/YY): 5-10-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: WO#: 10559602

PM: KAC Due Date: 05/24/21

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☒Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☒Bubble Wrap ☒Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☒T3(0459) ☐OS418-LS ☐T4(0254) ☐T5(0489) ☐160285052 **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☐No **Were All Container Temps Taken?** ☐Yes ☐No ☐N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 3.3, 4.1 °C

Correction Factor: TNR **Cooler Temp Corrected w/temp blank:** 3.3, 4.1 °C

Average Corrected Temp (no temp blank only): _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

USDA Regulated Soil: (☒N/A, water sample/Other:_____)

Date/Initials of Person Examining Contents: CS 5/11/21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		8.
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒Water ☐Soil ☐Oil ☐Other_____	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☒N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐Yes	☐No	☒N/A	☐NaOH ☐HNO_3 ☐H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted:_____ Date/Time:_____

Comments/Resolution:_____

Project Manager Review: KCC **Date:** 05/12/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Report No.....10559602_8290TCDD_DFR

Labeled by: TJO

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW01		
Lab Sample ID	10559602001		
Filename	F210520B_13		
Injected By	SMT		
Total Amount Extracted	999 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/10/2021 11:30
ICAL ID	F210425	Received	05/10/2021 16:00
CCal Filename(s)	F210520A_20 & F210520B_16	Extracted	05/14/2021 12:30
Method Blank ID	BLANK-90041	Analyzed	05/21/2021 06:11

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	3.62	2,3,7,8-TCDD-13C	2.00	65
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	81

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW02		
Lab Sample ID	10559602002		
Filename	F210520B_14		
Injected By	SMT		
Total Amount Extracted	982 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/10/2021 13:50
ICAL ID	F210425	Received	05/10/2021 16:00
CCal Filename(s)	F210520A_20 & F210520B_16	Extracted	05/14/2021 12:30
Method Blank ID	BLANK-90041	Analyzed	05/21/2021 06:58

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	2.60	2,3,7,8-TCDD-13C	2.00	77
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	91

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW02-D		
Lab Sample ID	10559602003		
Filename	F210520B_15		
Injected By	SMT		
Total Amount Extracted	976 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/10/2021 14:20
ICAL ID	F210425	Received	05/10/2021 16:00
CCal Filename(s)	F210520A_20 & F210520B_16	Extracted	05/14/2021 12:30
Method Blank ID	BLANK-90041	Analyzed	05/21/2021 07:45

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	3.58	2,3,7,8-TCDD-13C	2.00	81
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	87

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Lab Sample Name	DFBLKBT		
Lab Sample ID	BLANK-90041	Matrix	Water
Filename	F210518A_09	Dilution	NA
Total Amount Extracted	963 mL	Extracted	05/14/2021 12:30
ICAL ID	F210425	Analyzed	05/18/2021 15:22
CCal Filename(s)	F210518A_02 & F210518A_18	Injected By	SMT

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	1.65	2,3,7,8-TCDD-13C	2.00	45
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	83

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCS-90042		
Filename	F210518A_16	Matrix	Water
Total Amount Extracted	998 mL	Dilution	NA
ICAL ID	F210425	Extracted	05/14/2021 12:30
CCal Filename(s)	F210518A_02 & F210518A_18	Analyzed	05/18/2021 20:52
Method Blank ID	BLANK-90041	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.21	105	2,3,7,8-TCDD-13C	2.0	57
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	82

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCSD-90043		
Filename	F210518A_17	Matrix	Water
Total Amount Extracted	1020 mL	Dilution	NA
ICAL ID	F210425	Extracted	05/14/2021 12:30
CCal Filename(s)	F210518A_02 & F210518A_18	Analyzed	05/18/2021 21:39
Method Blank ID	BLANK-90041	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.23	114	2,3,7,8-TCDD-13C	2.0	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	98

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A

Spike Recovery Relative Percent Difference (RPD) Results

Client	Bay West, LLC		
Spike 1 ID	LCS-90042	Spike 2 ID	LCSD-90043
Spike 1 Filename	F210518A_16	Spike 2 Filename	F210518A_17

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	105	114	8.2

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

June 08, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on May 10, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sylvia Hunter

Sylvia Hunter
sylvia.hunter@pacelabs.com
1(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10559608001	**SW27-MW01**	Water	05/10/21 11:30	05/10/21 16:00
10559608002	**SW27-MW02**	Water	05/10/21 13:50	05/10/21 16:00
10559608003	**SW27-MW02-D**	Water	05/10/21 14:20	05/10/21 16:00

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10559608001	**SW27-MW01**	EPA 900.0	ERT	1	PASI-PA
10559608002	**SW27-MW02**	EPA 900.0	ERT	1	PASI-PA
10559608003	**SW27-MW02-D**	EPA 900.0	ERT	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Method: **EPA 900.0**
Description: 900.0 Gross Alpha/Beta
Client: Bay West LLC
Date: June 08, 2021

General Information:
3 samples were analyzed for EPA 900.0 by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Sample: SW27-MW01 **Lab ID: 10559608001** Collected: 05/10/21 11:30 Received: 05/10/21 16:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**1.94 ± 1.70 (2.97) C:NA T:NA**	pCi/L	06/06/21 23:33	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Sample: SW27-MW02 **Lab ID: 10559608002** Collected: 05/10/21 13:50 Received: 05/10/21 16:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**4.70 ± 1.63 (1.80) C:NA T:NA**	pCi/L	06/07/21 17:31	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Sample: SW27-MW02-D **Lab ID: 10559608003** Collected: 05/10/21 14:20 Received: 05/10/21 16:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**4.60 ± 1.57 (1.64) C:NA T:NA**	pCi/L	06/07/21 17:32	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

QC Batch: 450304
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 10559608001, 10559608002, 10559608003

METHOD BLANK: 2173274 Matrix: Water
Associated Lab Samples: 10559608001, 10559608002, 10559608003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.375 ± 0.461 (1.75) C:NA T:NA	pCi/L	06/06/21 23:36	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559608

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10559608001	**SW27-MW01**	EPA 900.0	450304		
10559608002	**SW27-MW02**	EPA 900.0	450304		
10559608003	**SW27-MW02-D**	EPA 900.0	450304		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10559608

10559608

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information			
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Numbe	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter	Facility Code:	SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-607-6347	Project Task Code:	PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com						

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: ~0°C	Requested Analysis: Gross Alpha	Comments
1	847409	SW27-MW01	Sample	G	WG	NW	Wtr-Ground	5-10-21	1130	1		X	001
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground	5-10-21	1350	1		X	002
3	~~847406~~	~~SW27-MW03~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~					~~X~~	omit - TT 5-12-21
4	~~847411~~	~~SW27-MW04~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~					~~X~~	11
5	~~854777~~	~~SW27-MW05~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~					~~X~~	11
6	~~854580~~	~~SW27-MW06~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~					~~X~~	11
7	~~854578~~	~~SW27-MW07~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~					~~X~~	11
8	~~854579~~	~~SW27-MW08~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~					~~X~~	11
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground	5-10-21	1420	1		X	003
10	Equipment Blank	~~SW27-EB01~~	~~QC-EB~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~					~~X~~	11
11													
12													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
NON-ADMIN	Ted T / Bay West	5-10-21		Ragnar S / Pace	5-10-21	1600	3.7/4.1	Y	Y	N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Toege

SIGNATURE of SAMPLER: Ted Toege

DATE Signed (MM/DD/YY): 5-10-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #: **WO#: 10559608**

PM: SH1 Due Date: 06/01/21
CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☒Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒Yes ☐No **Seals Intact?** ☒Yes ☐No **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Packing Material: ☐Bubble Wrap ☐Bubble Bags ☒None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☒T3(0459) ☐OS418-LS ☐T4(0254) ☐T5(0489) ☐160285052 **Type of Ice:** ☒Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☒No **Were All Container Temps Taken?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 3.3, 4.1 °C

Correction Factor: TNC **Cooler Temp Corrected w/temp blank:** 3.3, 4.1 °C

Average Corrected Temp (no temp blank only): _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

USDA Regulated Soil: (☒ N/A, water sample/Other:_____)

Date/Initials of Person Examining Contents: MH2 5.11 21

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒Yes	☐No		1.
Chain of Custody Relinquished?	☒Yes	☐No		2.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☒Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☒No		6.
Sufficient Volume?	☒Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		8.
Containers Intact?	☒Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒Water ☐Soil ☐Oil ☐Other_____	☒Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☒Yes	☐No	☐N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☒Yes	☐No	☐N/A	☐ NaOH ☒ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate 1-3
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☒N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine | 0-6 Roll 22/419 | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☒N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☒N/A	
Trip Blank Present?	☐Yes	☐No	☒N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	Pace Trip Blank Lot # (if purchased):_____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Sylvia Hunter **Date:** 5/12/21

Over there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of preservative, out of temp, incorrect containers).

Labeled by: TJ (1)

Internal Transfer Chain of Custody

WO# : 30421256

30421256

☐ Samples Pre-Logged into eCOC.

State Of Origin: MN-ADMI

Cert. Needed: ☒ Yes

Workorder: 10559608 **Workorder Name:** 200402 SW#27 Vadnais Heights **Owner Received Date:** 5/10/2021 **Results Requested By:** 6/1/2021

Report To	Subcontract To
Sylvia Hunter Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone 1(612)607-1700	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600

BP1N

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Gross Alpha	LAB USE ONLY
1	SW27-MW01	PS	5/10/2021 11:30	10559608001	Water	1	X	001
2	SW27-MW02	PS	5/10/2021 13:50	10559608002	Water	1	X	002
3	SW27-MW02-D	PS	5/10/2021 14:20	10559608003	Water	1	X	003
4								
5								

Requested Analysis

Comments

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature]	5/13/21 1145	[signature]	5-14-21 1015
2				
3				

Cooler Temperature on Receipt N/A °C | **Custody Seal** (Y) or N | **Received on Ice** Y or (N) | **Samples Intact** (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.*

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

#_30421256

Pace Analytical

Client Name: Pace MN Project #

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Label

Tracking #: 9371 9292 9617

LIMS Login

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used — Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

pH paper Lot# 100110

Date and Initials of person examining contents: 5-18-21

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed: Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: Date: 5-18-21 Survey Meter SN: 15-03

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

June 08, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on May 11, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sylvia Hunter

Sylvia Hunter
sylvia.hunter@pacelabs.com
1(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10559708001	**SW27-MW03**	Water	05/11/21 10:00	05/11/21 16:40
10559708002	**SW27-MW04**	Water	05/11/21 12:30	05/11/21 16:40
10559708003	**SW27-MW05**	Water	05/11/21 15:10	05/11/21 16:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10559708001	**SW27-MW03**	EPA 900.0	ERT	1	PASI-PA
10559708002	**SW27-MW04**	EPA 900.0	ERT	1	PASI-PA
10559708003	**SW27-MW05**	EPA 900.0	ERT	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Method: **EPA 900.0**
Description: 900.0 Gross Alpha/Beta
Client: Bay West LLC
Date: June 08, 2021

General Information:
3 samples were analyzed for EPA 900.0 by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Sample: SW27-MW03 **Lab ID: 10559708001** Collected: 05/11/21 10:00 Received: 05/11/21 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**-0.693 ± 4.38 (9.09) C:NA T:NA**	pCi/L	06/07/21 17:31	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Sample: SW27-MW04 **Lab ID: 10559708002** Collected: 05/11/21 12:30 Received: 05/11/21 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**13.2 ± 5.97 (8.37) C:NA T:NA**	pCi/L	06/07/21 17:31	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Sample: SW27-MW05 **Lab ID: 10559708003** Collected: 05/11/21 15:10 Received: 05/11/21 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**3.39 ± 1.96 (2.91) C:NA T:NA**	pCi/L	06/06/21 23:34	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

QC Batch: 450304
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 10559708001, 10559708002, 10559708003

METHOD BLANK: 2173274 Matrix: Water
Associated Lab Samples: 10559708001, 10559708002, 10559708003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.375 ± 0.461 (1.75) C:NA T:NA	pCi/L	06/06/21 23:36	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559708

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10559708001	**SW27-MW03**	EPA 900.0	450304		
10559708002	**SW27-MW04**	EPA 900.0	450304		
10559708003	**SW27-MW05**	EPA 900.0	450304		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A (Required Client Information)		Section B (Required Project Information)		Section C (Invoice Information)		Section D (Laboratory Information)		Section E (MPCA Information)	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Numbe	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter	Facility Code:	SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com						

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: HNO3	Requested Analysis: Gross Alpha	Comments
1	~~847409~~	~~SW27-MW01~~	Sample	G	WG	NW	Wtr-Ground					X	Omit - TT
2	~~847410~~	SW27-MW02	Sample	G	WG	NW	~~Wtr-Ground~~					X	"
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	5-11-21	1000	1		X	1
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	5-11-21	1230	1		X	2
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	5-11-21	1510	1		X	3
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	5-11-21	1510			X	Omit - TT
7	~~854578~~	~~SW27-MW07~~	Sample	G	WG	NW	Wtr-Ground					X	"
8	~~854579~~	~~SW27-MW08~~	Sample	G	WG	NW	Wtr-Ground					X	"
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground					X	"
10	Equipment Blank	~~SW27-EB01~~	QC-EB	G	WG	NW	Wtr-Ground					X	"
11													
12													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
NON-ADMIN	Ted T / Bay West	5-11-21	1625	Will Cuffney - Pace	05-12-21	1640	5.9,4.7	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Traeger

SIGNATURE of SAMPLER: Ted Traeger

DATE Signed (MM/DD/YY): 5-11-21

WO# : 10559708

Page 12 of 15

10559708

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO# : 10559708

PM: SH1 Due Date: 06/02/21

CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☒ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☐ OS418-LS ☐ T4(0254) ☒ T5(0489) ☐ 160285052 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☐ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☐ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 5.9, 4.3 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

Correction Factor: True **Cooler Temp Corrected w/temp blank:** 5.9, 4.3 °C

USDA Regulated Soil: (☒ N/A, water sample/Other: _____)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Date/Initials of Person Examining Contents: HB 5/12/21
Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒ Yes	☐ No		1.
Chain of Custody Relinquished?	☒ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☒ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☒ No		6.
Sufficient Volume?	☒ Yes	☐ No		7.
Correct Containers Used?	☒ Yes	☐ No		8.
-Pace Containers Used?	☒ Yes	☐ No		
Containers Intact?	☒ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☒ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
Matrix: ☒ Water ☐ Soil ☐ Oil ☐ Other _____				
All containers needing acid/base preservation have been checked?	☒ Yes	☐ No	☐ N/A	12. Sample # 001 - 003 LA 05-12-21
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☒ Yes	☐ No	☐ N/A	☐ NaOH ☒ HNO_3 1/1 ~~☒ H_2SO_4 1/1~~ ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒ Yes	☐ No	☐ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip 221419 | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☒ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☒ N/A	
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ **Field Data Required?** ☐ Yes ☐ No

Comments/Resolution: _____

Project Manager Review: Jessica Hunter **Date:** 5/13/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: CA HB

Internal Transfer Chain of Custody

WO# : 30421255

30421255

☐ Samples Pre-Logged into eCOC.

State Of Origin: MN-ADMII

Cert. Needed: ☐ Yes

Workorder: 10559708 **Workorder Name:** 200402 SW#27 Vadnais Heights **Owner Received Date:** 5/11/2021 **Results Requested By:** 6/2/2021

Report To	Subcontract To
Sylvia Hunter Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone 1(612)607-1700	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600

BP2N

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers HNO3						Requested Analysis Gross Alpha											LAB USE ONLY
1	SW27-MW03	PS	5/11/2021 10:00	10559708001	Water	1						X											001
2	SW27-MW04	PS	5/11/2021 12:30	10559708002	Water	1						X											002
3	SW27-MW05	PS	5/11/2021 15:10	10559708003	Water	1						X											003
4																							
5																							

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	[signature]	5/13/21 15:08	[signature]	5-14-21	1015
2					
3					

Cooler Temperature on Receipt n/a °C | **Custody Seal** (Y) or N | **Received on Ice** Y or (N) | **Samples Intact** (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace MN Project # #_30421255

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label

Tracking #: 9871 9292 9617 LIMS Login

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used — Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

pH paper Lot# 100110 Date and Initials of person examining contents: 5-18-21

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed: Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: Date: 5-18-21 Survey Meter SN: 15063

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

May 26, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on May 11, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sylvia Hunter

Sylvia Hunter
sylvia.hunter@pacelabs.com
1(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10559712001	**SW27-MW03**	Water	05/11/21 10:00	05/11/21 16:40
10559712002	**SW27-MW04**	Water	05/11/21 12:30	05/11/21 16:40
10559712003	**SW27-MW05**	Water	05/11/21 15:10	05/11/21 16:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10559712001	**SW27-MW03**	WI MOD DRO	JVM	2
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1
10559712002	**SW27-MW04**	WI MOD DRO	JVM	2
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1
10559712003	**SW27-MW05**	WI MOD DRO	JVM	2
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1

PASI-M = Pace Analytical Services - Minneapolis

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Method: **WI MOD DRO**
Description: WIDRO LV GCS Silica Gel
Client: Bay West LLC
Date: May 26, 2021

General Information:
3 samples were analyzed for WI MOD DRO by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Method: **EPA 8270E by SIM**
Description: 8270E MSSV 14 Dioxane By SIM
Client: Bay West LLC
Date: May 26, 2021

General Information:
3 samples were analyzed for EPA 8270E by SIM by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA Mod. 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 741717

S0: Surrogate recovery outside laboratory control limits.

- BLANK (Lab ID: 3955309)
  - 1,4-Dioxane-d8 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 741717

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Method: **EPA 353.2**
Description: 353.2 Nitrate + Nitrite
Client: Bay West LLC
Date: May 26, 2021

General Information:
3 samples were analyzed for EPA 353.2 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Sample: SW27-MW03 **Lab ID: 10559712001** Collected: 05/11/21 10:00 Received: 05/11/21 16:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**0.044J**	mg/L	0.098	0.028	1	05/13/21 08:24	05/14/21 11:10		
Surrogates									
n-Triacontane (S)	64	%.	34-125		1	05/13/21 08:24	05/14/21 11:10		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 11:27	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	39	%.	30-125		1	05/13/21 09:16	05/14/21 11:27		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.026J**	mg/L	0.10	0.018	1		05/13/21 17:09		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Sample: SW27-MW04 **Lab ID: 10559712002** Collected: 05/11/21 12:30 Received: 05/11/21 16:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.098**	mg/L	0.098	0.028	1	05/13/21 08:24	05/14/21 11:17		
Surrogates									
n-Triacontane (S)	84	%.	34-125		1	05/13/21 08:24	05/14/21 11:17		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 11:44	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	43	%.	30-125		1	05/13/21 09:16	05/14/21 11:44		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.11**	mg/L	0.10	0.018	1		05/13/21 17:10		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Sample: SW27-MW05 **Lab ID: 10559712003** Collected: 05/11/21 15:10 Received: 05/11/21 16:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.098**	mg/L	0.098	0.028	1	05/13/21 08:24	05/14/21 11:24		
Surrogates									
n-Triacontane (S)	82	%.	34-125		1	05/13/21 08:24	05/14/21 11:24		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 12:02	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	45	%.	30-125		1	05/13/21 09:16	05/14/21 12:02		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**1.5**	mg/L	0.10	0.018	1		05/13/21 17:11		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

QC Batch: 741717
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E Water 14 Dioxane by SIM
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559712001, 10559712002, 10559712003

METHOD BLANK: 3955309 Matrix: Water
Associated Lab Samples: 10559712001, 10559712002, 10559712003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (SIM)	ug/L	<0.25	0.25	0.11	05/14/21 08:49	
1,4-Dioxane-d8 (S)	%.	29	30-125		05/14/21 08:49	S0

LABORATORY CONTROL SAMPLE & LCSD: 3955310 3955311

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (SIM)	ug/L	10	9.2	9.5	92	95	59-134	4	20	
1,4-Dioxane-d8 (S)	%.				41	40	30-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

QC Batch: 741714
QC Batch Method: WI MOD DRO
Analysis Method: WI MOD DRO
Analysis Description: WIDRO Low Volume GCS w/Cleanup
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559712001, 10559712002, 10559712003

METHOD BLANK: 3955306 Matrix: Water
Associated Lab Samples: 10559712001, 10559712002, 10559712003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	<0.10	0.10	0.029	05/14/21 10:07	
n-Triacontane (S)	%.	87	34-125		05/14/21 10:07	

LABORATORY CONTROL SAMPLE & LCSD: 3955307 3955308

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	0.8	0.63	0.57	79	72	42-125	9	20	
n-Triacontane (S)	%.				85	77	34-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

QC Batch: 741957
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559712001, 10559712002, 10559712003

METHOD BLANK: 3956658 Matrix: Water
Associated Lab Samples: 10559712001, 10559712002, 10559712003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.10	0.10	0.018	05/13/21 17:13	

LABORATORY CONTROL SAMPLE: 3956659

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.93	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3956660 3956661

Parameter	Units	10559916001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.057J	1	1	1.1	1.1	102	105	90-110	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 742050

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

S0 Surrogate recovery outside laboratory control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559712

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10559712001	**SW27-MW03**	WI MOD DRO	741714	WI MOD DRO	742153
10559712002	**SW27-MW04**	WI MOD DRO	741714	WI MOD DRO	742153
10559712003	**SW27-MW05**	WI MOD DRO	741714	WI MOD DRO	742153
10559712001	**SW27-MW03**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559712002	**SW27-MW04**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559712003	**SW27-MW05**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559712001	**SW27-MW03**	EPA 353.2	741957		
10559712002	**SW27-MW04**	EPA 353.2	741957		
10559712003	**SW27-MW05**	EPA 353.2	741957		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information		Section E — MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Numbe	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter	Facility Code:	SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com						

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives: HCl (cool) | none | none | none | H2SO4

Requested Analysis: ORO with silica gel cleanup (WI DRO) | 2,3,7,8 TCD (Dioxin) - (EPA 8290A) | 1,4-Dioxane (Analyzed as a single compound) - (8270 SIM) | PFAS | Nitrate + Nitrite, as Nitrogen

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	ORO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	omit - TT
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	5-11-21	1000	9	X	X	X	X	X	1
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	5-11-21	1230	9	X	X	X	X	X	2
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	5-11-21	1510	9	X	X	X	X	X	3
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	omit - TT
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Ted T / Bay West	5-11-21	1642	Pace	05-11-21	1640	5.9 °C / Y / N / Y

Temp (°C) | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Troge

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 5-11-21

WO#: 10559712

10559712

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10559712
PM: SH1 **Due Date: 05/25/21**
CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☐ OS418-LS ☐ T4(0254) ☑ T5(0489) ☐ 160285052 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 5.9, 4.3 °C

Correction Factor: True **Cooler Temp Corrected w/temp blank:** 5.9, 4.3 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☑ N/A, water sample/Other: _____)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Date/Initials of Person Examining Contents: Ca 05.12.21
Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Volume?	☑ Yes	☐ No		7.
Correct Containers Used?	☑ Yes	☐ No		8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
Matrix: ☐ Water ☐ Soil ☐ Oil ☐ Other _____				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO_3 ☐ H_2SO_4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑ Yes	☐ No	☐ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
SH 5/13/21				Res. Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ **Field Data Required?** ☐ Yes ☐ No

Comments/Resolution: _____

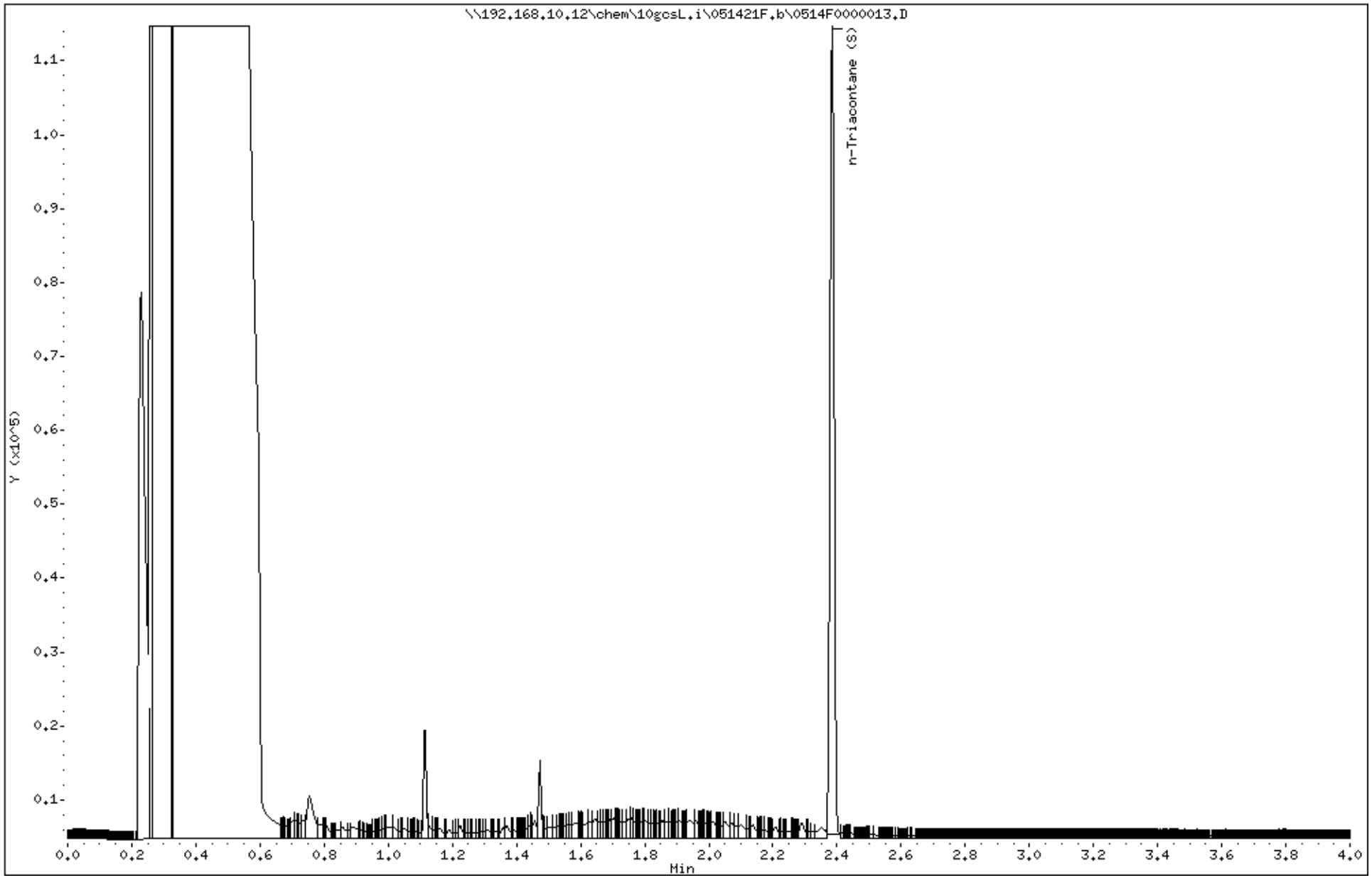
Project Manager Review: Alyssa Hunter **Date:** 5/13/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: CA HB 03

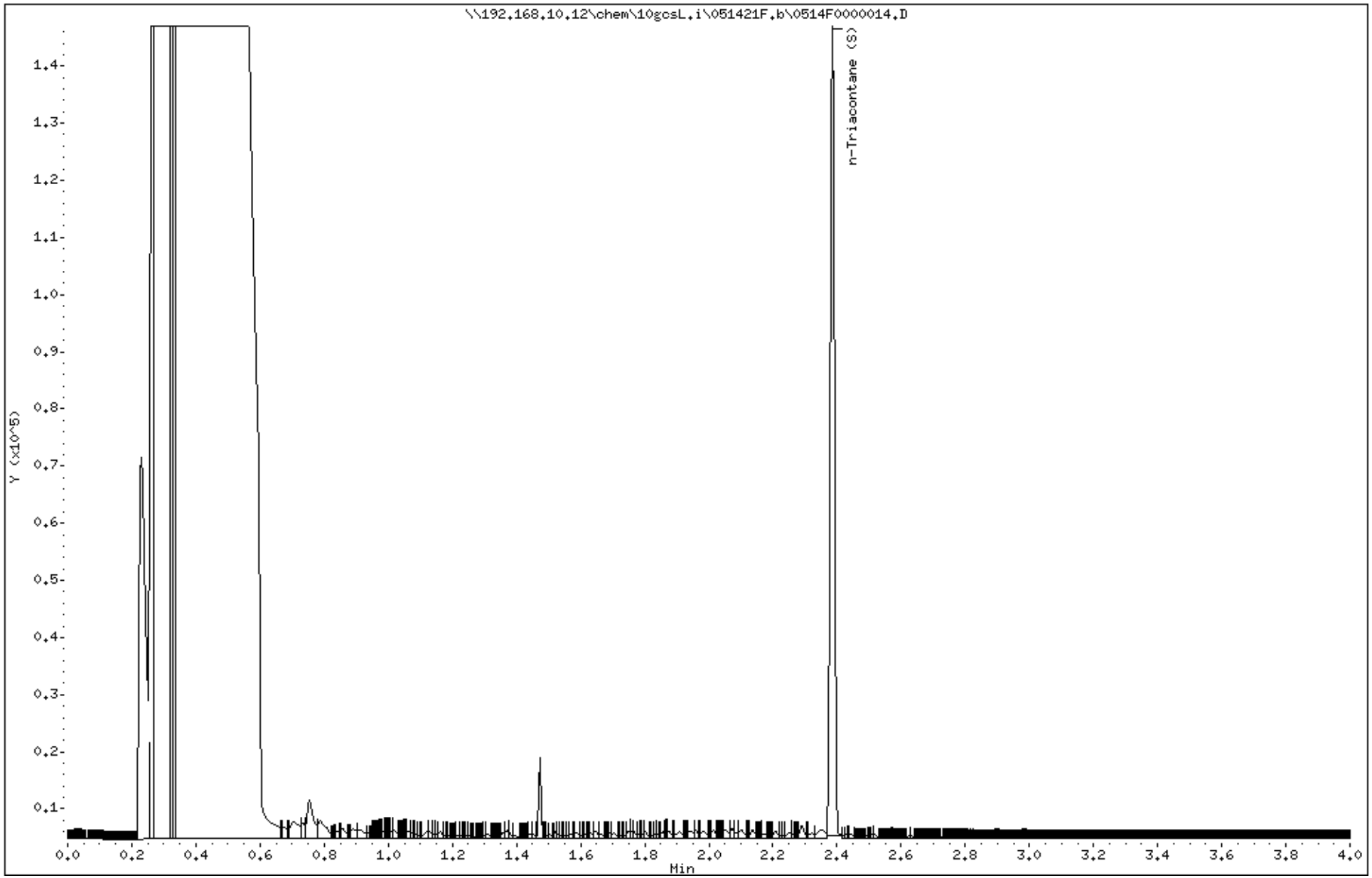
Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000013.D
Date : 14-MAY-2021 11:10
Client ID: SW27-MW03
Sample Info: 10559712001
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



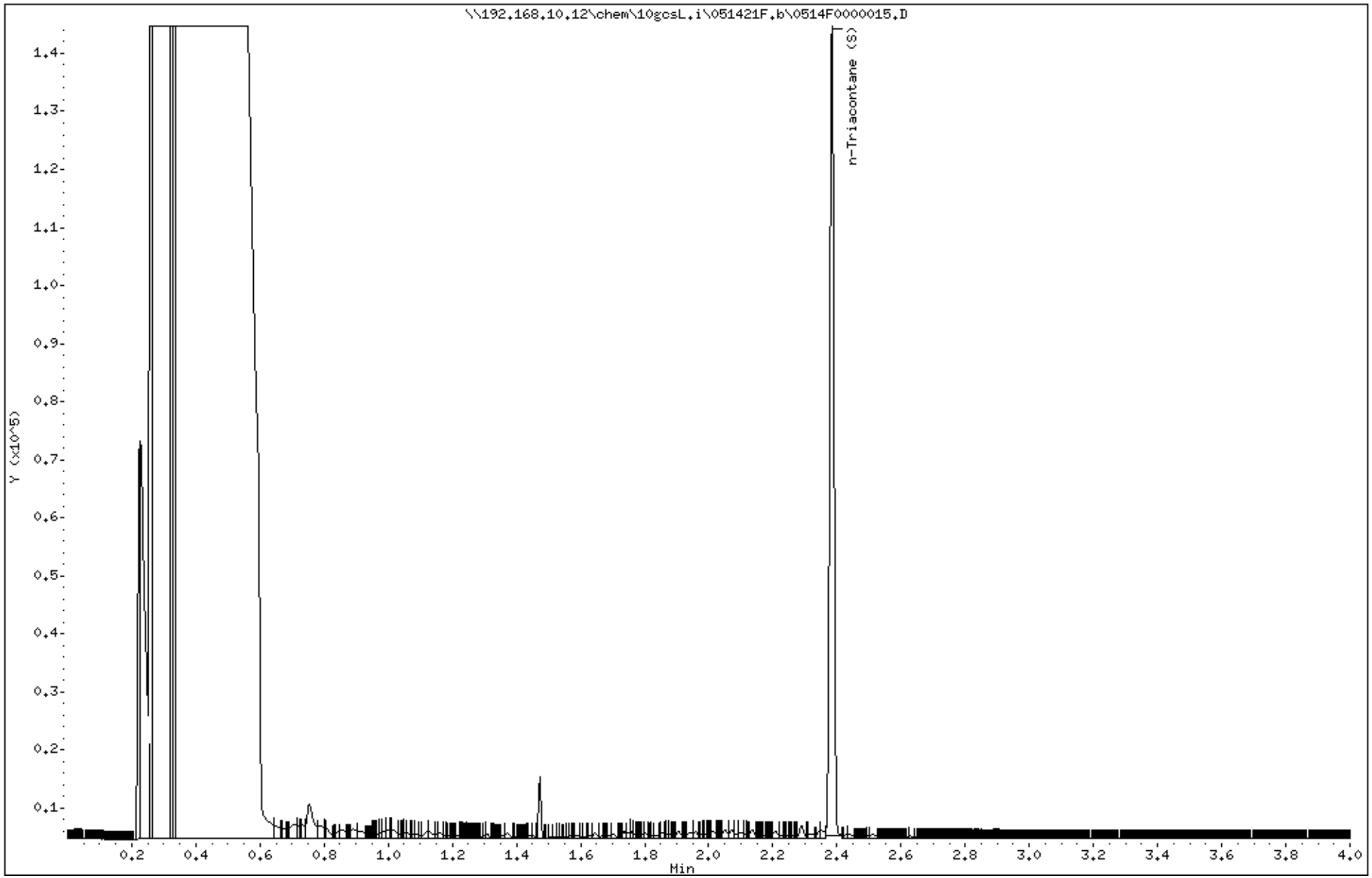
Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000014.D
Date : 14-MAY-2021 11:17
Client ID: SW27-MW04
Sample Info: 10559712002
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000015.D
Date : 14-MAY-2021 11:24
Client ID: SW27-MW05
Sample Info: 10559712003
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PFAAs

Report Information:

Pace Project #: 10559714
Sample Receipt Date: 05/11/2021
Client Project #: 200402 SW#27 Vadnais Heights
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Krista Carlson, your Pace Project Manager.

This report has been reviewed by:

June 01, 2021
Krista Carlson, Project Manager

(612) 607-1700 (fax)
krista.carlson@pacelabs.com

Report Prepared Date:
May 28, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

DISCUSSION

This report presents the results from the analysis performed on three samples submitted by a representative of Bay West LLC. The samples were analyzed for thirty-six perfluorinated compounds using MPCA Guidance. Reporting limits were set to the quantitation limits.

A laboratory method blank was prepared and analyzed with each sample batch as part of our routine quality control procedures. The results show the blanks to be free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

Laboratory spike sample was also prepared with the sample batch using clean reference matrix that had been fortified with native standards. The recovery results were within the method limits. The RPDs (relative percent differences) between one designated spike and its duplicate were within the method limits. These spikes indicate that extraction performed as expected. A matrix spike was prepared with the sample batch using sample material from a separate project; results from that analysis will be provided upon request.

Diminished extracted internal standard (EIS) recovery (outside the suggested limits) were present in the sample material, however, the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard.

Samples had elevated EIS recoveries (outside the suggested limits) for FTS flagged ("R"). While the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard, in the case of this FTS compound, the recoveries are anomalously high, and are adversely impacted by matrix. The results for these native compounds should be considered estimated only.

The four injection internal standards (13C4_PFOA, 13C4_PFOS, 13C2_PFDA, and 13C2_PFHxA) pass for each analysis in the batch verifying that the instrument detector is working as expected.

Values were flagged "I" where incorrect isotope ratios were obtained.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Information		Section E — MPCA Information	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Numbe	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter	Facility Code:	SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com						

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives: HCl; none; none; none; H2SO4

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Requested Analysis: DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen	Comments
1	~~847409~~	~~SW27-MW01~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	omit - TT
2	~~847410~~	~~SW27-MW02~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	"
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground	5-11-21	1000	9	X	X	X	X	X	1
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground	5-11-21	1230	9	X	X	X	X	X	2
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground	5-11-21	1510	9	X	X	X	X	X	3
6	~~854580~~	~~SW27-MW06~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	omit - TT
7	~~854578~~	~~SW27-MW07~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	"
8	~~854579~~	~~SW27-MW08~~	~~Sample~~	~~G~~	~~WG~~	~~NW~~	~~Wtr-Ground~~				X	X	X	X	X	"
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted T / Bay West	5-11-21	1692	[illegible] - Pace	05-11-21	1640

SAMPLE CONDITIONS

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
5.9,4.7	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Toege

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 5-11-21

WO# : 10559714

10559714

Report No.....10559714_TD36_DFR

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Bay West

Project #:

WO#: 10559714
PM: KAC Due Date: 05/25/21
CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☒ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☐ OS418-LS ☐ T4(0254) ☒ T5(0489) ☐ 160285052 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☐ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☐ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 5.9, 4.3 °C **Average Corrected Temp (no temp blank only):** _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

Correction Factor: True **Cooler Temp Corrected w/temp blank:** 5.9, 4.3 °C

USDA Regulated Soil: (☒ N/A, water sample/Other: _____)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Date/Initials of Person Examining Contents: HB 5/12/21
Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☒ Yes	☐ No		1.
Chain of Custody Relinquished?	☒ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☒ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☒ No		6.
Sufficient Volume?	☒ Yes	☐ No		7.
Correct Containers Used? -Pace Containers Used?	☒ Yes ☒ Yes	☐ No ☐ No		8.
Containers Intact?	☒ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☒ Water ☐ Soil ☐ Oil ☐ Other _____	☒ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
All containers needing acid/base preservation have been checked?	☒ Yes	☐ No	☐ N/A	12. Sample # 001 - 003
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☒ Yes	☐ No	☐ N/A	☐ NaOH ☒ HNO_3 1/1 ☒ H_2SO_4 1/1 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒ Yes	☐ No	☐ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine | 0-6 Roll | 0-6 Strip 221419 | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☒ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☒ N/A	
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 05/12/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: CA HB 03

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714001	Total Amount Extracted	495mL
Lab File ID	A210517B_016	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 10:00	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	58.1	0.505	0.505	0.152	1	375-22-4	
PFPeA	13.8	0.505	0.505	0.099	1	2706-90-3	
HFPO-DA	ND	0.505	0.505	0.094	1	13252-13-6	
PFBS	17.1	0.447	0.447	0.103	1	375-73-5	
PFHxA	44.3	0.505	0.505	0.113	1	307-24-4	
4:2 FTS	ND	0.472	0.472	0.151	1	757124-72-4	
PFPeS	11.3	0.475	0.475	0.118	1	2706-91-4	
PFHpA	9.60	0.505	0.505	0.139	1	375-85-9	
DONA	ND	0.477	0.477	0.121	1	919005-14-4	
PFHxS	87.3	0.460	0.460	0.078	1	355-46-4	
PFOA	56.9	0.505	0.505	0.090	1	335-67-1	
6:2 FTS	ND	0.480	0.480	0.158	1	27619-97-2	
PFHpS	ND	0.480	0.480	0.119	1	375-92-8	
PFNA	ND	0.505	0.505	0.091	1	375-95-1	
PFOSAm	ND	0.505	0.505	0.109	1	754-91-6	
PFOS	2.46 I	0.467	0.467	0.091	1	1763-23-1	
MeFOSA	ND	0.505	0.505	0.163	1	31506-32-8	
PFDA	ND	0.505	0.505	0.121	1	335-76-2	
EtFOSAm	ND	0.505	0.505	0.153	1	4151-50-2	
8:2 FTS	ND	0.485	0.485	0.158	1	39108-34-4	
9-Cl-PF3ON	ND	0.471	0.471	0.138	1	756426-58-1	
PFNS	ND	0.485	0.485	0.109	1	68259-12-1	
PFUnDA	ND	0.505	0.505	0.168	1	2058-94-8	
NMeFOSAA	ND	0.505	0.505	0.145	1	2355-31-9	
NEtFOSAA	ND	0.505	0.505	0.135	1	2991-50-6	
PFDS	ND	0.487	0.487	0.117	1	335-77-3	
PFDOA	ND	0.505	0.505	0.164	1	307-55-1	
MeFOSE	ND	0.505	0.505	0.109	1	24448-09-7	
10:2 FTS	ND	0.487	0.487	0.128	1	120226-60-0	
EtFOSE	ND	0.505	0.505	0.138	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.476	0.476	0.122	1	763051-92-9	
PFTrDA	ND	0.505	0.505	0.165	1	72629-94-8	
PFDoS	ND	0.489	0.489	0.127	1	79780-39-5	
PFTDA	ND	0.505	0.505	0.083	1	376-06-7	
PFHXDA	ND	0.505	0.505	0.126	1	67905-19-5	
PFODA	ND	0.505	0.505	0.166	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714001	Total Amount Extracted	495mL
Lab File ID	A210517B_016	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 10:00	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.1	7.06	70	50-200	
13C4_PFOA	10.1	9.75	97	50-200	
13C2_PFDA	10.1	12.5	124	50-200	
13C4_PFOS	9.67	10.0	104	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.1	4.37	**43**	50-200	R
13C5_PFPeA	10.1	5.13	51	50-200	
13C3_PFBS	9.39	7.54	80	50-200	
13C2_4:2FTS	9.45	19.1	**202**	50-200	R
13C5_PFHxA	10.1	6.67	66	50-200	
13C4_PFHpA	10.1	8.84	87	50-200	
13C3_PFHxS	9.56	8.92	93	50-200	
13C2_6:2FTS	9.59	27.1	**283**	50-200	R
13C8_PFOA	10.1	9.41	93	50-200	
13C9_PFNA	10.1	10.6	105	50-200	
13C8_PFOS	9.67	9.95	103	50-200	
13C2_8:2FTS	9.68	28.1	**290**	50-200	R
13C6_PFDA	10.1	11.2	110	50-200	
d3-MeFOSAA	10.1	14.4	143	50-200	
13C8_PFOSA	10.1	7.93	78	50-200	
d5-EtFOSAA	10.1	16.5	163	50-200	
13C7_PFUdA	10.1	14.8	146	50-200	
13C2_PFDoA	10.1	13.1	130	50-200	
13C2_PFTeDA	10.1	12.2	120	50-200	
13C3_HFPO-DA	10.1	7.23	72	50-200	
13C2_PFHxDA	10.1	11.1	110	50-200	
d7-N-MeFOSE	10.1	4.91	**49**	50-200	R
d9-N-EtFOSE	10.1	4.65	**46**	50-200	R
d3-N-MeFOSA	10.1	2.28	**23**	50-200	R
d5-N-EtFOSA	10.1	1.72	**17**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714001	Total Amount Extracted	495mL
Lab File ID	A210517B_016	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 10:00	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	R
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.21	5.21	
13C2_4:2FTS	N/A	N/A	4.80	4.80	R
13C5_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFHpA	N/A	N/A	5.55	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	R
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	R
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.87	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.82	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.24	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	R
d9-N-EtFOSE	N/A	N/A	10.61	10.59	R
d3-N-MeFOSA	N/A	N/A	10.26	10.23	R
d5-N-EtFOSA	N/A	N/A	10.92	10.89	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW03	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714001	Total Amount Extracted	495mL
Lab File ID	A210517B_016	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 10:00	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.56	3.57	
PFPeA	N/A	N/A	4.42	4.42	
HFPO-DA	1.20	0.450	5.25	5.25	
PFBS	0.330	0.330	5.22	5.22	
PFHxA	0.068	0.0660	5.04	5.04	
4:2 FTS	11.0	0.580	4.80	4.80	
PFPeS	0.320	0.310	5.80	5.80	
PFHpA	0.300	0.300	5.56	5.56	
DONA	0.770	0.530	5.73	5.73	
PFHxS	0.260	0.270	6.31	6.32	
PFOA	0.470	0.390	6.03	6.03	
6:2 FTS	0.760	0.460	5.79	5.79	
PFHpS	0.260	0.230	6.79	6.80	
PFNA	0.200	0.210	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.080	0.220	7.06	7.27	I
MeFOSA	2.20	0.870	10.27	10.25	
PFDA	0.086	0.0940	6.94	6.95	
EtFOSAm	0.000	0.720	0.00	10.92	
8:2 FTS	0.000	0.630	6.68	6.69	
9-Cl-PF3ON	1.20	0.0230	7.57	7.59	
PFNS	0.000	0.260	0.00	7.71	
PFUnDA	0.350	0.100	7.39	7.39	
NMeFOSAA	0.590	0.570	6.89	6.89	
NEtFOSAA	0.000	0.720	7.10	7.10	
PFDS	0.520	0.240	8.14	8.14	
PFDOA	0.170	0.130	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.720	7.55	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.000	0.0140	8.44	8.44	
PFTrDA	0.200	0.150	8.27	8.26	
PFDoS	0.260	0.230	8.93	8.93	
PFTDA	0.039	0.130	8.69	8.68	
PFHXDA	0.130	0.120	9.44	9.44	
PFODA	0.073	0.100	10.51	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714002	Total Amount Extracted	508mL
Lab File ID	A210517B_017	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 12:30	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	13.3	0.492	0.492	0.148	1	375-22-4	
PFPeA	1.44	0.492	0.492	0.097	1	2706-90-3	
HFPO-DA	ND	0.492	0.492	0.092	1	13252-13-6	
PFBS	5.57	0.436	0.436	0.100	1	375-73-5	
PFHxA	1.39	0.492	0.492	0.110	1	307-24-4	
4:2 FTS	ND	0.460	0.460	0.147	1	757124-72-4	
PFPeS	1.77	0.463	0.463	0.115	1	2706-91-4	
PFHpA	0.643	0.492	0.492	0.136	1	375-85-9	
DONA	ND	0.465	0.465	0.118	1	919005-14-4	
PFHxS	3.74	0.448	0.448	0.076	1	355-46-4	
PFOA	5.28	0.492	0.492	0.088	1	335-67-1	
6:2 FTS	ND	0.468	0.468	0.154	1	27619-97-2	
PFHpS	ND	0.468	0.468	0.116	1	375-92-8	
PFNA	ND	0.492	0.492	0.089	1	375-95-1	
PFOSAm	ND	0.492	0.492	0.106	1	754-91-6	
PFOS	5.62 I	0.456	0.456	0.089	1	1763-23-1	
MeFOSA	ND	0.492	0.492	0.159	1	31506-32-8	
PFDA	ND	0.492	0.492	0.118	1	335-76-2	
EtFOSAm	ND	0.492	0.492	0.149	1	4151-50-2	
8:2 FTS	ND	0.473	0.473	0.154	1	39108-34-4	
9-Cl-PF3ON	ND	0.459	0.459	0.135	1	756426-58-1	
PFNS	ND	0.473	0.473	0.106	1	68259-12-1	
PFUnDA	ND	0.492	0.492	0.164	1	2058-94-8	
NMeFOSAA	ND	0.492	0.492	0.142	1	2355-31-9	
NEtFOSAA	ND	0.492	0.492	0.132	1	2991-50-6	
PFDS	ND	0.475	0.475	0.114	1	335-77-3	
PFDOA	ND	0.492	0.492	0.160	1	307-55-1	
MeFOSE	ND	0.492	0.492	0.106	1	24448-09-7	
10:2 FTS	ND	0.475	0.475	0.125	1	120226-60-0	
EtFOSE	ND	0.492	0.492	0.135	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.464	0.464	0.119	1	763051-92-9	
PFTrDA	ND	0.492	0.492	0.161	1	72629-94-8	
PFDoS	ND	0.477	0.477	0.124	1	79780-39-5	
PFTDA	ND	0.492	0.492	0.081	1	376-06-7	
PFHXDA	ND	0.492	0.492	0.123	1	67905-19-5	
PFODA	ND	0.492	0.492	0.162	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714002	Total Amount Extracted	508mL
Lab File ID	A210517B_017	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 12:30	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.85	9.22	94	50-200	
13C4_PFOA	9.85	10.0	102	50-200	
13C2_PFDA	9.85	10.5	106	50-200	
13C4_PFOS	9.43	8.97	95	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.85	6.19	63	50-200	
13C5_PFPeA	9.85	7.54	77	50-200	
13C3_PFBS	9.15	8.79	96	50-200	
13C2_4:2FTS	9.21	18.5	**201**	50-200	R
13C5_PFHxA	9.85	9.52	97	50-200	
13C4_PFHpA	9.85	10.4	106	50-200	
13C3_PFHxS	9.32	8.78	94	50-200	
13C2_6:2FTS	9.35	13.9	149	50-200	
13C8_PFOA	9.85	9.68	98	50-200	
13C9_PFNA	9.85	10.1	103	50-200	
13C8_PFOS	9.43	9.08	96	50-200	
13C2_8:2FTS	9.44	10.9	116	50-200	
13C6_PFDA	9.85	10.1	102	50-200	
d3-MeFOSAA	9.85	10.4	105	50-200	
13C8_PFOSA	9.85	5.19	53	50-200	
d5-EtFOSAA	9.85	9.67	98	50-200	
13C7_PFUdA	9.85	11.1	113	50-200	
13C2_PFDoA	9.85	10.8	109	50-200	
13C2_PFTeDA	9.85	8.33	85	50-200	
13C3_HFPO-DA	9.85	9.02	92	50-200	
13C2_PFHxDA	9.85	5.95	60	50-200	
d7-N-MeFOSE	9.85	5.23	53	50-200	
d9-N-EtFOSE	9.85	5.28	54	50-200	
d3-N-MeFOSA	9.85	4.60	**47**	50-200	R
d5-N-EtFOSA	9.85	4.63	**47**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714002	Total Amount Extracted	508mL
Lab File ID	A210517B_017	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 12:30	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.02	6.03	
13C2_PFDA	N/A	N/A	6.93	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.21	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	R
13C5_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFHpA	N/A	N/A	5.55	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.87	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.82	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.00	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.25	10.23	R
d5-N-EtFOSA	N/A	N/A	10.92	10.89	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW04	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714002	Total Amount Extracted	508mL
Lab File ID	A210517B_017	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 12:30	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.56	3.57	
PFPeA	N/A	N/A	4.42	4.42	
HFPO-DA	0.680	0.450	5.26	5.25	
PFBS	0.330	0.330	5.22	5.22	
PFHxA	0.075	0.0660	5.04	5.04	
4:2 FTS	0.000	0.580	4.80	4.80	
PFPeS	0.310	0.310	5.80	5.80	
PFHpA	0.280	0.300	5.56	5.56	
DONA	0.670	0.530	5.74	5.73	
PFHxS	0.220	0.270	6.32	6.32	
PFOA	0.420	0.390	6.03	6.03	
6:2 FTS	0.370	0.460	5.79	5.79	
PFHpS	0.240	0.230	6.79	6.80	
PFNA	0.170	0.210	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.087	0.220	7.08	7.27	I
MeFOSA	0.920	0.870	10.27	10.25	
PFDA	0.110	0.0940	6.94	6.95	
EtFOSAm	0.750	0.720	10.95	10.92	
8:2 FTS	0.000	0.630	0.00	6.69	
9-Cl-PF3ON	0.000	0.0230	7.57	7.59	
PFNS	0.000	0.260	0.00	7.71	
PFUnDA	0.100	0.100	7.38	7.39	
NMeFOSAA	0.600	0.570	6.89	6.89	
NEtFOSAA	0.000	0.720	7.10	7.10	
PFDS	0.000	0.240	8.14	8.14	
PFDOA	0.170	0.130	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.720	0.00	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.000	0.0140	8.45	8.44	
PFTrDA	0.130	0.150	8.28	8.26	
PFDoS	0.000	0.230	8.93	8.93	
PFTDA	0.085	0.130	8.68	8.68	
PFHXDA	0.120	0.120	9.44	9.44	
PFODA	0.110	0.100	10.52	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714003	Total Amount Extracted	482mL
Lab File ID	A210517B_018	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 15:10	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	53.1	0.519	0.519	0.156	1	375-22-4	
PFPeA	ND	0.519	0.519	0.103	1	2706-90-3	
HFPO-DA	ND	0.519	0.519	0.097	1	13252-13-6	
PFBS	0.827	0.459	0.459	0.106	1	375-73-5	
PFHxA	ND	0.519	0.519	0.116	1	307-24-4	
4:2 FTS	ND	0.485	0.485	0.155	1	757124-72-4	
PFPeS	ND	0.488	0.488	0.121	1	2706-91-4	
PFHpA	ND	0.519	0.519	0.143	1	375-85-9	
DONA	ND	0.490	0.490	0.124	1	919005-14-4	
PFHxS	0.659	0.472	0.472	0.080	1	355-46-4	
PFOA	0.627	0.519	0.519	0.092	1	335-67-1	
6:2 FTS	ND	0.493	0.493	0.162	1	27619-97-2	
PFHpS	ND	0.493	0.493	0.122	1	375-92-8	
PFNA	ND	0.519	0.519	0.094	1	375-95-1	
PFOSAm	ND	0.519	0.519	0.112	1	754-91-6	
PFOS	ND	0.480	0.480	0.094	1	1763-23-1	
MeFOSA	ND	0.519	0.519	0.167	1	31506-32-8	
PFDA	ND	0.519	0.519	0.124	1	335-76-2	
EtFOSAm	ND	0.519	0.519	0.157	1	4151-50-2	
8:2 FTS	ND	0.498	0.498	0.162	1	39108-34-4	
9-Cl-PF3ON	ND	0.483	0.483	0.142	1	756426-58-1	
PFNS	ND	0.498	0.498	0.112	1	68259-12-1	
PFUnDA	ND	0.519	0.519	0.172	1	2058-94-8	
NMeFOSAA	ND	0.519	0.519	0.149	1	2355-31-9	
NEtFOSAA	ND	0.519	0.519	0.139	1	2991-50-6	
PFDS	ND	0.501	0.501	0.120	1	335-77-3	
PFDOA	ND	0.519	0.519	0.168	1	307-55-1	
MeFOSE	ND	0.519	0.519	0.112	1	24448-09-7	
10:2 FTS	ND	0.500	0.500	0.132	1	120226-60-0	
EtFOSE	ND	0.519	0.519	0.142	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.489	0.489	0.126	1	763051-92-9	
PFTrDA	ND	0.519	0.519	0.169	1	72629-94-8	
PFDoS	ND	0.502	0.502	0.131	1	79780-39-5	
PFTDA	ND	0.519	0.519	0.085	1	376-06-7	
PFHXDA	ND	0.519	0.519	0.130	1	67905-19-5	
PFODA	ND	0.519	0.519	0.170	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714003	Total Amount Extracted	482mL
Lab File ID	A210517B_018	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 15:10	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.4	12.0	116	50-200	
13C4_PFOA	10.4	12.7	122	50-200	
13C2_PFDA	10.4	13.3	128	50-200	
13C4_PFOS	9.93	11.6	117	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.4	11.8	114	50-200	
13C5_PFPeA	10.4	11.9	114	50-200	
13C3_PFBS	9.64	11.2	116	50-200	
13C2_4:2FTS	9.70	13.0	134	50-200	
13C5_PFHxA	10.4	12.2	118	50-200	
13C4_PFHpA	10.4	12.4	120	50-200	
13C3_PFHxS	9.81	11.3	116	50-200	
13C2_6:2FTS	9.85	13.6	138	50-200	
13C8_PFOA	10.4	11.7	113	50-200	
13C9_PFNA	10.4	12.5	121	50-200	
13C8_PFOS	9.93	11.3	114	50-200	
13C2_8:2FTS	9.94	13.3	134	50-200	
13C6_PFDA	10.4	12.4	120	50-200	
d3-MeFOSAA	10.4	13.7	132	50-200	
13C8_PFOSA	10.4	6.38	62	50-200	
d5-EtFOSAA	10.4	11.8	114	50-200	
13C7_PFUdA	10.4	13.8	133	50-200	
13C2_PFDoA	10.4	12.7	123	50-200	
13C2_PFTeDA	10.4	11.0	106	50-200	
13C3_HFPO-DA	10.4	11.2	108	50-200	
13C2_PFHxDA	10.4	9.70	93	50-200	
d7-N-MeFOSE	10.4	6.45	62	50-200	
d9-N-EtFOSE	10.4	6.55	63	50-200	
d3-N-MeFOSA	10.4	5.35	52	50-200	
d5-N-EtFOSA	10.4	5.62	54	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714003	Total Amount Extracted	482mL
Lab File ID	A210517B_018	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 15:10	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.22	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFHpA	N/A	N/A	5.55	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.87	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.38	7.39	
13C2_PFDoA	N/A	N/A	7.83	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.00	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.25	10.23	
d5-N-EtFOSA	N/A	N/A	10.92	10.89	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW05	Extraction Date	05/13/2021 14:30
Lab Sample ID	10559714003	Total Amount Extracted	482mL
Lab File ID	A210517B_018	Ical ID	210512A03
Matrix	Ground_Water	CCal File	A210517B_014
Collected	05/11/2021 15:10	Ending CCal File	A210517B_032
Received	05/11/2021 16:40	Blank File	A210517B_004

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.57	3.57	
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.270	0.450	5.26	5.25	
PFBS	0.320	0.330	5.22	5.22	
PFHxA	0.068	0.0660	5.04	5.04	
4:2 FTS	0.470	0.580	4.81	4.80	
PFPeS	0.330	0.310	5.81	5.80	
PFHpA	0.270	0.300	5.56	5.56	
DONA	0.420	0.530	5.74	5.73	
PFHxS	0.250	0.270	6.32	6.32	
PFOA	0.390	0.390	6.03	6.03	
6:2 FTS	0.530	0.460	5.79	5.79	
PFHpS	0.600	0.230	6.79	6.80	
PFNA	0.110	0.210	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.052	0.220	7.27	7.27	
MeFOSA	0.680	0.870	10.27	10.25	
PFDA	0.067	0.0940	6.94	6.95	
EtFOSAm	0.330	0.720	10.94	10.92	
8:2 FTS	0.000	0.630	6.69	6.69	
9-Cl-PF3ON	0.000	0.0230	7.59	7.59	
PFNS	0.000	0.260	7.73	7.71	
PFUnDA	0.300	0.100	7.38	7.39	
NMeFOSAA	1.80	0.570	6.88	6.89	
NEtFOSAA	0.000	0.720	0.00	7.10	
PFDS	0.350	0.240	8.14	8.14	
PFDOA	0.130	0.130	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.720	0.00	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.270	0.0140	8.45	8.44	
PFTrDA	0.180	0.150	8.27	8.26	
PFDoS	0.000	0.230	8.93	8.93	
PFTDA	0.140	0.130	8.68	8.68	
PFHXDA	0.120	0.120	9.44	9.44	
PFODA	0.360	0.100	10.53	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	ND	0.495	0.495	0.148	1	375-22-4	
PFPeA	ND	0.495	0.495	0.097	1	2706-90-3	
HFPO-DA	ND	0.495	0.495	0.092	1	13252-13-6	
PFBS	ND	0.438	0.438	0.101	1	375-73-5	
PFHxA	ND	0.495	0.495	0.111	1	307-24-4	
4:2 FTS	ND	0.463	0.463	0.148	1	757124-72-4	
PFPeS	ND	0.465	0.465	0.116	1	2706-91-4	
PFHpA	ND	0.495	0.495	0.137	1	375-85-9	
DONA	ND	0.468	0.468	0.119	1	919005-14-4	
PFHxS	ND	0.450	0.450	0.076	1	355-46-4	
PFOA	ND	0.495	0.495	0.088	1	335-67-1	
6:2 FTS	ND	0.470	0.470	0.154	1	27619-97-2	
PFHpS	ND	0.470	0.470	0.117	1	375-92-8	
PFNA	ND	0.495	0.495	0.089	1	375-95-1	
PFOSAm	ND	0.495	0.495	0.107	1	754-91-6	
PFOS	ND	0.458	0.458	0.089	1	1763-23-1	
MeFOSA	ND	0.495	0.495	0.159	1	31506-32-8	
PFDA	ND	0.495	0.495	0.119	1	335-76-2	
EtFOSAm	ND	0.495	0.495	0.149	1	4151-50-2	
8:2 FTS	ND	0.475	0.475	0.154	1	39108-34-4	
9-Cl-PF3ON	ND	0.461	0.461	0.136	1	756426-58-1	
PFNS	ND	0.475	0.475	0.107	1	68259-12-1	
PFUnDA	ND	0.495	0.495	0.164	1	2058-94-8	
NMeFOSAA	ND	0.495	0.495	0.143	1	2355-31-9	
NEtFOSAA	ND	0.495	0.495	0.133	1	2991-50-6	
PFDS	ND	0.478	0.478	0.115	1	335-77-3	
PFDOA	ND	0.495	0.495	0.160	1	307-55-1	
MeFOSE	ND	0.495	0.495	0.107	1	24448-09-7	
10:2 FTS	ND	0.477	0.477	0.126	1	120226-60-0	
EtFOSE	ND	0.495	0.495	0.136	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.466	0.466	0.120	1	763051-92-9	
PFTrDA	ND	0.495	0.495	0.161	1	72629-94-8	
PFDoS	ND	0.479	0.479	0.125	1	79780-39-5	
PFTDA	ND	0.495	0.495	0.081	1	376-06-7	
PFHXDA	ND	0.495	0.495	0.124	1	67905-19-5	
PFODA	ND	0.495	0.495	0.162	1	16517-11-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.90	10.1	102	50-200	
13C4_PFOA	9.90	10.8	109	50-200	
13C2_PFDA	9.90	10.7	108	50-200	
13C4_PFOS	9.47	10.2	108	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.90	10.6	107	50-200	
13C5_PFPeA	9.90	10.0	101	50-200	
13C3_PFBS	9.20	9.21	100	50-200	
13C2_4:2FTS	9.26	11.3	122	50-200	
13C5_PFHxA	9.90	10.2	103	50-200	
13C4_PFHpA	9.90	10.6	107	50-200	
13C3_PFHxS	9.37	9.41	100	50-200	
13C2_6:2FTS	9.40	11.8	126	50-200	
13C8_PFOA	9.90	9.99	101	50-200	
13C9_PFNA	9.90	10.4	105	50-200	
13C8_PFOS	9.47	9.43	100	50-200	
13C2_8:2FTS	9.48	10.2	107	50-200	
13C6_PFDA	9.90	10.3	104	50-200	
d3-MeFOSAA	9.90	12.4	125	50-200	
13C8_PFOSA	9.90	6.65	67	50-200	
d5-EtFOSAA	9.90	11.9	120	50-200	
13C7_PFUdA	9.90	11.0	111	50-200	
13C2_PFDoA	9.90	10.7	108	50-200	
13C2_PFTeDA	9.90	9.77	99	50-200	
13C3_HFPO-DA	9.90	9.70	98	50-200	
13C2_PFHxDA	9.90	8.85	89	50-200	
d7-N-MeFOSE	9.90	6.36	64	50-200	
d9-N-EtFOSE	9.90	6.41	65	50-200	
d3-N-MeFOSA	9.90	5.88	59	50-200	
d5-N-EtFOSA	9.90	6.18	62	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.03	5.03	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.94	6.94	
13C4_PFOS	N/A	N/A	7.25	7.26	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.56	3.56	
13C5_PFPeA	N/A	N/A	4.42	4.42	
13C3_PFBS	N/A	N/A	5.22	5.21	
13C2_4:2FTS	N/A	N/A	4.81	4.80	
13C5_PFHxA	N/A	N/A	5.04	5.03	
13C4_PFHpA	N/A	N/A	5.56	5.55	
13C3_PFHxS	N/A	N/A	6.31	6.31	
13C2_6:2FTS	N/A	N/A	5.79	5.79	
13C8_PFOA	N/A	N/A	6.03	6.02	
13C9_PFNA	N/A	N/A	6.49	6.49	
13C8_PFOS	N/A	N/A	7.25	7.26	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.94	6.94	
d3-MeFOSAA	N/A	N/A	6.88	6.88	
13C8_PFOSA	N/A	N/A	8.78	8.75	
d5-EtFOSAA	N/A	N/A	7.09	7.09	
13C7_PFUdA	N/A	N/A	7.39	7.39	
13C2_PFDoA	N/A	N/A	7.83	7.83	
13C2_PFTeDA	N/A	N/A	8.68	8.67	
13C3_HFPO-DA	N/A	N/A	5.25	5.24	
13C2_PFHxDA	N/A	N/A	9.44	9.44	
d7-N-MeFOSE	N/A	N/A	10.01	9.99	
d9-N-EtFOSE	N/A	N/A	10.61	10.59	
d3-N-MeFOSA	N/A	N/A	10.26	10.23	
d5-N-EtFOSA	N/A	N/A	10.92	10.89	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKZV	Extraction Date	05/13/2021 14:30
Lab Sample ID	BLANK-89938	Total Amount Extracted	505mL
Lab File ID	A210517B_004	Ical ID	210512A03
Matrix	Water	CCal File	A210517B_002
Collected	05/11/2021 14:25	Ending CCal File	A210517B_014
Received	05/11/2021 14:25	Blank File	

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.57	3.57	
PFPeA	N/A	N/A	4.43	4.42	
HFPO-DA	0.630	0.450	5.26	5.25	
PFBS	0.340	0.320	5.22	5.22	
PFHxA	0.060	0.0610	5.04	5.04	
4:2 FTS	12.0	0.550	4.82	4.80	
PFPeS	0.390	0.300	5.81	5.80	
PFHpA	0.290	0.310	5.56	5.56	
DONA	0.720	0.480	5.73	5.73	
PFHxS	0.230	0.250	6.32	6.32	
PFOA	0.390	0.360	6.03	6.03	
6:2 FTS	0.540	0.580	5.79	5.79	
PFHpS	0.000	0.230	6.80	6.80	
PFNA	0.210	0.200	6.49	6.49	
PFOSAm	N/A	N/A	8.78	8.75	
PFOS	0.200	0.230	7.26	7.27	
MeFOSA	0.800	0.860	10.28	10.25	
PFDA	0.130	0.0980	6.94	6.95	
EtFOSAm	1.80	0.720	10.93	10.92	
8:2 FTS	0.000	0.670	6.68	6.69	
9-Cl-PF3ON	0.000	0.0220	7.59	7.59	
PFNS	0.000	0.250	7.95	7.71	
PFUnDA	0.120	0.0940	7.39	7.39	
NMeFOSAA	0.150	0.560	6.91	6.89	
NEtFOSAA	2.00	0.700	7.10	7.10	
PFDS	0.260	0.230	8.14	8.14	
PFDOA	0.095	0.150	7.83	7.83	
MeFOSE	N/A	N/A	10.05	10.03	
10:2 FTS	0.000	0.630	0.00	7.58	
EtFOSE	0.000	0.000	0.00	10.64	
11-Cl-PF3OUdS	0.180	0.0130	8.45	8.44	
PFTrDA	0.200	0.140	8.27	8.26	
PFDoS	0.000	0.230	8.93	8.93	
PFTDA	0.170	0.140	8.69	8.68	
PFHXDA	0.130	0.120	9.45	9.44	
PFODA	0.210	0.100	10.52	10.53	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.2	10.4	102	50-200	
13C4_PFOA	10.2	10.9	107	50-200	
13C2_PFDA	10.2	10.7	105	50-200	
13C4_PFOS	9.75	9.94	102	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.2	10.5	103	50-200	
13C5_PFPeA	10.2	10.6	104	50-200	
13C3_PFBS	9.47	9.75	103	50-200	
13C2_4:2FTS	9.53	9.10	95	50-200	
13C5_PFHxA	10.2	10.6	104	50-200	
13C4_PFHpA	10.2	10.6	104	50-200	
13C3_PFHxS	9.64	10.0	104	50-200	
13C2_6:2FTS	9.67	9.86	102	50-200	
13C8_PFOA	10.2	10.7	105	50-200	
13C9_PFNA	10.2	10.9	107	50-200	
13C8_PFOS	9.75	10.2	105	50-200	
13C2_8:2FTS	9.76	11.2	115	50-200	
13C6_PFDA	10.2	10.1	99	50-200	
d3-MeFOSAA	10.2	11.5	113	50-200	
13C8_PFOSA	10.2	10.6	104	50-200	
d5-EtFOSAA	10.2	11.2	110	50-200	
13C7_PFUdA	10.2	10.8	106	50-200	
13C2_PFDoA	10.2	10.8	106	50-200	
13C2_PFTeDA	10.2	9.70	95	50-200	
13C3_HFPO-DA	10.2	10.5	103	50-200	
13C2_PFHxDA	10.2	9.30	91	50-200	
d7-N-MeFOSE	10.2	10.2	100	50-200	
d9-N-EtFOSE	10.2	10.3	101	50-200	
d3-N-MeFOSA	10.2	9.83	96	50-200	
d5-N-EtFOSA	10.2	9.87	97	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers	CAS No.
PFBA	4.08	4.30	106	70-130		375-22-4
PFPeA	4.08	4.12	101	70-130		2706-90-3
HFPO-DA	4.08	4.12	101	70-130		13252-13-6
PFBS	3.61	3.82	106	70-130		375-73-5
PFHxA	4.08	4.07	100	70-130		307-24-4
4:2 FTS	3.81	3.99	105	70-130		757124-72-4
PFPeS	3.83	3.97	103	70-130		2706-91-4
PFHpA	4.08	4.19	103	70-130		375-85-9
DONA	3.85	3.81	99	70-130		919005-14-4
PFHxS	3.71	3.75	101	70-130		355-46-4
PFOA	4.08	3.95	97	70-130		335-67-1
6:2 FTS	3.87	3.90	101	70-130		27619-97-2
PFHpS	3.87	3.91	101	70-130		375-92-8
PFNA	4.08	3.89	95	70-130		375-95-1
PFOSAm	4.08	4.03	99	70-130		754-91-6
PFOS	3.77	3.89	103	70-130		1763-23-1
MeFOSA	4.08	4.13	101	70-130		31506-32-8
PFDA	4.08	4.33	106	70-130		335-76-2
EtFOSAm	4.08	4.21	103	70-130		4151-50-2
8:2 FTS	3.91	3.54	90	70-130		39108-34-4
9-Cl-PF3ON	3.80	3.70	97	70-130		756426-58-1
PFNS	3.91	3.72	95	70-130		68259-12-1
PFUnDA	4.08	4.21	103	70-130		2058-94-8
NMeFOSAA	4.08	4.02	99	70-130		2355-31-9
NEtFOSAA	4.08	4.24	104	70-130		2991-50-6
PFDS	3.93	3.69	94	70-130		335-77-3
PFDOA	4.08	4.07	100	70-130		307-55-1
MeFOSE	4.08	4.18	103	70-130		24448-09-7
10:2 FTS	3.93	3.57	91	70-130		120226-60-0
EtFOSE	4.08	4.05	99	70-130		1691-99-2
11-Cl-PF3OUdS	3.84	3.69	96	70-130		763051-92-9
PFTrDA	4.08	3.92	96	70-130		72629-94-8
PFDoS	3.95	3.67	93	70-130		79780-39-5
PFTDA	4.08	4.13	101	70-130		376-06-7
PFHXDA	4.08	4.06	100	70-130		67905-19-5
PFODA	4.08	3.37	83	70-130		16517-11-6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.93	
13C4_PFOS	N/A	N/A	7.28	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.60	3.60	
13C5_PFPeA	N/A	N/A	4.45	4.45	
13C3_PFBS	N/A	N/A	5.25	5.25	
13C2_4:2FTS	N/A	N/A	4.83	4.83	
13C5_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.34	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.03	6.03	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.28	7.29	
13C2_8:2FTS	N/A	N/A	6.68	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.87	6.87	
13C8_PFOSA	N/A	N/A	8.84	8.84	
d5-EtFOSAA	N/A	N/A	7.08	7.08	
13C7_PFUdA	N/A	N/A	7.38	7.38	
13C2_PFDoA	N/A	N/A	7.83	7.84	
13C2_PFTeDA	N/A	N/A	8.70	8.71	
13C3_HFPO-DA	N/A	N/A	5.26	5.26	
13C2_PFHxDA	N/A	N/A	9.49	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.71	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-89939	Instrument ID	10LCMS03
Run File Name	A210525D_003	Column ID	118AB10133
Analyzed	05/26/2021 01:02	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	0.47	0.45	5.27	5.28	
PFBS	0.31	0.33	5.26	5.26	
PFHxA	0.06	0.06	5.06	5.06	
4:2 FTS	0.56	0.56	4.83	4.83	
PFPeS	0.30	0.32	5.83	5.83	
PFHpA	0.28	0.28	5.57	5.57	
DONA	0.50	0.49	5.74	5.75	
PFHxS	0.27	0.26	6.34	6.35	
PFOA	0.36	0.35	6.04	6.04	
6:2 FTS	0.51	0.53	5.80	5.80	
PFHpS	0.24	0.23	6.82	6.83	
PFNA	0.19	0.19	6.49	6.49	
PFOSAm	N/A	N/A	8.84	8.84	
PFOS	0.22	0.23	7.29	7.29	
MeFOSA	0.87	0.87	10.37	10.37	
PFDA	0.08	0.08	6.94	6.94	
EtFOSAm	0.71	0.71	11.07	11.07	
8:2 FTS	0.67	0.70	6.68	6.69	
9-Cl-PF3ON	0.02	0.02	7.61	7.61	
PFNS	0.24	0.24	7.75	7.75	
PFUnDA	0.09	0.09	7.39	7.39	
NMeFOSAA	0.55	0.59	6.87	6.88	
NEtFOSAA	0.67	0.66	7.09	7.09	
PFDS	0.24	0.24	8.19	8.19	
PFDOA	0.13	0.14	7.84	7.84	
MeFOSE	N/A	N/A	10.13	10.13	
10:2 FTS	0.69	0.62	7.57	7.57	
EtFOSE	0.00	0.00	10.77	10.77	
11-Cl-PF3OUdS	0.01	0.01	8.49	8.49	
PFTrDA	0.15	0.15	8.28	8.28	
PFDoS	0.24	0.23	9.00	9.00	
PFTDA	0.14	0.14	8.71	8.71	
PFHXDA	0.12	0.12	9.49	9.49	
PFODA	0.10	0.10	10.64	10.64	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
13C2_PFHxA	10.2	10.4	102	11.0	107	4.6	50-200	
13C4_PFOA	10.2	10.9	107	11.4	111	4.1	50-200	
13C2_PFDA	10.2	10.7	105	11.1	108	3.3	50-200	
13C4_PFOS	9.80	9.94	102	10.3	105	3.4	50-200	

Extracted Internal Standards

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
13C4_PFBA	10.2	10.5	103	11.4	112	7.6	50-200	
13C5_PFPeA	10.2	10.6	104	11.3	110	5.8	50-200	
13C3_PFBS	9.51	9.75	103	10.1	106	2.9	50-200	
13C2_4:2FTS	9.58	9.10	95	10.4	108	12.7	50-200	
13C5_PFHxA	10.2	10.6	104	10.6	103	1.0	50-200	
13C4_PFHpA	10.2	10.6	104	11.3	110	5.5	50-200	
13C3_PFHxS	9.69	10.0	104	9.79	101	2.7	50-200	
13C2_6:2FTS	9.72	9.86	102	10.00	103	0.9	50-200	
13C8_PFOA	10.2	10.7	105	11.5	112	6.2	50-200	
13C9_PFNA	10.2	10.9	107	10.7	105	2.3	50-200	
13C8_PFOS	9.80	10.2	105	10.7	109	3.7	50-200	
13C2_8:2FTS	9.81	11.2	115	11.4	116	1.2	50-200	
13C6_PFDA	10.2	10.1	99	10.7	105	5.6	50-200	
d3-MeFOSAA	10.2	11.5	113	12.1	118	4.6	50-200	
13C8_PFOSA	10.2	10.6	104	10.8	105	1.1	50-200	
d5-EtFOSAA	10.2	11.2	110	12.0	117	5.9	50-200	
13C7_PFUdA	10.2	10.8	106	11.2	110	2.9	50-200	
13C2_PFDoA	10.2	10.8	106	10.9	107	0.9	50-200	
13C2_PFTeDA	10.2	9.70	95	10.2	99	4.2	50-200	
13C3_HFPO-DA	10.2	10.5	103	11.2	110	6.3	50-200	
13C2_PFHxDA	10.2	9.30	91	9.78	96	4.6	50-200	
d7-N-MeFOSE	10.2	10.2	100	10.9	106	6.3	50-200	
d9-N-EtFOSE	10.2	10.3	101	10.8	106	4.4	50-200	
d3-N-MeFOSA	10.2	9.83	96	10.2	100	3.2	50-200	
d5-N-EtFOSA	10.2	9.87	97	10.4	101	4.6	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Known Conc.	LCS Conc. Found	LCS Rec. %	LCSD Conc. Found	LCSD Rec. %	RPD %	Recovery Limits	Qualifiers
PFBA	4.10	4.30	106	4.19	102	3.3	70-130	
PFPeA	4.10	4.12	101	3.97	97	4.3	70-130	
HFPO-DA	4.10	4.12	101	4.00	98	3.5	70-130	
PFBS	3.63	3.82	106	3.66	101	4.7	70-130	
PFHxA	4.10	4.07	100	4.07	99	0.6	70-130	
4:2 FTS	3.83	3.99	105	3.54	92	12.4	70-130	
PFPeS	3.85	3.97	103	4.15	108	4.1	70-130	
PFHpA	4.10	4.19	103	3.80	93	10.2	70-130	
DONA	3.87	3.81	99	3.68	95	3.9	70-130	
PFHxS	3.73	3.75	101	3.99	107	5.8	70-130	
PFOA	4.10	3.95	97	3.89	95	1.9	70-130	
6:2 FTS	3.89	3.90	101	3.94	101	0.5	70-130	
PFHpS	3.89	3.91	101	3.84	99	2.2	70-130	
PFNA	4.10	3.89	95	3.94	96	0.9	70-130	
PFOSAm	4.10	4.03	99	4.20	103	3.7	70-130	
PFOS	3.79	3.89	103	3.64	96	7.2	70-130	
MeFOSA	4.10	4.13	101	4.16	101	0.1	70-130	
PFDA	4.10	4.33	106	4.03	98	7.6	70-130	
EtFOSAm	4.10	4.21	103	4.03	98	4.9	70-130	
8:2 FTS	3.93	3.54	90	3.55	90	0.2	70-130	
9-Cl-PF3ON	3.82	3.70	97	3.61	95	3.0	70-130	
PFNS	3.93	3.72	95	3.62	92	3.2	70-130	
PFUnDA	4.10	4.21	103	4.18	102	1.3	70-130	
NMeFOSAA	4.10	4.02	99	3.80	93	6.3	70-130	
NEtFOSAA	4.10	4.24	104	4.22	103	0.8	70-130	
PFDS	3.95	3.69	94	3.89	98	5.0	70-130	
PFDOA	4.10	4.07	100	4.19	102	2.4	70-130	
MeFOSE	4.10	4.18	103	4.00	98	4.9	70-130	
10:2 FTS	3.95	3.57	91	3.92	99	8.8	70-130	
EtFOSE	4.10	4.05	99	4.00	98	1.8	70-130	
11-Cl-PF3OUdS	3.86	3.69	96	3.72	96	0.3	70-130	
PFTrDA	4.10	3.92	96	4.00	98	1.4	70-130	
PFDoS	3.97	3.67	93	3.73	94	1.1	70-130	
PFTDA	4.10	4.13	101	4.03	98	3.1	70-130	
PFHXDA	4.10	4.06	100	3.99	98	2.2	70-130	
PFODA	4.10	3.37	83	3.21	78	5.4	70-130	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.93	
13C4_PFOS	N/A	N/A	7.28	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.60	3.60	
13C5_PFPeA	N/A	N/A	4.45	4.45	
13C3_PFBS	N/A	N/A	5.25	5.25	
13C2_4:2FTS	N/A	N/A	4.82	4.83	
13C5_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.33	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.03	6.03	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.28	7.29	
13C2_8:2FTS	N/A	N/A	6.67	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.86	6.87	
13C8_PFOSA	N/A	N/A	8.83	8.84	
d5-EtFOSAA	N/A	N/A	7.08	7.08	
13C7_PFUdA	N/A	N/A	7.38	7.38	
13C2_PFDoA	N/A	N/A	7.83	7.84	
13C2_PFTeDA	N/A	N/A	8.70	8.71	
13C3_HFPO-DA	N/A	N/A	5.26	5.26	
13C2_PFHxDA	N/A	N/A	9.48	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.71	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCSD Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCSD-90013	Instrument ID	10LCMS03
Run File Name	A210525D_004	Column ID	118AB10133
Analyzed	05/26/2021 01:17	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	0.48	0.45	5.27	5.28	
PFBS	0.32	0.33	5.25	5.26	
PFHxA	0.06	0.06	5.06	5.06	
4:2 FTS	0.57	0.56	4.83	4.83	
PFPeS	0.30	0.32	5.83	5.83	
PFHpA	0.31	0.28	5.57	5.57	
DONA	0.51	0.49	5.74	5.75	
PFHxS	0.26	0.26	6.34	6.35	
PFOA	0.37	0.35	6.03	6.04	
6:2 FTS	0.50	0.53	5.79	5.80	
PFHpS	0.23	0.23	6.82	6.83	
PFNA	0.20	0.19	6.49	6.49	
PFOSAm	N/A	N/A	8.84	8.84	
PFOS	0.23	0.23	7.29	7.29	
MeFOSA	0.86	0.87	10.36	10.37	
PFDA	0.09	0.08	6.93	6.94	
EtFOSAm	0.72	0.71	11.07	11.07	
8:2 FTS	0.68	0.70	6.67	6.69	
9-Cl-PF3ON	0.02	0.02	7.61	7.61	
PFNS	0.24	0.24	7.74	7.75	
PFUnDA	0.09	0.09	7.39	7.39	
NMeFOSAA	0.55	0.59	6.87	6.88	
NEtFOSAA	0.60	0.66	7.08	7.09	
PFDS	0.23	0.24	8.19	8.19	
PFDOA	0.13	0.14	7.83	7.84	
MeFOSE	N/A	N/A	10.12	10.13	
10:2 FTS	0.61	0.62	7.57	7.57	
EtFOSE	0.00	0.00	10.77	10.77	
11-Cl-PF3OUdS	0.01	0.01	8.49	8.49	
PFTrDA	0.15	0.15	8.28	8.28	
PFDoS	0.23	0.23	9.00	9.00	
PFTDA	0.14	0.14	8.70	8.71	
PFHXDA	0.12	0.12	9.49	9.49	
PFODA	0.11	0.10	10.64	10.64	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

May 26, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on May 12, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sylvia Hunter

Sylvia Hunter
sylvia.hunter@pacelabs.com
1(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab
A2LA Certification #: 2926.01*
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009*
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014*
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605*
Georgia Certification #: 959
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086*
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064*
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137*
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240*
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081*
New Jersey Certification #: MN002
New York Certification #: 11647*
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Ohio VAP Certification (1800) #: CL110*
Oklahoma Certification #: 9507*
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001*
Pennsylvania Certification #: 68-00563*
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192*
Utah Certification #: MN00064*
Vermont Certification #: VT-027053137
Virginia Certification #: 460163*
Washington Certification #: C486*
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208
*Please Note: Applicable air certifications are denoted with an asterisk (*).

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10559952001	**SW27-MW06**	Water	05/12/21 09:20	05/12/21 16:40
10559952002	**SW27-MW07**	Water	05/12/21 11:55	05/12/21 16:40
10559952003	**SW27-MW08**	Water	05/12/21 15:05	05/12/21 16:40
10559952004	**SW27-EB01**	Water	05/12/21 13:00	05/12/21 16:40

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10559952001	**SW27-MW06**	Diesel Range Organics	JVM	4
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1
10559952002	**SW27-MW07**	Diesel Range Organics	JVM	4
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1
10559952003	**SW27-MW08**	Diesel Range Organics	JVM	4
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1
10559952004	**SW27-EB01**	Diesel Range Organics	JVM	4
		EPA 8270E by SIM	MS4	2
		EPA 353.2	JFP	1

PASI-M = Pace Analytical Services - Minneapolis

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Method: **Diesel Range Organics**
Description: WIDRO LV Ext GCS Silica Gel
Client: Bay West LLC
Date: May 26, 2021

General Information:
4 samples were analyzed for Diesel Range Organics by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Method: **EPA 8270E by SIM**
Description: 8270E MSSV 14 Dioxane By SIM
Client: Bay West LLC
Date: May 26, 2021

General Information:
4 samples were analyzed for EPA 8270E by SIM by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA Mod. 3510C with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 741717

S0: Surrogate recovery outside laboratory control limits.

- BLANK (Lab ID: 3955309)
  - 1,4-Dioxane-d8 (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 741717

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Method: **EPA 353.2**
Description: 353.2 Nitrate + Nitrite
Client: Bay West LLC
Date: May 26, 2021

General Information:
4 samples were analyzed for EPA 353.2 by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Sample: SW27-MW06 **Lab ID: 10559952001** Collected: 05/12/21 09:20 Received: 05/12/21 16:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV Ext GCS Silica Gel	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics Pace Analytical Services - Minneapolis								
WDRO C10-C28	**0.036J**	mg/L	0.10	0.029	1	05/13/21 15:11	05/14/21 14:05		
WDRO, Extended C10-C32	**<0.10**	mg/L	0.10	0.10	1	05/13/21 15:11	05/14/21 14:05		
WDRO, Extended C10-C36	**<0.10**	mg/L	0.10	0.10	1	05/13/21 15:11	05/14/21 14:05		
Surrogates									
n-Triacontane (S)	84	%.	34-125		1	05/13/21 15:11	05/14/21 14:05		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 12:20	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	40	%.	30-125		1	05/13/21 09:16	05/14/21 12:20		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.024J**	mg/L	0.10	0.018	1		05/18/21 09:57		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Sample: SW27-MW07 **Lab ID: 10559952002** Collected: 05/12/21 11:55 Received: 05/12/21 16:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV Ext GCS Silica Gel	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.096**	mg/L	0.096	0.028	1	05/13/21 15:11	05/14/21 14:12		
WDRO, Extended C10-C32	**<0.096**	mg/L	0.096	0.096	1	05/13/21 15:11	05/14/21 14:12		
WDRO, Extended C10-C36	**<0.096**	mg/L	0.096	0.096	1	05/13/21 15:11	05/14/21 14:12		
Surrogates									
n-Triacontane (S)	77	%.	34-125		1	05/13/21 15:11	05/14/21 14:12		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 12:55	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	40	%.	30-125		1	05/13/21 09:16	05/14/21 12:55		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**1.3**	mg/L	0.10	0.018	1		05/18/21 10:03		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Sample: SW27-MW08 **Lab ID: 10559952003** Collected: 05/12/21 15:05 Received: 05/12/21 16:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV Ext GCS Silica Gel	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics Pace Analytical Services - Minneapolis								
WDRO C10-C28	**0.18**	mg/L	0.096	0.028	1	05/13/21 15:11	05/14/21 14:19		
WDRO, Extended C10-C32	**0.18**	mg/L	0.096	0.096	1	05/13/21 15:11	05/14/21 14:19		
WDRO, Extended C10-C36	**0.18**	mg/L	0.096	0.096	1	05/13/21 15:11	05/14/21 14:19		
Surrogates									
n-Triacontane (S)	86	%.	34-125		1	05/13/21 15:11	05/14/21 14:19		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 13:12	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	40	%.	30-125		1	05/13/21 09:16	05/14/21 13:12		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**0.61**	mg/L	0.10	0.018	1		05/18/21 10:04		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Sample: SW27-EB01 **Lab ID: 10559952004** Collected: 05/12/21 13:00 Received: 05/12/21 16:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO LV Ext GCS Silica Gel	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics Pace Analytical Services - Minneapolis								
WDRO C10-C28	**<0.098**	mg/L	0.098	0.028	1	05/13/21 15:11	05/14/21 14:26		
WDRO, Extended C10-C32	**<0.098**	mg/L	0.098	0.098	1	05/13/21 15:11	05/14/21 14:26		
WDRO, Extended C10-C36	**<0.098**	mg/L	0.098	0.098	1	05/13/21 15:11	05/14/21 14:26		
Surrogates									
n-Triacontane (S)	90	%.	34-125		1	05/13/21 15:11	05/14/21 14:26		
8270E MSSV 14 Dioxane By SIM	Analytical Method: EPA 8270E by SIM Preparation Method: EPA Mod. 3510C Pace Analytical Services - Minneapolis								
1,4-Dioxane (SIM)	**<0.25**	ug/L	0.25	0.11	1	05/13/21 09:16	05/14/21 13:30	123-91-1	
Surrogates									
1,4-Dioxane-d8 (S)	42	%.	30-125		1	05/13/21 09:16	05/14/21 13:30		
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	**<0.10**	mg/L	0.10	0.018	1		05/18/21 10:05		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

QC Batch: 741717
QC Batch Method: EPA Mod. 3510C
Analysis Method: EPA 8270E by SIM
Analysis Description: 8270E Water 14 Dioxane by SIM
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559952001, 10559952002, 10559952003, 10559952004

METHOD BLANK: 3955309 Matrix: Water
Associated Lab Samples: 10559952001, 10559952002, 10559952003, 10559952004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,4-Dioxane (SIM)	ug/L	<0.25	0.25	0.11	05/14/21 08:49	
1,4-Dioxane-d8 (S)	%.	29	30-125		05/14/21 08:49	S0

LABORATORY CONTROL SAMPLE & LCSD: 3955310 3955311

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,4-Dioxane (SIM)	ug/L	10	9.2	9.5	92	95	59-134	4	20	
1,4-Dioxane-d8 (S)	%.				41	40	30-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

QC Batch: 741963
QC Batch Method: Diesel Range Organics
Analysis Method: Diesel Range Organics
Analysis Description: WIDRO LV Ext GCS with Cleanup
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559952001, 10559952002, 10559952003, 10559952004

METHOD BLANK: 3956694 Matrix: Water
Associated Lab Samples: 10559952001, 10559952002, 10559952003, 10559952004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	<0.10	0.10	0.029	05/14/21 13:51	
WDRO, Extended C10-C32	mg/L	<0.10	0.10	0.10	05/14/21 13:51	
WDRO, Extended C10-C36	mg/L	<0.10	0.10	0.10	05/14/21 13:51	
n-Triacontane (S)	%.	97	34-125		05/14/21 13:51	

LABORATORY CONTROL SAMPLE & LCSD: 3956695 3956696

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	0.8	0.68	0.68	85	85	42-125	0	20	
WDRO, Extended C10-C32	mg/L	0.8	0.67	0.67	84	84	42-125	0	20	
WDRO, Extended C10-C36	mg/L	0.8	0.67	0.67	83	83	42-125	0	20	
n-Triacontane (S)	%.				94	89	34-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

QC Batch: 742695 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10559952001, 10559952002, 10559952003, 10559952004

METHOD BLANK: 3961002 Matrix: Water
Associated Lab Samples: 10559952001, 10559952002, 10559952003, 10559952004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.10	0.10	0.018	05/18/21 10:36	FS

LABORATORY CONTROL SAMPLE: 3961003

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.98	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3961004 3961005

Parameter	Units	10559952001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.024J	1	1	0.97	1.0	95	97	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3961006 3961007

Parameter	Units	10560210001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	8.8	10	10	18.5	19.4	96	106	90-110	5	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 742050

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.

S0 Surrogate recovery outside laboratory control limits.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559952

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10559952001	**SW27-MW06**	Diesel Range Organics	741963	Diesel Range Organics	742155
10559952002	**SW27-MW07**	Diesel Range Organics	741963	Diesel Range Organics	742155
10559952003	**SW27-MW08**	Diesel Range Organics	741963	Diesel Range Organics	742155
10559952004	**SW27-EB01**	Diesel Range Organics	741963	Diesel Range Organics	742155
10559952001	**SW27-MW06**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559952002	**SW27-MW07**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559952003	**SW27-MW08**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559952004	**SW27-EB01**	EPA Mod. 3510C	741717	EPA 8270E by SIM	742050
10559952001	**SW27-MW06**	EPA 353.2	742695		
10559952002	**SW27-MW07**	EPA 353.2	742695		
10559952003	**SW27-MW08**	EPA 353.2	742695		
10559952004	**SW27-EB01**	EPA 353.2	742695		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10559952

10559952

001

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Informat			
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Numbe	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter	Facility Code:	SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com						

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives: HCl; none; none; none; H_2SO_4

Requested Analysis: DRO with silica gel cleanup (WI DRO); 2,3,7,8 TCD (Dioxin) - (EPA 8290A); 1,4-Dioxane (Analyzed as a single compound) - (8270 SIM); PFAS; Nitrate + Nitrite, as Nitrogen

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen	Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground				X	X	X	X	X	omit-TT
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X	"
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	5-12-21	0920	9	X	X	X	X	X	001
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	5-12-21	1155	9	X	X	X	X	X	002
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	5-12-21	1505	9	X	X	X	X	X	003
9	847410	SW27-MW02-D	QC-FR	G	WG	NW	Wtr-Ground				X	X	X	X	X	omit-TT
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	5-12-21	1300	9	X	X	X	X	X	004
11																
12																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted T/Bay West	5-12-21	1640	Cathy - Pace	5/12/21	1640

SAMPLE CONDITIONS

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
4.1, 3.9	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Troege

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 5-12-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Baywest

Project #: WO#: 10559952

PM: SH1 Due Date: 05/26/21

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☑Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐OS418-LS ☐T4(0254) ☑T5(0489) ☐160285052 **Type of Ice:** ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No **Were All Container Temps Taken?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 4.1,3.5 °C

Correction Factor: 0.0 **Cooler Temp Corrected w/temp blank:** 4.1,3.5 °C

Average Corrected Temp (no temp blank only): _____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

USDA Regulated Soil: (☑N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

Date/Initials of Person Examining Contents: 5/13/21 IJ

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑Yes	☐No		1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used? -Pace Containers Used?	☑Yes ☑Yes	☐No ☐No		8.
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑Water ☐Soil ☐Oil ☐Other_____	☑Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑Yes	☐No	☐N/A	12. Sample # 1-4 ☐NaOH ☑HNO_3 ☑H_2SO_4 ☐Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑Yes	☐No	☐N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine: 0-6 Roll 221419 / 0-6 Strip / 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	
Trip Blank Present?	☐Yes	☐No	☑N/A	14. Pace Trip Blank Lot # (if purchased):_____
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

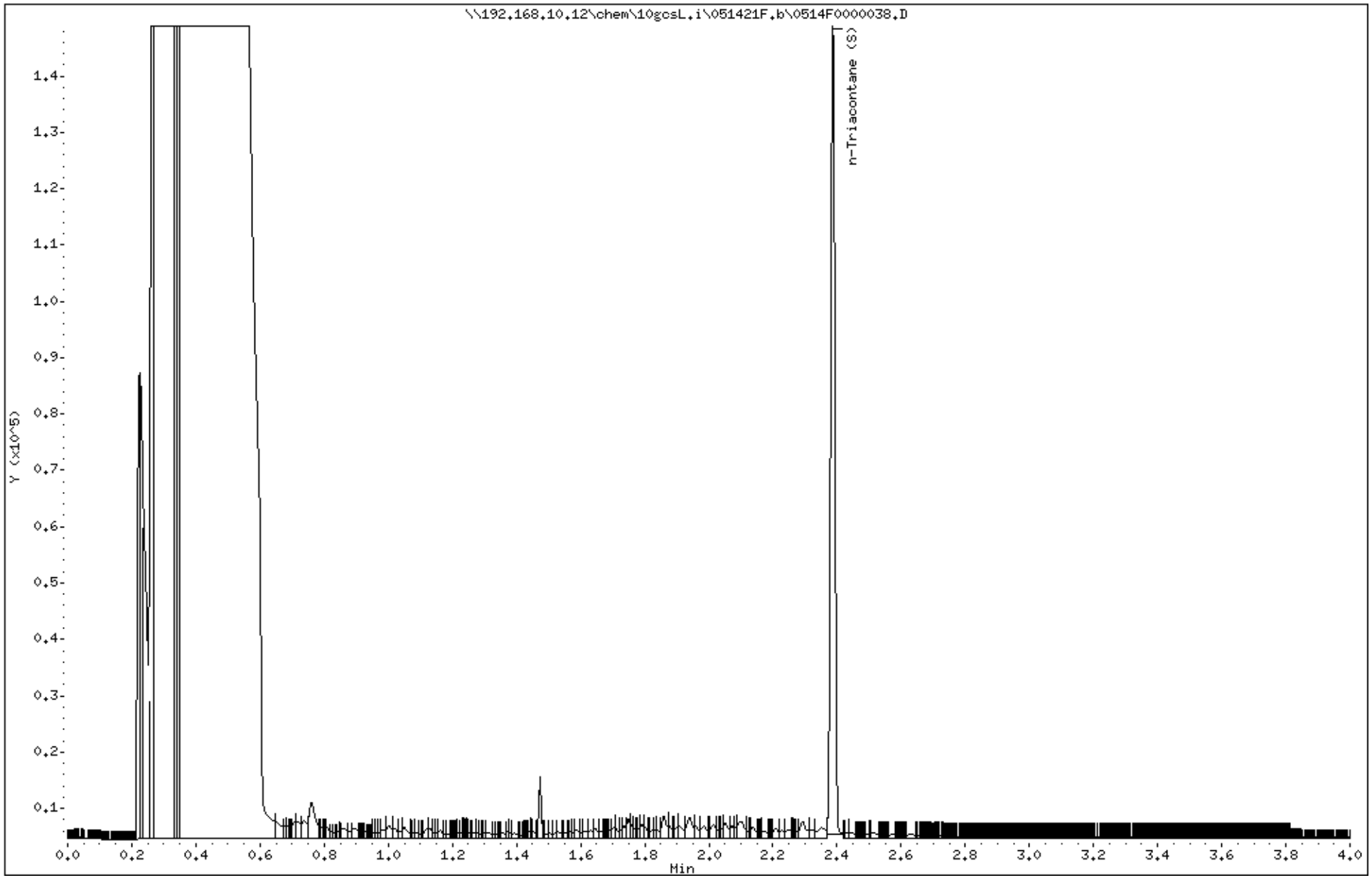
Project Manager Review: Jessica Hunter **Date:** 5/13/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: IJ

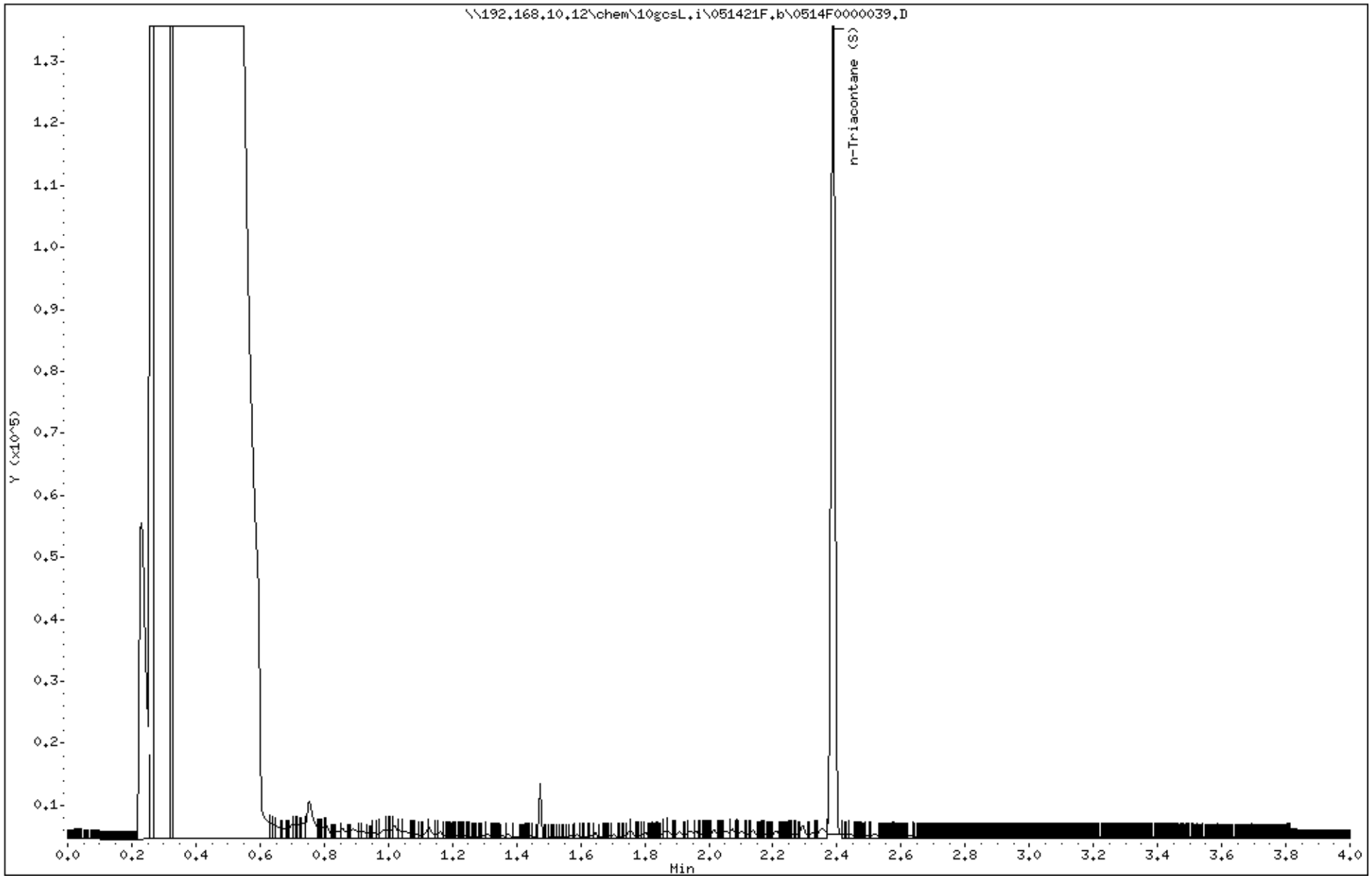
Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000038.D
Date : 14-MAY-2021 14:05
Client ID: SW27-MW06
Sample Info: 10559952001
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



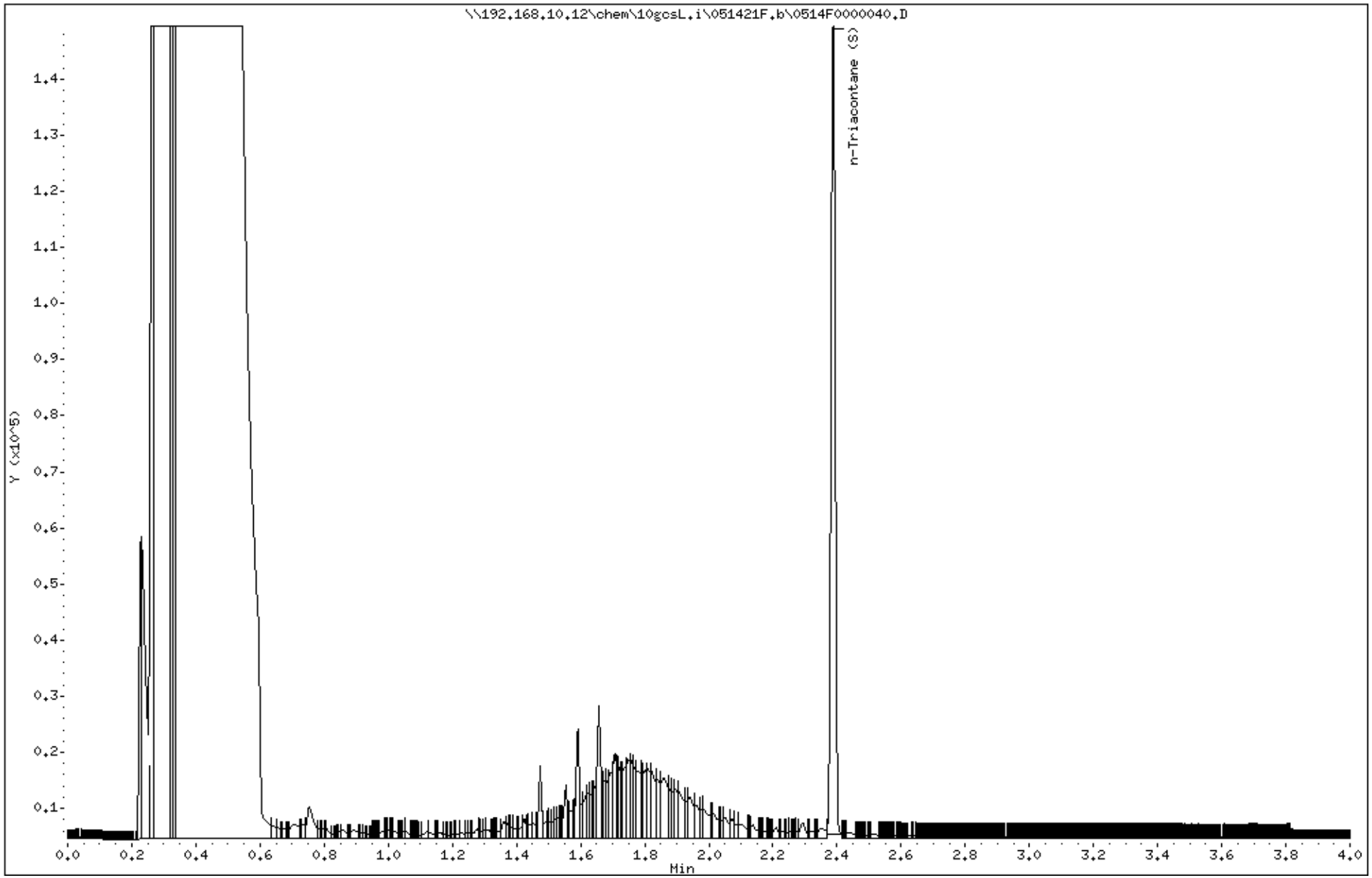
Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000039.D
Date : 14-MAY-2021 14:12
Client ID: SW27-MW07
Sample Info: 10559952002
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



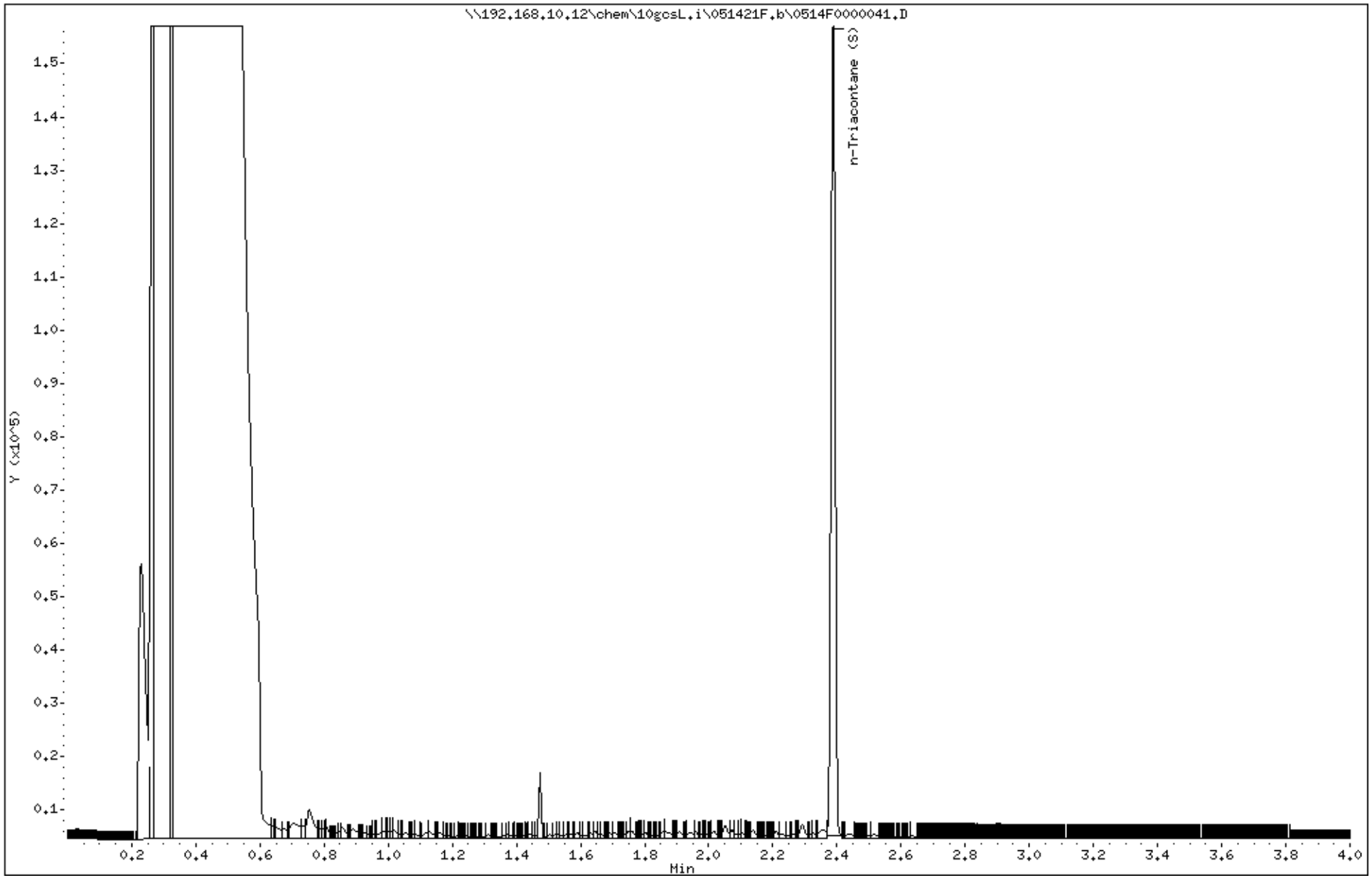
Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000040.D
Date : 14-MAY-2021 14:19
Client ID: SW27-MW08
Sample Info: 10559952003
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcsL.i\051421F.b\0514F0000041.D
Date : 14-MAY-2021 14:26
Client ID: SW27-EB01
Sample Info: 10559952004
Volume Injected (uL): 1.0
Column phase: DB-5-US20500046

Instrument: 10gcsL.i
Operator: JVM
Column diameter: 0.32



Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

June 08, 2021

Erik Nimlos
Bay West LLC
5 Empire Drive
Saint Paul, MN 55103

RE: Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Dear Erik Nimlos:

Enclosed are the analytical results for sample(s) received by the laboratory on May 12, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sylvia Hunter

Sylvia Hunter
sylvia.hunter@pacelabs.com
1(612)607-1700
Project Manager

Enclosures

cc: Ryan Riley, Bay West LLC
Jeff Smith, Pace Analytical Services, Inc
Gerrit Vanderwaal, Bay West

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10559954001	**SW27-MW06**	Water	05/12/21 09:20	05/12/21 16:40
10559954002	**SW27-MW07**	Water	05/12/21 11:55	05/12/21 16:40
10559954003	**SW27-MW08**	Water	05/12/21 15:05	05/12/21 16:40
10559954004	**SW27-EB01**	Water	05/12/21 13:00	05/12/21 16:40

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10559954001	**SW27-MW06**	EPA 900.0	ERT	1	PASI-PA
10559954002	**SW27-MW07**	EPA 900.0	ERT	1	PASI-PA
10559954003	**SW27-MW08**	EPA 900.0	ERT	1	PASI-PA
10559954004	**SW27-EB01**	EPA 900.0	ERT	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Method: **EPA 900.0**
Description: 900.0 Gross Alpha/Beta
Client: Bay West LLC
Date: June 08, 2021

General Information:
4 samples were analyzed for EPA 900.0 by Pace Analytical Services Greensburg. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Sample: SW27-MW06 **Lab ID: 10559954001** Collected: 05/12/21 09:20 Received: 05/12/21 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**9.27 ± 5.43 (8.18) C:NA T:NA**	pCi/L	06/08/21 08:58	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Sample: SW27-MW07 **Lab ID: 10559954002** Collected: 05/12/21 11:55 Received: 05/12/21 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**0.311 ± 1.14 (2.87) C:NA T:NA**	pCi/L	06/08/21 08:59	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Sample: SW27-MW08 **Lab ID: 10559954003** Collected: 05/12/21 15:05 Received: 05/12/21 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**9.10 ± 4.80 (6.08) C:NA T:NA**	pCi/L	06/08/21 08:59	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Sample: SW27-EB01 **Lab ID: 10559954004** Collected: 05/12/21 13:00 Received: 05/12/21 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Gross Alpha	EPA 900.0	**0.026 ± 0.533 (1.48) C:NA T:NA**	pCi/L	06/08/21 08:59	12587-46-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL - RADIOCHEMISTRY

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

QC Batch: 450305
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 10559954001, 10559954002, 10559954003, 10559954004

METHOD BLANK: 2173275 Matrix: Water
Associated Lab Samples: 10559954001, 10559954002, 10559954003, 10559954004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.720 ± 0.443 (1.88) C:NA T:NA	pCi/L	06/08/21 08:58	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 200402 SW#27 Vadnais Heights
Pace Project No.: 10559954

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10559954001	**SW27-MW06**	EPA 900.0	450305		
10559954002	**SW27-MW07**	EPA 900.0	450305		
10559954003	**SW27-MW08**	EPA 900.0	450305		
10559954004	**SW27-EB01**	EPA 900.0	450305		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A (Required Client Information)		Section B (Required Project Information)		Section C (Invoice Information)		Section D (Laboratory Information)		Section E (MPCA Information)	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace	COC ID:	
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414	Work Order Number	3000027125
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter	Facility Code:	SW-27
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286	Project Task Code:	PRJ07913
Phone:	651-291-3493	Copy To:	ryanr@baywest.com					Program Code	
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com						

Matrix Code	Lab Matrix Codes	Field Matrix Codes	Sample Type Codes
SE=Sediment	DW=Drinking Water	Wtr-Ground=Ground Water	Sample=Routine Sample
SO=Soil	NW=Non-potable Water	WTR-Surf=Surface Water	S-CWOP=Composite Sample
QC=Soil QC	SD=Soil/Solid	QC-Blank=Artificial Blank Water	S-IVP=Integrated Vertical Profile Sample
W=Aqueous	WP=Wipe	Leachate=Leachate Sample	QC-FB=Field Blank Sample
WG=Groundwater	AR=Air	Soil-Surf= Soil Surface	QC-FR=Field Replicate Sample
S=Surface	BL=Biological Material	Soil-Sub= Soil Subsurface	QC-TB=Trip Blank Sample
	OT=Other		

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	Preservatives: HNO3	Requested Analysis: Gross Alpha	Comments
1	847409	SW27-MW01	Sample	G	WG	NW	Wtr-Ground					X	Omit
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground					X	"
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground					X	"
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground					X	"
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground					X	"
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	5-12-21	0920	1		X	
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	5-12-21	1155	1		X	
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	5-12-21	1505	1		X	
9	847410	SW27-MW02 - D	QC-FR	G	WG	NW	Wtr-Ground					X	Omit
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	5-12-21	1300	1		X	
11													
12													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
NON-ADMIN	Ted T / Bay West	5-12-21	1640	[illegible] - Pace	05/12/21	1640	4.4 37 N X
							Temp (°C) / Received on Ice (Y/N) / Custody Sealed Cooler (Y/N) / Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE		
PRINT Name of SAMPLER:	Ted Traegel	
SIGNATURE of SAMPLER:	[signature]	DATE Signed (MM/DD/YY): 5-12-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Baywest **Project #:**

WO#: 10559954

PM: SH1 **Due Date: 06/03/21**

CLIENT: BW-BAY WEST

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial

Tracking Number: See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☑Yes ☐No

Thermometer: ☐T1(0461) ☐T2(1336) ☐T3(0459) ☐OS418-LS ☐T4(0254) ☑T5(0489) ☐160285052 **Type of Ice:** ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Did Samples Originate in West Virginia? ☐Yes ☑No **Were All Container Temps Taken?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 4.1,3.5 °C

Correction Factor: 0.0 **Cooler Temp Corrected w/temp blank:** 4.1,3.5 °C

Average Corrected Temp (no temp blank only): ____ °C ☐See Exceptions ENV-FRM-MIN4-0142 ☐1 Container

USDA Regulated Soil: (☑N/A, water sample/Other:_____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☐No

Date/Initials of Person Examining Contents: 5/13/21 JJ

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☐No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑Yes	☐No		1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used?	☑Yes	☐No		8.
-Pace Containers Used?	☑Yes	☐No		
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC?	☑Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ ENV-FRM-MIN4-0142
Matrix: ☑Water ☐Soil ☐Oil ☐Other_____				
All containers needing acid/base preservation have been checked?	☑Yes	☐No	☐N/A	12. Sample # 1-4
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑Yes	☐No	☐N/A	☐NaOH ☑HNO_3 ☑H_2SO_4 ☐Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑Yes	☐No	☐N/A	Positive for Res. Chlorine? ☐Yes ☐No **pH Paper Lot#** **See Exception** ☐ ENV-FRM-MIN4-0142
				Res. Chlorine: 0-6 Roll 221419 / 0-6 Strip / 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐Yes	☐No	☑N/A	13. **See Exception** ☐ ENV-FRM-MIN4-0140
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	
Trip Blank Present?	☐Yes	☐No	☑N/A	14. Pace Trip Blank Lot # (if purchased):
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: Date/Time:

Comments/Resolution: Deborah Hunter

Project Manager Review: **Date:** 5/13/21

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: IF (1)

Internal Transfer Chain of Custody

Pace Analytical®
www.pacelabs.com

☐ Samples Pre-Logged into eCOC.

State Of Origin: MN-ADMIN
Cert. Needed: ☒ Yes ☐ No

Workorder: 10559954 **Workorder Name:** 200402 SW#27 Vadnais Heights

Owner Received Date: 5/12/2021 **Results Requested By:** 6/3/2021

Report To	Subcontract To
Sylvia Hunter Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone 1(612)607-1700	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600

BP2U

WO#: 30421138

30421138

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers HNO3	Gross Alpha	LAB USE ONLY
1	SW27-MW06	PS	5/12/2021 09:20	10559954001	Water	1	X	001
2	SW27-MW07	PS	5/12/2021 11:55	10559954002	Water	1	X	002
3	SW27-MW08	PS	5/12/2021 15:05	10559954003	Water	1	X	003
4	SW27-EB01	PS	5/12/2021 13:00	10559954004	Water	1	X	004
5								

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature] Pace	5/14/21 1430	[signature]	5-15-21 1020
2				
3				

Comments

5-17-21

Cooler Temperature on Receipt N/A °C | **Custody Seal** (Y) or N | **Received on Ice** Y or (N) | **Samples Intact** (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.*
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace MN Project # # 30421138

Label	RM
LIMS Login	RM

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 9371 9292 9731

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used — Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 1001101 / Date and Initials of person examining contents: RM 5-17-21
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. PHL2
All containers meet method preservation requirements.	✓			Initial when completed: RM Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: RM Date: 5-17-21 Survey Meter SN: 1513

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical™

www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR TCDD

Report Information:

Pace Project #: 10559958
Sample Receipt Date: 05/12/2021
Client Project #: 200402 SW#27 Vadnais
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Krista Carlson, your Pace Project Manager.

This report has been reviewed by:

June 01, 2021
Krista Carlson, Project Manager

(612) 607-1700 (fax)
krista.carlson@pacelabs.com

Report Prepared Date:
May 25, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on four samples submitted by a representative of BayWest, LLC. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290A. The estimated detection limits (EDLs) were based on signal-to-noise measurements.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 54-73%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290A. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 101-106% with a relative percent difference of 4.8%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10559958

10559958

001

Report No:.....10559958_8290TCDD_DFR

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Informa	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

COC ID:	
Work Order Numbe	3000027125
Facility Code:	SW-27
Project Task Code:	PRJ07913
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives

HCl	none	none	none	H2SO4								

Requested Analysis

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen							Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground				X	X	X	X	X	~~00~~						omit-TT
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	5-12-21	0920	9	X	X	X	X	X							
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	5-12-21	1155	9	X	X	X	X	X	001						
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	5-12-21	1505	9	X	X	X	X	X	002						
9	847410	SW27-MW02-D	QC-FR	G	WG	NW	Wtr-Ground				X	X	X	X	X	003						omit-TT
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	5-12-21	1300	9	X	X	X	X	X	004						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted T/Bay West	5-12-21	1640	[illegible] Pace	5/12/21	1640

SAMPLE CONDITIONS			
4.1, 3.3	Y	N	Y
Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Toege

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 5-12-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Baywest

Project #:

WO#: 10559958

PM: KAC **Due Date: 05/26/21**

CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☐ OS418-LS ☐ T4(0254) ☑ T5(0489) ☐ 160285052 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 4.1, 3.5 °C

Correction Factor: 0.0 **Cooler Temp Corrected w/temp blank:** 4.1, 3.5 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☑ N/A, water sample/Other: _____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Date/Initials of Person Examining Contents: 5/13/21 IJ

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other _____
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Volume?	☑ Yes	☐ No		7.
Correct Containers Used? -Pace Containers Used?	☑ Yes ☑ Yes	☐ No ☐ No		8.
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC? Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other _____	☑ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	12. Sample # 1-4
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑ Yes	☐ No	☐ N/A	☐ NaOH ☑ HNO_3 1x1 ☑ H_2SO_4 1x1 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑ Yes	☐ No	☐ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine: 0-6 Roll 221419 / 0-6 Strip / 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	14. Pace Trip Blank Lot # (if purchased): _____
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ **Field Data Required?** ☐ Yes ☐ No

Comments/Resolution: _____

Project Manager Review: Kristen Hoffert **Date:** 5/13/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

MKL

Labeled by: EJ (1) RH 5/13/21

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW06		
Lab Sample ID	10559958001		
Filename	Y210520A_06		
Injected By	SM		
Total Amount Extracted	990 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/12/2021 09:20
ICAL ID	Y210504	Received	05/12/2021 16:40
CCal Filename(s)	Y210520A_01 & Y210520A_16	Extracted	05/17/2021 12:30
Method Blank ID	BLANK-90085	Analyzed	05/20/2021 20:01

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.973	2,3,7,8-TCDD-13C	2.00	54
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	79

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW07		
Lab Sample ID	10559958002		
Filename	Y210520A_07		
Injected By	SM		
Total Amount Extracted	990 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/12/2021 11:55
ICAL ID	Y210504	Received	05/12/2021 16:40
CCal Filename(s)	Y210520A_01 & Y210520A_16	Extracted	05/17/2021 12:30
Method Blank ID	BLANK-90085	Analyzed	05/20/2021 20:45

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.777	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-MW08		
Lab Sample ID	10559958003		
Filename	Y210520A_08		
Injected By	SM		
Total Amount Extracted	973 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/12/2021 15:05
ICAL ID	Y210504	Received	05/12/2021 16:40
CCal Filename(s)	Y210520A_01 & Y210520A_16	Extracted	05/17/2021 12:30
Method Blank ID	BLANK-90085	Analyzed	05/20/2021 21:30

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	1.27	2,3,7,8-TCDD-13C	2.00	68
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	89

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Sample Analysis Results

Client - Bay West, LLC

Client's Sample ID	SW27-EB01		
Lab Sample ID	10559958004		
Filename	Y210520A_09		
Injected By	SM		
Total Amount Extracted	997 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/12/2021 13:00
ICAL ID	Y210504	Received	05/12/2021 16:40
CCal Filename(s)	Y210520A_01 & Y210520A_16	Extracted	05/17/2021 12:30
Method Blank ID	BLANK-90085	Analyzed	05/20/2021 22:14

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	0.911	2,3,7,8-TCDD-13C	2.00	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	85

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

ND = Not Detected
NA = Not Applicable
NC = Not Calculated

R = Recovery outside target range
E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Blank Analysis Results

Lab Sample Name	DFBLKCJ		
Lab Sample ID	BLANK-90085	Matrix	Water
Filename	F210520B_07	Dilution	NA
Total Amount Extracted	991 mL	Extracted	05/17/2021 12:30
ICAL ID	F210425	Analyzed	05/21/2021 01:29
CCal Filename(s)	F210520A_20 & F210520B_16	Injected By	SMT

Native Isomers	**Conc** pg/L	**EMPC** pg/L	**EDL** pg/L	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	ND	-----	4.17	2,3,7,8-TCDD-13C	2.00	74
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	83

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
EDL = Estimated Detection Limit

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCS-90086		
Filename	F210520B_02	Matrix	Water
Total Amount Extracted	1010 mL	Dilution	NA
ICAL ID	F210425	Extracted	05/17/2021 12:30
CCal Filename(s)	F210520A_20 & F210520B_16	Analyzed	05/20/2021 21:34
Method Blank ID	BLANK-90085	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.21	106	2,3,7,8-TCDD-13C	2.0	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	80

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A Laboratory Control Spike Results

Lab Sample ID	LCSD-90087		
Filename	F210520B_03	Matrix	Water
Total Amount Extracted	1030 mL	Dilution	NA
ICAL ID	F210425	Extracted	05/17/2021 12:30
CCal Filename(s)	F210520A_20 & F210520B_16	Analyzed	05/20/2021 22:21
Method Blank ID	BLANK-90085	Injected By	SMT

Native Isomers	**Qs** (ng)	**Qm** (ng)	% Rec.	**Internal Standards**	**ng's Added**	**Percent Recovery**
2,3,7,8-TCDD	0.20	0.20	101	2,3,7,8-TCDD-13C	2.0	71
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 8290A

Spike Recovery Relative Percent Difference (RPD) Results

Client	Bay West, LLC		
Spike 1 ID	LCS-90086	Spike 2 ID	LCSD-90087
Spike 1 Filename	F210520B_02	Spike 2 Filename	F210520B_03

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	106	101	4.8

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, LLC.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Erik Nimlos
Bay West, LLC
5 Empire Drive
Saint Paul MN 55103

REPORT OF LABORATORY ANALYSIS FOR PFAAs

Report Information:

Pace Project #: 10559958
Sample Receipt Date: 05/12/2021
Client Project #: 200402 SW#27 Vadnais Heights
Client Sub PO #: 205946
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Krista Carlson, your Pace Project Manager.

This report has been reviewed by:

June 01, 2021
Krista Carlson, Project Manager

(612) 607-1700 (fax)
krista.carlson@pacelabs.com

Report Prepared Date:
May 28, 2021

Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

DISCUSSION

This report presents the results from the analysis performed on four samples submitted by a representative of Bay West LLC. The samples were analyzed for thirty-three perfluorinated compounds using MPCA Guidance. Reporting limits were set to the quantitation limits.

A laboratory method blank was prepared and analyzed with each sample batch as part of our routine quality control procedures. The results show the blanks to be free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

Laboratory spike sample was also prepared with the sample batch using clean reference matrix that had been fortified with native standards. The recovery results were within the method limits. This spike indicates that extraction performed as expected. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from that analysis will be provided upon request.

Diminished extracted internal standard (EIS) recovery (outside the suggested limits) were present in the sample material, however, the use of the isotope dilution method generally precludes any adverse impact on those individual native compounds that have a directly associated standard.

The four injection internal standards (13C4_PFOA, 13C4_PFOS, 13C2_PFDA, and 13C2_PFHxA) pass for each analysis in the batch verifying that the instrument detector is working as expected.

Values were flagged "I" where incorrect isotope ratios were obtained.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
		Missouri	10100
A2LA	2926.01	Montana	CERT0092
Alabama	40770	Nebraska	NE-OS-18-06
Alaska-DW	MN00064	Nevada	MN00064
Alaska-UST	17-009	New Hampshire	2081
Arizona	AZ0014	New Jersey	MN002
Arkansas - WW	88-0680	New York	11647
Arkansas-DW	MN00064	North Carolina-	27700
California	2929	North Carolina-	530
Colorado	MN00064	North Dakota	R-036
Connecticut	PH-0256	Ohio-DW	41244
Florida	E87605	Ohio-VAP (170	CL101
Georgia	959	Ohio-VAP (180	CL110
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon- rimary	MN300001
Illinois	200011	Oregon-Second	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky-DW	90062	Tennessee	TN02818
Kentucky-WW	90062	Texas	T104704192
Louisiana-DEQ	AI-84596	Utah	MN00064
Louisiana-DW	MN00064	Vermont	VT-027053137
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Michigan	9909	West Virginia-D	382
Minnesota	027-053-137	West Virginia-D	9952C
Minnesota-Ag	via MN 027-053	Wisconsin	999407970
Minnesota-Petr	1240	Wyoming-UST	via A2LA 2926.
Mississippi	MN00064		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix A

Sample Management

CHAIN-OF-CUSTODY / Analytical Request Document

Bay West — Customer-Focused Environmental & Industrial Solutions

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

WO# : 10559958

10559958

001

Report No:.....10559958_D36_DFR

Section A — Required Client Information:		Section B — Required Project Information:		Section C — Invoice Information:		Section D — Laboratory Informa	
Company:	Bay West	Project Name:	SW#27 Vadnais Heights Demo Landfill	Attention:	Accounts Payable	Lab Name:	Pace
Address:	5 Empire Dr. St.Paul MN, 55103	Project Number:	200402	Company Name:	Bay West LLC	Adress:	1700 Elm St. Minneapolis MN, 55414
Project Manager :	Erik Nimlos	Turnaround Time:	Standard	Address:	5 Empire Dr. St. Paul, MN 55103	Lab Project Manager	Sylvia Hunter
Email To:	enimlos@baywest.com	Site Location (State):	MN	Purchase Order No.	205946	Lab Phone:	612-656-2286
Phone:	651-291-3493	Copy To:	ryanr@baywest.com				
Copy To:	Eweaver@baywest.com	Copy To:	gvanderwaal@baywest.com				

COC ID:	
Work Order Numbe	3000027125
Facility Code:	SW-27
Project Task Code:	PRJ07913
Program Code	

Matrix Code: SE=Sediment; SO=Soil; QC=Soil QC; W=Aqueous; WG=Groundwater; S=Surface

Lab Matrix Codes: DW=Drinking Water; NW=Non-potable Water; SD=Soil/Solid; WP=Wipe; AR=Air; BL=Biological Material; OT=Other

Field Matrix Codes: Wtr-Ground=Ground Water; WTR-Surf=Surface Water; QC-Blank=Artificial Blank Water; Leachate=Leachate Sample; Soil-Surf= Soil Surface; Soil-Sub= Soil Subsurface

Sample Type Codes: Sample=Routine Sample; S-CWOP=Composite Sample; S-IVP=Integrated Vertical Profile Sample; QC-FB=Field Blank Sample; QC-FR=Field Replicate Sample; QC-TB=Trip Blank Sample

Preservatives

HCl	none	none	none	H2SO4								

Requested Analysis

ITEM #	Location Unique ID	Sample Common ID	Sample Type Code (MPCA ONLY)	SAMPLE TYPE (G=GRAB C=COMP)	Matrix Code	Lab Matrix Code (MPCA ONLY)	Field Matrix Code (MPCA ONLY)	Date	Time	# of Cont.	DRO with silica gel cleanup (WI DRO)	2,3,7,8 TCD (Dioxin) - (EPA 8290A)	1,4-Dioxane (Analyzed as a single compound) - (8270 SIM)	PFAS	Nitrate + Nitrite, as Nitrogen							Comments
1	847409	SW27-MW01	Sample	G	wg	nw	Wtr-Ground				X	X	X	X	X	~~00~~						omit-TT
2	847410	SW27-MW02	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
3	847406	SW27-MW03	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
4	847411	SW27-MW04	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
5	854777	SW27-MW05	Sample	G	WG	NW	Wtr-Ground				X	X	X	X	X							"
6	854580	SW27-MW06	Sample	G	WG	NW	Wtr-Ground	5-12-21	0920	9	X	X	X	X	X							
7	854578	SW27-MW07	Sample	G	WG	NW	Wtr-Ground	5-12-21	1155	9	X	X	X	X	X	001						
8	854579	SW27-MW08	Sample	G	WG	NW	Wtr-Ground	5-12-21	1505	9	X	X	X	X	X	002						
9	847410	SW27-MW02-D	QC-FR	G	WG	NW	Wtr-Ground				X	X	X	X	X	003						omit-TT
10	Equipment Blank	SW27-EB01	QC-EB	G	WG	NW	Wtr-Ground	5-12-21	1300	9	X	X	X	X	X	004						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted T/Bay West	5-12-21	1640	[illegible] Pace	5/12/21	1640

SAMPLE CONDITIONS

Temp (°C)	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
4.1, 3.3	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ted Toege

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 5-12-21

Pace Analytical®	Document Name: **Sample Condition Upon Receipt (SCUR) - MN**	Document Revised: 14Apr2021 **Page 1 of 1**
	Document No.: **ENV-FRM-MIN4-0150 Rev.02**	Pace Analytical Services - **Minneapolis**

Sample Condition Upon Receipt

Client Name: Baywest

Project #:

WO#: 10559958

PM: KAC **Due Date: 05/26/21**

CLIENT: BW-BAY WEST

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: _____ See Exceptions ☐ ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: _____ **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1(0461) ☐ T2(1336) ☐ T3(0459) ☐ OS418-LS ☐ T4(0254) ☑ T5(0489) ☐ 160285052 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 4.1, 3.5 °C

Correction Factor: 0.0 **Cooler Temp Corrected w/temp blank:** 4.1, 3.5 °C

Average Corrected Temp (no temp blank only): _____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☑ N/A, water sample/Other: _____)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Date/Initials of Person Examining Contents: 5/13/21 IJ

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E coli ☐ BOD/cBOD ☐ Hex Chrome ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Volume?	☑ Yes	☐ No		7.
Correct Containers Used?	☑ Yes	☐ No		8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. **If no, write ID/ Date/Time on Container Below:** **See Exception** ☐ **ENV-FRM-MIN4-0142**
Matrix: ☑ Water ☐ Soil ☐ Oil ☐ Other _____				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	12. Sample # 1-4
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☑ Yes	☐ No	☐ N/A	☐ NaOH ☑ HNO_3 (1x1) ☑ H_2SO_4 (1x1) ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☑ Yes	☐ No	☐ N/A	Positive for Res. Chlorine? ☐ Yes ☐ No **pH Paper Lot#** **See Exception** ☐ **ENV-FRM-MIN4-0142**
				Res. Chlorine: 0-6 Roll 221419 / 0-6 Strip / 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. **See Exception** ☐ **ENV-FRM-MIN4-0140**
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ **Field Data Required?** ☐ Yes ☐ No

Comments/Resolution: _____

Project Manager Review: Kristen Hoffert **Date:** 5/13/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

MKR

Labeled by: EJ (1) RH 5/13/21

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise (EDL)

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interferencepresent

J = Estimated value

L = Suppressive interference, analyte may be biased low

Nn = Value obtained from additional analysis

P = PCDEInterference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = SeeDiscussion

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Appendix B

Sample Analysis Summary

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958001	Total Amount Extracted	247mL
Lab File ID	A210525D_008	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 09:20	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	120	1.01	1.01	0.303	1	375-22-4	
PFPeA	14.7	1.01	1.01	0.200	1	2706-90-3	
HFPO-DA	ND	1.01	1.01	0.190	1	13252-13-6	
PFBS	2.55	0.894	0.894	0.206	1	375-73-5	
PFHxA	9.12	1.01	1.01	0.226	1	307-24-4	
4:2 FTS	ND	0.945	0.945	0.301	1	757124-72-4	
PFPeS	ND	0.950	0.950	0.236	1	2706-91-4	
PFHpA	3.45	1.01	1.01	0.279	1	375-85-9	
DONA	ND	0.955	0.955	0.242	1	919005-14-4	
PFHxS	ND	0.919	0.919	0.157	1	355-46-4	
PFOA	7.10	1.01	1.01	0.180	1	335-67-1	
6:2 FTS	ND	0.960	0.960	0.315	1	27619-97-2	
PFHpS	ND	0.960	0.960	0.238	1	375-92-8	
PFNA	ND	1.01	1.01	0.183	1	375-95-1	
PFOSAm	ND	1.01	1.01	0.218	1	754-91-6	
PFOS	1.00 I	0.934	0.934	0.183	1	1763-23-1	
MeFOSA	ND	1.01	1.01	0.325	1	31506-32-8	
PFDA	ND	1.01	1.01	0.242	1	335-76-2	
EtFOSAm	ND	1.01	1.01	0.305	1	4151-50-2	
8:2 FTS	ND	0.970	0.970	0.315	1	39108-34-4	
9-Cl-PF3ON	ND	0.942	0.942	0.277	1	756426-58-1	
PFNS	ND	0.970	0.970	0.218	1	68259-12-1	
PFUnDA	ND	1.01	1.01	0.335	1	2058-94-8	
NMeFOSAA	ND	1.01	1.01	0.291	1	2355-31-9	
NEtFOSAA	ND	1.01	1.01	0.271	1	2991-50-6	
PFDS	ND	0.975	0.975	0.234	1	335-77-3	
PFDOA	ND	1.01	1.01	0.327	1	307-55-1	
MeFOSE	ND	1.01	1.01	0.218	1	24448-09-7	
EtFOSE	ND	1.01	1.01	0.277	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.952	0.952	0.244	1	763051-92-9	
PFTrDA	ND	1.01	1.01	0.329	1	72629-94-8	
PFDoS	ND	0.978	0.978	0.255	1	79780-39-5	
PFTDA	ND	1.01	1.01	0.167	1	376-06-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958001	Total Amount Extracted	247mL
Lab File ID	A210525D_008	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 09:20	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	20.2	21.2	105	50-200	
13C4_PFOA	20.2	23.9	118	50-200	
13C2_PFDA	20.2	24.1	119	50-200	
13C4_PFOS	19.3	22.2	115	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	20.2	14.4	71	50-200	
13C5_PFPeA	20.2	18.0	89	50-200	
13C3_PFBS	18.8	19.3	103	50-200	
13C2_4:2FTS	18.9	32.6	172	50-200	
13C5_PFHxA	20.2	22.8	113	50-200	
13C4_PFHpA	20.2	23.6	117	50-200	
13C3_PFHxS	19.1	21.9	115	50-200	
13C2_6:2FTS	19.2	32.3	168	50-200	
13C8_PFOA	20.2	23.1	114	50-200	
13C9_PFNA	20.2	23.9	118	50-200	
13C8_PFOS	19.3	22.1	114	50-200	
13C2_8:2FTS	19.4	29.1	150	50-200	
13C6_PFDA	20.2	26.3	130	50-200	
d3-MeFOSAA	20.2	36.8	182	50-200	
13C8_PFOSA	20.2	18.2	90	50-200	
d5-EtFOSAA	20.2	32.6	161	50-200	
13C7_PFUdA	20.2	29.4	146	50-200	
13C2_PFDoA	20.2	30.0	148	50-200	
13C2_PFTeDA	20.2	22.2	110	50-200	
13C3_HFPO-DA	20.2	20.9	103	50-200	
13C2_PFHxDA	20.2	21.8	108	50-200	
d7-N-MeFOSE	20.2	17.3	86	50-200	
d9-N-EtFOSE	20.2	17.8	88	50-200	
d3-N-MeFOSA	20.2	12.6	62	50-200	
d5-N-EtFOSA	20.2	12.5	62	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958001	Total Amount Extracted	247mL
Lab File ID	A210525D_008	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 09:20	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFOA	N/A	N/A	6.02	6.03	
13C2_PFDA	N/A	N/A	6.92	6.93	
13C4_PFOS	N/A	N/A	7.26	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.58	3.60	
13C5_PFPeA	N/A	N/A	4.44	4.45	
13C3_PFBS	N/A	N/A	5.24	5.25	
13C2_4:2FTS	N/A	N/A	4.82	4.83	
13C5_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.33	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.02	6.03	
13C9_PFNA	N/A	N/A	6.47	6.49	
13C8_PFOS	N/A	N/A	7.26	7.29	
13C2_8:2FTS	N/A	N/A	6.67	6.68	
13C6_PFDA	N/A	N/A	6.92	6.94	
d3-MeFOSAA	N/A	N/A	6.85	6.87	
13C8_PFOSA	N/A	N/A	8.83	8.84	
d5-EtFOSAA	N/A	N/A	7.07	7.08	
13C7_PFUdA	N/A	N/A	7.37	7.38	
13C2_PFDoA	N/A	N/A	7.82	7.84	
13C2_PFTeDA	N/A	N/A	8.70	8.71	
13C3_HFPO-DA	N/A	N/A	5.25	5.26	
13C2_PFHxDA	N/A	N/A	9.48	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.71	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW06	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958001	Total Amount Extracted	247mL
Lab File ID	A210525D_008	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 09:20	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.59	3.60	
PFPeA	N/A	N/A	4.44	4.45	
HFPO-DA	0.420	0.450	5.27	5.28	
PFBS	0.330	0.330	5.25	5.26	
PFHxA	0.065	0.0660	5.05	5.06	
4:2 FTS	0.000	0.560	4.81	4.83	
PFPeS	0.320	0.320	5.83	5.83	
PFHpA	0.280	0.280	5.56	5.57	
DONA	0.000	0.490	5.74	5.75	
PFHxS	0.420	0.260	6.34	6.35	
PFOA	0.390	0.350	6.03	6.04	
6:2 FTS	0.360	0.530	5.79	5.80	
PFHpS	0.200	0.230	6.81	6.83	
PFNA	0.210	0.190	6.48	6.49	
PFOSAm	N/A	N/A	8.83	8.84	
PFOS	0.100	0.230	7.12	7.29	I
MeFOSA	0.750	0.870	10.36	10.37	
PFDA	0.063	0.0890	6.93	6.94	
EtFOSAm	0.910	0.710	11.08	11.07	
8:2 FTS	0.000	0.700	0.00	6.69	
9-Cl-PF3ON	0.000	0.0210	0.00	7.61	
PFNS	0.000	0.240	0.00	7.75	
PFUnDA	0.100	0.0930	7.38	7.39	
NMeFOSAA	0.560	0.590	6.85	6.88	
NEtFOSAA	0.000	0.660	0.00	7.09	
PFDS	0.240	0.240	8.19	8.19	
PFDOA	0.200	0.140	7.82	7.84	
MeFOSE	N/A	N/A	10.12	10.13	
EtFOSE	0.000	0.000	10.75	10.77	
11-Cl-PF3OUdS	0.000	0.0140	8.50	8.49	
PFTrDA	0.000	0.150	8.28	8.28	
PFDoS	0.000	0.230	0.00	9.00	
PFTDA	0.085	0.140	8.70	8.71	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958002	Total Amount Extracted	490mL
Lab File ID	A210525D_009	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 11:55	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	14.7	0.510	0.510	0.153	1	375-22-4	
PFPeA	4.19	0.510	0.510	0.101	1	2706-90-3	
HFPO-DA	ND	0.510	0.510	0.095	1	13252-13-6	
PFBS	3.43	0.451	0.451	0.104	1	375-73-5	
PFHxA	4.32	0.510	0.510	0.114	1	307-24-4	
4:2 FTS	ND	0.477	0.477	0.152	1	757124-72-4	
PFPeS	2.45	0.480	0.480	0.119	1	2706-91-4	
PFHpA	1.65	0.510	0.510	0.141	1	375-85-9	
DONA	ND	0.482	0.482	0.122	1	919005-14-4	
PFHxS	28.2	0.464	0.464	0.079	1	355-46-4	
PFOA	5.84	0.510	0.510	0.091	1	335-67-1	
6:2 FTS	ND	0.485	0.485	0.159	1	27619-97-2	
PFHpS	1.13	0.485	0.485	0.120	1	375-92-8	
PFNA	ND	0.510	0.510	0.092	1	375-95-1	
PFOSAm	ND	0.510	0.510	0.110	1	754-91-6	
PFOS	73.9	0.472	0.472	0.092	1	1763-23-1	
MeFOSA	ND	0.510	0.510	0.164	1	31506-32-8	
PFDA	ND	0.510	0.510	0.122	1	335-76-2	
EtFOSAm	ND	0.510	0.510	0.154	1	4151-50-2	
8:2 FTS	ND	0.490	0.490	0.159	1	39108-34-4	
9-Cl-PF3ON	ND	0.475	0.475	0.140	1	756426-58-1	
PFNS	ND	0.490	0.490	0.110	1	68259-12-1	
PFUnDA	ND	0.510	0.510	0.169	1	2058-94-8	
NMeFOSAA	ND	0.510	0.510	0.147	1	2355-31-9	
NEtFOSAA	ND	0.510	0.510	0.137	1	2991-50-6	
PFDS	ND	0.492	0.492	0.118	1	335-77-3	
PFDOA	ND	0.510	0.510	0.165	1	307-55-1	
MeFOSE	ND	0.510	0.510	0.110	1	24448-09-7	
EtFOSE	ND	0.510	0.510	0.140	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.481	0.481	0.123	1	763051-92-9	
PFTrDA	ND	0.510	0.510	0.166	1	72629-94-8	
PFDoS	ND	0.494	0.494	0.129	1	79780-39-5	
PFTDA	ND	0.510	0.510	0.084	1	376-06-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958002	Total Amount Extracted	490mL
Lab File ID	A210525D_009	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 11:55	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.2	12.3	120	50-200	
13C4_PFOA	10.2	12.1	118	50-200	
13C2_PFDA	10.2	12.3	121	50-200	
13C4_PFOS	9.76	11.5	117	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.2	12.1	118	50-200	
13C5_PFPeA	10.2	12.4	122	50-200	
13C3_PFBS	9.48	10.5	111	50-200	
13C2_4:2FTS	9.54	13.9	145	50-200	
13C5_PFHxA	10.2	12.4	121	50-200	
13C4_PFHpA	10.2	12.4	122	50-200	
13C3_PFHxS	9.65	12.0	124	50-200	
13C2_6:2FTS	9.68	14.0	144	50-200	
13C8_PFOA	10.2	12.3	120	50-200	
13C9_PFNA	10.2	12.6	124	50-200	
13C8_PFOS	9.76	11.9	122	50-200	
13C2_8:2FTS	9.77	14.0	143	50-200	
13C6_PFDA	10.2	12.7	124	50-200	
d3-MeFOSAA	10.2	17.3	170	50-200	
13C8_PFOSA	10.2	9.85	97	50-200	
d5-EtFOSAA	10.2	14.1	138	50-200	
13C7_PFUdA	10.2	15.2	149	50-200	
13C2_PFDoA	10.2	15.1	148	50-200	
13C2_PFTeDA	10.2	11.2	110	50-200	
13C3_HFPO-DA	10.2	12.4	122	50-200	
13C2_PFHxDA	10.2	11.3	110	50-200	
d7-N-MeFOSE	10.2	8.62	84	50-200	
d9-N-EtFOSE	10.2	9.10	89	50-200	
d3-N-MeFOSA	10.2	5.36	53	50-200	
d5-N-EtFOSA	10.2	5.52	54	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958002	Total Amount Extracted	490mL
Lab File ID	A210525D_009	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 11:55	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFOA	N/A	N/A	6.02	6.03	
13C2_PFDA	N/A	N/A	6.92	6.93	
13C4_PFOS	N/A	N/A	7.27	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.59	3.60	
13C5_PFPeA	N/A	N/A	4.44	4.45	
13C3_PFBS	N/A	N/A	5.24	5.25	
13C2_4:2FTS	N/A	N/A	4.82	4.83	
13C5_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.33	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.02	6.03	
13C9_PFNA	N/A	N/A	6.47	6.49	
13C8_PFOS	N/A	N/A	7.27	7.29	
13C2_8:2FTS	N/A	N/A	6.66	6.68	
13C6_PFDA	N/A	N/A	6.92	6.94	
d3-MeFOSAA	N/A	N/A	6.85	6.87	
13C8_PFOSA	N/A	N/A	8.83	8.84	
d5-EtFOSAA	N/A	N/A	7.06	7.08	
13C7_PFUdA	N/A	N/A	7.37	7.38	
13C2_PFDoA	N/A	N/A	7.82	7.84	
13C2_PFTeDA	N/A	N/A	8.69	8.71	
13C3_HFPO-DA	N/A	N/A	5.25	5.26	
13C2_PFHxDA	N/A	N/A	9.48	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.71	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW07	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958002	Total Amount Extracted	490mL
Lab File ID	A210525D_009	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 11:55	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.44	4.45	
HFPO-DA	0.630	0.450	5.26	5.28	
PFBS	0.310	0.330	5.25	5.26	
PFHxA	0.064	0.0660	5.05	5.06	
4:2 FTS	0.730	0.560	4.81	4.83	
PFPeS	0.320	0.320	5.83	5.83	
PFHpA	0.290	0.280	5.56	5.57	
DONA	0.000	0.490	5.74	5.75	
PFHxS	0.240	0.260	6.33	6.35	
PFOA	0.390	0.350	6.03	6.04	
6:2 FTS	0.260	0.530	5.79	5.80	
PFHpS	0.230	0.230	6.81	6.83	
PFNA	0.190	0.190	6.48	6.49	
PFOSAm	N/A	N/A	8.83	8.84	
PFOS	0.220	0.230	7.27	7.29	
MeFOSA	0.830	0.870	10.36	10.37	
PFDA	0.053	0.0890	6.94	6.94	
EtFOSAm	0.000	0.710	0.00	11.07	
8:2 FTS	0.000	0.700	0.00	6.69	
9-Cl-PF3ON	0.000	0.0210	0.00	7.61	
PFNS	0.000	0.240	0.00	7.75	
PFUnDA	0.000	0.0930	7.37	7.39	
NMeFOSAA	0.000	0.590	0.00	6.88	
NEtFOSAA	0.000	0.660	0.00	7.09	
PFDS	0.260	0.240	8.18	8.19	
PFDOA	0.140	0.140	7.83	7.84	
MeFOSE	N/A	N/A	10.12	10.13	
EtFOSE	0.000	0.000	10.78	10.77	
11-Cl-PF3OUdS	0.000	0.0140	8.59	8.49	
PFTrDA	0.000	0.150	8.27	8.28	
PFDoS	0.000	0.230	0.00	9.00	
PFTDA	0.110	0.140	8.70	8.71	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958003	Total Amount Extracted	249mL
Lab File ID	A210525D_010	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 15:05	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	97.8	1.00	1.00	0.301	1	375-22-4	
PFPeA	8.66	1.00	1.00	0.198	1	2706-90-3	
HFPO-DA	ND	1.00	1.00	0.188	1	13252-13-6	
PFBS	2.37	0.888	0.888	0.205	1	375-73-5	
PFHxA	7.31	1.00	1.00	0.225	1	307-24-4	
4:2 FTS	ND	0.938	0.938	0.299	1	757124-72-4	
PFPeS	1.08	0.943	0.943	0.235	1	2706-91-4	
PFHpA	3.26	1.00	1.00	0.277	1	375-85-9	
DONA	ND	0.948	0.948	0.241	1	919005-14-4	
PFHxS	3.82	0.913	0.913	0.156	1	355-46-4	
PFOA	72.3	1.00	1.00	0.179	1	335-67-1	
6:2 FTS	ND	0.953	0.953	0.313	1	27619-97-2	
PFHpS	ND	0.953	0.953	0.237	1	375-92-8	
PFNA	ND	1.00	1.00	0.182	1	375-95-1	
PFOSAm	ND	1.00	1.00	0.217	1	754-91-6	
PFOS	7.05	0.928	0.928	0.182	1	1763-23-1	
MeFOSA	ND	1.00	1.00	0.323	1	31506-32-8	
PFDA	ND	1.00	1.00	0.241	1	335-76-2	
EtFOSAm	ND	1.00	1.00	0.303	1	4151-50-2	
8:2 FTS	ND	0.963	0.963	0.313	1	39108-34-4	
9-Cl-PF3ON	ND	0.935	0.935	0.275	1	756426-58-1	
PFNS	ND	0.963	0.963	0.217	1	68259-12-1	
PFUnDA	ND	1.00	1.00	0.333	1	2058-94-8	
NMeFOSAA	ND	1.00	1.00	0.289	1	2355-31-9	
NEtFOSAA	ND	1.00	1.00	0.269	1	2991-50-6	
PFDS	ND	0.968	0.968	0.233	1	335-77-3	
PFDOA	ND	1.00	1.00	0.325	1	307-55-1	
MeFOSE	ND	1.00	1.00	0.217	1	24448-09-7	
EtFOSE	ND	1.00	1.00	0.275	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.945	0.945	0.243	1	763051-92-9	
PFTrDA	ND	1.00	1.00	0.327	1	72629-94-8	
PFDoS	ND	0.971	0.971	0.253	1	79780-39-5	
PFTDA	ND	1.00	1.00	0.166	1	376-06-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958003	Total Amount Extracted	249mL
Lab File ID	A210525D_010	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 15:05	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	20.1	23.6	118	50-200	
13C4_PFOA	20.1	24.1	120	50-200	
13C2_PFDA	20.1	23.8	119	50-200	
13C4_PFOS	19.2	22.9	119	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	20.1	16.7	83	50-200	
13C5_PFPeA	20.1	18.4	92	50-200	
13C3_PFBS	18.6	18.1	97	50-200	
13C2_4:2FTS	18.8	30.1	160	50-200	
13C5_PFHxA	20.1	20.4	102	50-200	
13C4_PFHpA	20.1	19.6	98	50-200	
13C3_PFHxS	19.0	18.4	97	50-200	
13C2_6:2FTS	19.0	24.5	129	50-200	
13C8_PFOA	20.1	19.1	95	50-200	
13C9_PFNA	20.1	19.8	99	50-200	
13C8_PFOS	19.2	19.5	102	50-200	
13C2_8:2FTS	19.2	22.3	116	50-200	
13C6_PFDA	20.1	23.4	117	50-200	
d3-MeFOSAA	20.1	31.1	155	50-200	
13C8_PFOSA	20.1	14.8	74	50-200	
d5-EtFOSAA	20.1	24.9	124	50-200	
13C7_PFUdA	20.1	24.7	123	50-200	
13C2_PFDoA	20.1	24.1	120	50-200	
13C2_PFTeDA	20.1	19.1	95	50-200	
13C3_HFPO-DA	20.1	20.3	101	50-200	
13C2_PFHxDA	20.1	19.7	98	50-200	
d7-N-MeFOSE	20.1	14.2	71	50-200	
d9-N-EtFOSE	20.1	14.2	71	50-200	
d3-N-MeFOSA	20.1	8.52	**42**	50-200	R
d5-N-EtFOSA	20.1	8.68	**43**	50-200	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958003	Total Amount Extracted	249mL
Lab File ID	A210525D_010	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 15:05	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFOA	N/A	N/A	6.03	6.03	
13C2_PFDA	N/A	N/A	6.93	6.93	
13C4_PFOS	N/A	N/A	7.27	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.59	3.60	
13C5_PFPeA	N/A	N/A	4.44	4.45	
13C3_PFBS	N/A	N/A	5.25	5.25	
13C2_4:2FTS	N/A	N/A	4.83	4.83	
13C5_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.34	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.03	6.03	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.28	7.29	
13C2_8:2FTS	N/A	N/A	6.67	6.68	
13C6_PFDA	N/A	N/A	6.93	6.94	
d3-MeFOSAA	N/A	N/A	6.86	6.87	
13C8_PFOSA	N/A	N/A	8.84	8.84	
d5-EtFOSAA	N/A	N/A	7.07	7.08	
13C7_PFUdA	N/A	N/A	7.38	7.38	
13C2_PFDoA	N/A	N/A	7.83	7.84	
13C2_PFTeDA	N/A	N/A	8.70	8.71	
13C3_HFPO-DA	N/A	N/A	5.26	5.26	
13C2_PFHxDA	N/A	N/A	9.49	9.49	
d7-N-MeFOSE	N/A	N/A	10.09	10.08	
d9-N-EtFOSE	N/A	N/A	10.72	10.71	
d3-N-MeFOSA	N/A	N/A	10.35	10.34	R
d5-N-EtFOSA	N/A	N/A	11.04	11.04	R

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-MW08	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958003	Total Amount Extracted	249mL
Lab File ID	A210525D_010	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 15:05	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	1.20	0.450	5.27	5.28	
PFBS	0.330	0.330	5.26	5.26	
PFHxA	0.066	0.0660	5.06	5.06	
4:2 FTS	2.20	0.560	4.82	4.83	
PFPeS	0.300	0.320	5.83	5.83	
PFHpA	0.310	0.280	5.57	5.57	
DONA	0.000	0.490	0.00	5.75	
PFHxS	0.240	0.260	6.34	6.35	
PFOA	0.420	0.350	6.03	6.04	
6:2 FTS	0.220	0.530	5.80	5.80	
PFHpS	0.300	0.230	6.82	6.83	
PFNA	0.230	0.190	6.48	6.49	
PFOSAm	N/A	N/A	8.84	8.84	
PFOS	0.160	0.230	7.18	7.29	
MeFOSA	0.740	0.870	10.37	10.37	
PFDA	0.095	0.0890	6.94	6.94	
EtFOSAm	1.50	0.710	11.06	11.07	
8:2 FTS	0.000	0.700	0.00	6.69	
9-Cl-PF3ON	0.000	0.0210	0.00	7.61	
PFNS	0.000	0.240	0.00	7.75	
PFUnDA	0.180	0.0930	7.38	7.39	
NMeFOSAA	0.000	0.590	6.87	6.88	
NEtFOSAA	0.500	0.660	7.09	7.09	
PFDS	0.360	0.240	8.18	8.19	
PFDOA	0.190	0.140	7.84	7.84	
MeFOSE	N/A	N/A	10.13	10.13	
EtFOSE	0.000	0.000	10.79	10.77	
11-Cl-PF3OUdS	0.000	0.0140	8.83	8.49	
PFTrDA	0.000	0.150	8.28	8.28	
PFDoS	0.000	0.230	0.00	9.00	
PFTDA	0.160	0.140	8.71	8.71	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958004	Total Amount Extracted	500mL
Lab File ID	A210525D_011	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 13:00	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	ND	0.500	0.500	0.150	1	375-22-4	
PFPeA	ND	0.500	0.500	0.098	1	2706-90-3	
HFPO-DA	ND	0.500	0.500	0.093	1	13252-13-6	
PFBS	ND	0.442	0.442	0.102	1	375-73-5	
PFHxA	ND	0.500	0.500	0.112	1	307-24-4	
4:2 FTS	ND	0.467	0.467	0.149	1	757124-72-4	
PFPeS	ND	0.470	0.470	0.117	1	2706-91-4	
PFHpA	ND	0.500	0.500	0.138	1	375-85-9	
DONA	ND	0.472	0.472	0.120	1	919005-14-4	
PFHxS	ND	0.455	0.455	0.077	1	355-46-4	
PFOA	ND	0.500	0.500	0.089	1	335-67-1	
6:2 FTS	ND	0.475	0.475	0.156	1	27619-97-2	
PFHpS	ND	0.475	0.475	0.118	1	375-92-8	
PFNA	ND	0.500	0.500	0.090	1	375-95-1	
PFOSAm	ND	0.500	0.500	0.108	1	754-91-6	
PFOS	ND	0.462	0.462	0.090	1	1763-23-1	
MeFOSA	ND	0.500	0.500	0.161	1	31506-32-8	
PFDA	ND	0.500	0.500	0.120	1	335-76-2	
EtFOSAm	ND	0.500	0.500	0.151	1	4151-50-2	
8:2 FTS	ND	0.480	0.480	0.156	1	39108-34-4	
9-Cl-PF3ON	ND	0.466	0.466	0.137	1	756426-58-1	
PFNS	ND	0.480	0.480	0.108	1	68259-12-1	
PFUnDA	ND	0.500	0.500	0.166	1	2058-94-8	
NMeFOSAA	ND	0.500	0.500	0.144	1	2355-31-9	
NEtFOSAA	ND	0.500	0.500	0.134	1	2991-50-6	
PFDS	ND	0.482	0.482	0.116	1	335-77-3	
PFDOA	ND	0.500	0.500	0.162	1	307-55-1	
MeFOSE	ND	0.500	0.500	0.108	1	24448-09-7	
EtFOSE	ND	0.500	0.500	0.137	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.471	0.471	0.121	1	763051-92-9	
PFTrDA	ND	0.500	0.500	0.163	1	72629-94-8	
PFDoS	ND	0.484	0.484	0.126	1	79780-39-5	
PFTDA	ND	0.500	0.500	0.082	1	376-06-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958004	Total Amount Extracted	500mL
Lab File ID	A210525D_011	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 13:00	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	9.99	9.88	99	50-200	
13C4_PFOA	9.99	9.42	94	50-200	
13C2_PFDA	9.99	9.27	93	50-200	
13C4_PFOS	9.56	9.71	102	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	9.99	10.6	107	50-200	
13C5_PFPeA	9.99	10.0	100	50-200	
13C3_PFBS	9.28	9.22	99	50-200	
13C2_4:2FTS	9.34	9.77	105	50-200	
13C5_PFHxA	9.99	10.1	101	50-200	
13C4_PFHpA	9.99	10.8	109	50-200	
13C3_PFHxS	9.45	9.25	98	50-200	
13C2_6:2FTS	9.48	10.0	105	50-200	
13C8_PFOA	9.99	10.3	104	50-200	
13C9_PFNA	9.99	9.96	100	50-200	
13C8_PFOS	9.56	10.2	107	50-200	
13C2_8:2FTS	9.57	10.4	108	50-200	
13C6_PFDA	9.99	10.8	108	50-200	
d3-MeFOSAA	9.99	12.3	123	50-200	
13C8_PFOSA	9.99	8.77	88	50-200	
d5-EtFOSAA	9.99	9.97	100	50-200	
13C7_PFUdA	9.99	11.8	118	50-200	
13C2_PFDoA	9.99	12.4	125	50-200	
13C2_PFTeDA	9.99	9.33	93	50-200	
13C3_HFPO-DA	9.99	9.52	95	50-200	
13C2_PFHxDA	9.99	9.13	91	50-200	
d7-N-MeFOSE	9.99	8.27	83	50-200	
d9-N-EtFOSE	9.99	8.20	82	50-200	
d3-N-MeFOSA	9.99	6.83	68	50-200	
d5-N-EtFOSA	9.99	6.90	69	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958004	Total Amount Extracted	500mL
Lab File ID	A210525D_011	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 13:00	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFOA	N/A	N/A	6.02	6.03	
13C2_PFDA	N/A	N/A	6.92	6.93	
13C4_PFOS	N/A	N/A	7.27	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.60	3.60	
13C5_PFPeA	N/A	N/A	4.44	4.45	
13C3_PFBS	N/A	N/A	5.24	5.25	
13C2_4:2FTS	N/A	N/A	4.82	4.83	
13C5_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.33	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.02	6.03	
13C9_PFNA	N/A	N/A	6.47	6.49	
13C8_PFOS	N/A	N/A	7.27	7.29	
13C2_8:2FTS	N/A	N/A	6.67	6.68	
13C6_PFDA	N/A	N/A	6.92	6.94	
d3-MeFOSAA	N/A	N/A	6.86	6.87	
13C8_PFOSA	N/A	N/A	8.83	8.84	
d5-EtFOSAA	N/A	N/A	7.07	7.08	
13C7_PFUdA	N/A	N/A	7.37	7.38	
13C2_PFDoA	N/A	N/A	7.82	7.84	
13C2_PFTeDA	N/A	N/A	8.69	8.71	
13C3_HFPO-DA	N/A	N/A	5.25	5.26	
13C2_PFHxDA	N/A	N/A	9.48	9.49	
d7-N-MeFOSE	N/A	N/A	10.07	10.08	
d9-N-EtFOSE	N/A	N/A	10.70	10.71	
d3-N-MeFOSA	N/A	N/A	10.33	10.34	
d5-N-EtFOSA	N/A	N/A	11.02	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Sample Analysis Summary

MPCA Guidance PFCs

Client Sample ID	SW27-EB01	Extraction Date	05/24/2021 12:45
Lab Sample ID	10559958004	Total Amount Extracted	500mL
Lab File ID	A210525D_011	Ical ID	210525C03
Matrix	Ground_Water	CCal File	A210525D_002
Collected	05/12/2021 13:00	Ending CCal File	A210525D_017
Received	05/12/2021 16:40	Blank File	A210525D_005

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	0.000	0.450	5.26	5.28	
PFBS	0.390	0.330	5.25	5.26	
PFHxA	0.071	0.0660	5.05	5.06	
4:2 FTS	0.000	0.560	0.00	4.83	
PFPeS	0.520	0.320	5.82	5.83	
PFHpA	0.320	0.280	5.56	5.57	
DONA	0.390	0.490	5.72	5.75	
PFHxS	0.150	0.260	6.34	6.35	
PFOA	0.670	0.350	6.03	6.04	
6:2 FTS	0.760	0.530	5.78	5.80	
PFHpS	1.00	0.230	6.88	6.83	
PFNA	0.210	0.190	6.48	6.49	
PFOSAm	N/A	N/A	8.83	8.84	
PFOS	0.073	0.230	7.28	7.29	
MeFOSA	0.750	0.870	10.36	10.37	
PFDA	0.032	0.0890	6.94	6.94	
EtFOSAm	1.20	0.710	11.06	11.07	
8:2 FTS	0.000	0.700	0.00	6.69	
9-Cl-PF3ON	0.000	0.0210	0.00	7.61	
PFNS	0.000	0.240	0.00	7.75	
PFUnDA	0.000	0.0930	7.38	7.39	
NMeFOSAA	0.000	0.590	0.00	6.88	
NEtFOSAA	0.000	0.660	7.09	7.09	
PFDS	0.260	0.240	8.19	8.19	
PFDOA	0.180	0.140	7.82	7.84	
MeFOSE	N/A	N/A	10.11	10.13	
EtFOSE	0.000	0.000	0.00	10.77	
11-Cl-PF3OUdS	0.000	0.0140	8.48	8.49	
PFTrDA	0.000	0.150	8.27	8.28	
PFDoS	0.000	0.230	0.00	9.00	
PFTDA	0.230	0.140	8.69	8.71	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKEC	Extraction Date	05/24/2021 12:45
Lab Sample ID	BLANK-90204	Total Amount Extracted	500mL
Lab File ID	A210525D_005	Ical ID	210525C03
Matrix	Water	CCal File	A210525D_002
Collected	05/20/2021 10:09	Ending CCal File	A210525D_017
Received	05/20/2021 10:09	Blank File	

Compound	Concentration (ng/L)	QL (ng/L)	RL (ng/L)	DL (ng/L)	Dil.	CAS No.	Qual.
PFBA	ND	0.50	0.50	0.15	1	375-22-4	
PFPeA	ND	0.50	0.50	0.099	1	2706-90-3	
HFPO-DA	ND	0.50	0.50	0.094	1	13252-13-6	
PFBS	ND	0.44	0.44	0.10	1	375-73-5	
PFHxA	ND	0.50	0.50	0.11	1	307-24-4	
4:2 FTS	ND	0.47	0.47	0.15	1	757124-72-4	
PFPeS	ND	0.47	0.47	0.12	1	2706-91-4	
PFHpA	ND	0.50	0.50	0.14	1	375-85-9	
DONA	ND	0.47	0.47	0.12	1	919005-14-4	
PFHxS	ND	0.45	0.45	0.078	1	355-46-4	
PFOA	ND	0.50	0.50	0.089	1	335-67-1	
6:2 FTS	ND	0.47	0.47	0.16	1	27619-97-2	
PFHpS	ND	0.47	0.47	0.12	1	375-92-8	
PFNA	ND	0.50	0.50	0.091	1	375-95-1	
PFOSAm	ND	0.50	0.50	0.11	1	754-91-6	
PFOS	ND	0.46	0.46	0.091	1	1763-23-1	
MeFOSA	ND	0.50	0.50	0.16	1	31506-32-8	
PFDA	ND	0.50	0.50	0.12	1	335-76-2	
EtFOSAm	ND	0.50	0.50	0.15	1	4151-50-2	
8:2 FTS	ND	0.48	0.48	0.16	1	39108-34-4	
9-Cl-PF3ON	ND	0.47	0.47	0.14	1	756426-58-1	
PFNS	ND	0.48	0.48	0.11	1	68259-12-1	
PFUnDA	ND	0.50	0.50	0.17	1	2058-94-8	
NMeFOSAA	ND	0.50	0.50	0.14	1	2355-31-9	
NEtFOSAA	ND	0.50	0.50	0.13	1	2991-50-6	
PFDS	ND	0.48	0.48	0.12	1	335-77-3	
PFDOA	ND	0.50	0.50	0.16	1	307-55-1	
MeFOSE	ND	0.50	0.50	0.11	1	24448-09-7	
EtFOSE	ND	0.50	0.50	0.14	1	1691-99-2	
11-Cl-PF3OUdS	ND	0.47	0.47	0.12	1	763051-92-9	
PFTrDA	ND	0.50	0.50	0.16	1	72629-94-8	
PFDoS	ND	0.48	0.48	0.13	1	79780-39-5	
PFTDA	ND	0.50	0.50	0.082	1	376-06-7	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKEC	Extraction Date	05/24/2021 12:45
Lab Sample ID	BLANK-90204	Total Amount Extracted	500mL
Lab File ID	A210525D_005	Ical ID	210525C03
Matrix	Water	CCal File	A210525D_002
Collected	05/20/2021 10:09	Ending CCal File	A210525D_017
Received	05/20/2021 10:09	Blank File	

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.0	9.6	96	50-200	
13C4_PFOA	10.0	9.6	96	50-200	
13C2_PFDA	10.0	10	101	50-200	
13C4_PFOS	9.6	9.1	95	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.0	9.6	96	50-200	
13C5_PFPeA	10.0	9.3	93	50-200	
13C3_PFBS	9.3	8.1	87	50-200	
13C2_4:2FTS	9.3	8.5	91	50-200	
13C5_PFHxA	10.0	9.1	91	50-200	
13C4_PFHpA	10.0	9.5	95	50-200	
13C3_PFHxS	9.5	8.8	93	50-200	
13C2_6:2FTS	9.5	8.1	86	50-200	
13C8_PFOA	10.0	8.8	88	50-200	
13C9_PFNA	10.0	9.0	90	50-200	
13C8_PFOS	9.6	9.3	97	50-200	
13C2_8:2FTS	9.6	9.3	97	50-200	
13C6_PFDA	10.0	9.3	93	50-200	
d3-MeFOSAA	10.0	10	100	50-200	
13C8_PFOSA	10.0	8.6	86	50-200	
d5-EtFOSAA	10.0	9.8	98	50-200	
13C7_PFUdA	10.0	9.6	96	50-200	
13C2_PFDoA	10.0	10	103	50-200	
13C2_PFTeDA	10.0	8.5	85	50-200	
13C3_HFPO-DA	10.0	9.2	92	50-200	
13C2_PFHxDA	10.0	8.5	85	50-200	
d7-N-MeFOSE	10.0	8.5	85	50-200	
d9-N-EtFOSE	10.0	8.6	86	50-200	
d3-N-MeFOSA	10.0	7.4	74	50-200	
d5-N-EtFOSA	10.0	7.4	74	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKEC	Extraction Date	05/24/2021 12:45
Lab Sample ID	BLANK-90204	Total Amount Extracted	500mL
Lab File ID	A210525D_005	Ical ID	210525C03
Matrix	Water	CCal File	A210525D_002
Collected	05/20/2021 10:09	Ending CCal File	A210525D_017
Received	05/20/2021 10:09	Blank File	

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFOA	N/A	N/A	6.02	6.03	
13C2_PFDA	N/A	N/A	6.92	6.93	
13C4_PFOS	N/A	N/A	7.27	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.59	3.60	
13C5_PFPeA	N/A	N/A	4.44	4.45	
13C3_PFBS	N/A	N/A	5.24	5.25	
13C2_4:2FTS	N/A	N/A	4.82	4.83	
13C5_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.33	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.02	6.03	
13C9_PFNA	N/A	N/A	6.47	6.49	
13C8_PFOS	N/A	N/A	7.27	7.29	
13C2_8:2FTS	N/A	N/A	6.67	6.68	
13C6_PFDA	N/A	N/A	6.92	6.94	
d3-MeFOSAA	N/A	N/A	6.86	6.87	
13C8_PFOSA	N/A	N/A	8.83	8.84	
d5-EtFOSAA	N/A	N/A	7.07	7.08	
13C7_PFUdA	N/A	N/A	7.37	7.38	
13C2_PFDoA	N/A	N/A	7.82	7.84	
13C2_PFTeDA	N/A	N/A	8.69	8.71	
13C3_HFPO-DA	N/A	N/A	5.25	5.26	
13C2_PFHxDA	N/A	N/A	9.48	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.70	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

Method Blank Analysis Summary

MPCA Guidance PFCs

Client Sample ID	BLKEC	Extraction Date	05/24/2021 12:45
Lab Sample ID	BLANK-90204	Total Amount Extracted	500mL
Lab File ID	A210525D_005	Ical ID	210525C03
Matrix	Water	CCal File	A210525D_002
Collected	05/20/2021 10:09	Ending CCal File	A210525D_017
Received	05/20/2021 10:09	Blank File	

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	0.000	0.450	5.27	5.28	
PFBS	0.340	0.330	5.25	5.26	
PFHxA	0.057	0.0660	5.05	5.06	
4:2 FTS	0.000	0.560	0.00	4.83	
PFPeS	0.000	0.320	5.83	5.83	
PFHpA	0.300	0.280	5.56	5.57	
DONA	0.000	0.490	5.73	5.75	
PFHxS	0.240	0.260	6.33	6.35	
PFOA	0.610	0.350	6.03	6.04	
6:2 FTS	0.540	0.530	5.79	5.80	
PFHpS	0.000	0.230	6.81	6.83	
PFNA	0.000	0.190	6.48	6.49	
PFOSAm	N/A	N/A	8.83	8.84	
PFOS	0.038	0.230	7.31	7.29	
MeFOSA	0.850	0.870	10.36	10.37	
PFDA	0.000	0.0890	0.00	6.94	
EtFOSAm	0.430	0.710	11.07	11.07	
8:2 FTS	0.000	0.700	0.00	6.69	
9-Cl-PF3ON	0.000	0.0210	7.60	7.61	
PFNS	0.000	0.240	7.73	7.75	
PFUnDA	0.000	0.0930	0.00	7.39	
NMeFOSAA	0.000	0.590	0.00	6.88	
NEtFOSAA	0.000	0.660	0.00	7.09	
PFDS	0.000	0.240	8.20	8.19	
PFDOA	0.260	0.140	7.83	7.84	
MeFOSE	N/A	N/A	10.12	10.13	
EtFOSE	0.000	0.000	10.77	10.77	
11-Cl-PF3OUdS	0.000	0.0140	8.48	8.49	
PFTrDA	0.000	0.150	8.28	8.28	
PFDoS	0.000	0.230	0.00	9.00	
PFTDA	0.083	0.140	8.70	8.71	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-90205	Instrument ID	10LCMS03
Run File Name	A210525D_006	Column ID	118AB10133
Analyzed	05/26/2021 01:48	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C2_PFHxA	10.0	8.29	83	50-200	
13C4_PFOA	10.0	8.70	87	50-200	
13C2_PFDA	10.0	8.65	86	50-200	
13C4_PFOS	9.59	8.14	85	50-200	

Extracted Internal Standards

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers
13C4_PFBA	10.0	9.13	91	50-200	
13C5_PFPeA	10.0	8.54	85	50-200	
13C3_PFBS	9.31	8.03	86	50-200	
13C2_4:2FTS	9.37	7.74	83	50-200	
13C5_PFHxA	10.0	8.45	84	50-200	
13C4_PFHpA	10.0	8.53	85	50-200	
13C3_PFHxS	9.48	7.82	82	50-200	
13C2_6:2FTS	9.51	8.09	85	50-200	
13C8_PFOA	10.0	8.72	87	50-200	
13C9_PFNA	10.0	8.80	88	50-200	
13C8_PFOS	9.59	8.12	85	50-200	
13C2_8:2FTS	9.60	8.88	93	50-200	
13C6_PFDA	10.0	8.65	86	50-200	
d3-MeFOSAA	10.0	9.94	99	50-200	
13C8_PFOSA	10.0	8.55	85	50-200	
d5-EtFOSAA	10.0	9.41	94	50-200	
13C7_PFUdA	10.0	8.70	87	50-200	
13C2_PFDoA	10.0	9.09	91	50-200	
13C2_PFTeDA	10.0	8.03	80	50-200	
13C3_HFPO-DA	10.0	8.67	87	50-200	
13C2_PFHxDA	10.0	8.15	81	50-200	
d7-N-MeFOSE	10.0	8.44	84	50-200	
d9-N-EtFOSE	10.0	8.49	85	50-200	
d3-N-MeFOSA	10.0	8.13	81	50-200	
d5-N-EtFOSA	10.0	8.31	83	50-200	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-90205	Instrument ID	10LCMS03
Run File Name	A210525D_006	Column ID	118AB10133
Analyzed	05/26/2021 01:48	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Known Conc.	Conc. Found	%Recovery	Recovery Limits	Qualifiers	CAS No.
PFBA	4.01	3.98	99	70-130		375-22-4
PFPeA	4.01	4.12	103	70-130		2706-90-3
HFPO-DA	4.01	4.05	101	70-130		13252-13-6
PFBS	3.55	3.35	94	70-130		375-73-5
PFHxA	4.01	3.99	100	70-130		307-24-4
4:2 FTS	3.75	4.20	112	70-130		757124-72-4
PFPeS	3.77	4.00	106	70-130		2706-91-4
PFHpA	4.01	3.97	99	70-130		375-85-9
DONA	3.79	3.64	96	70-130		919005-14-4
PFHxS	3.65	3.82	105	70-130		355-46-4
PFOA	4.01	3.94	98	70-130		335-67-1
6:2 FTS	3.81	3.47	91	70-130		27619-97-2
PFHpS	3.81	3.92	103	70-130		375-92-8
PFNA	4.01	3.93	98	70-130		375-95-1
PFOSAm	4.01	4.08	102	70-130		754-91-6
PFOS	3.71	3.72	100	70-130		1763-23-1
MeFOSA	4.01	4.12	103	70-130		31506-32-8
PFDA	4.01	3.89	97	70-130		335-76-2
EtFOSAm	4.01	3.98	99	70-130		4151-50-2
8:2 FTS	3.85	3.72	97	70-130		39108-34-4
9-Cl-PF3ON	3.74	3.71	99	70-130		756426-58-1
PFNS	3.85	3.92	102	70-130		68259-12-1
PFUnDA	4.01	4.09	102	70-130		2058-94-8
NMeFOSAA	4.01	3.68	92	70-130		2355-31-9
NEtFOSAA	4.01	4.08	102	70-130		2991-50-6
PFDS	3.87	3.71	96	70-130		335-77-3
PFDOA	4.01	4.04	101	70-130		307-55-1
MeFOSE	4.01	3.98	99	70-130		24448-09-7
EtFOSE	4.01	4.03	100	70-130		1691-99-2
11-Cl-PF3OUdS	3.78	3.73	99	70-130		763051-92-9
PFTrDA	4.01	3.65	91	70-130		72629-94-8
PFDoS	3.88	3.76	97	70-130		79780-39-5
PFTDA	4.01	4.02	100	70-130		376-06-7

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-90205	Instrument ID	10LCMS03
Run File Name	A210525D_006	Column ID	118AB10133
Analyzed	05/26/2021 01:48	Ical ID	210525C03
Injected By	QL	Level	L

Injection Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C2_PFHxA	N/A	N/A	5.04	5.05	
13C4_PFOA	N/A	N/A	6.02	6.03	
13C2_PFDA	N/A	N/A	6.92	6.93	
13C4_PFOS	N/A	N/A	7.27	7.28	

Extracted Internal Standards

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
13C4_PFBA	N/A	N/A	3.59	3.60	
13C5_PFPeA	N/A	N/A	4.44	4.45	
13C3_PFBS	N/A	N/A	5.24	5.25	
13C2_4:2FTS	N/A	N/A	4.82	4.83	
13C5_PFHxA	N/A	N/A	5.05	5.05	
13C4_PFHpA	N/A	N/A	5.56	5.57	
13C3_PFHxS	N/A	N/A	6.33	6.34	
13C2_6:2FTS	N/A	N/A	5.79	5.80	
13C8_PFOA	N/A	N/A	6.02	6.03	
13C9_PFNA	N/A	N/A	6.48	6.49	
13C8_PFOS	N/A	N/A	7.28	7.29	
13C2_8:2FTS	N/A	N/A	6.67	6.68	
13C6_PFDA	N/A	N/A	6.92	6.94	
d3-MeFOSAA	N/A	N/A	6.86	6.87	
13C8_PFOSA	N/A	N/A	8.83	8.84	
d5-EtFOSAA	N/A	N/A	7.07	7.08	
13C7_PFUdA	N/A	N/A	7.37	7.38	
13C2_PFDoA	N/A	N/A	7.83	7.84	
13C2_PFTeDA	N/A	N/A	8.70	8.71	
13C3_HFPO-DA	N/A	N/A	5.25	5.26	
13C2_PFHxDA	N/A	N/A	9.48	9.49	
d7-N-MeFOSE	N/A	N/A	10.08	10.08	
d9-N-EtFOSE	N/A	N/A	10.71	10.71	
d3-N-MeFOSA	N/A	N/A	10.34	10.34	
d5-N-EtFOSA	N/A	N/A	11.03	11.04	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444
www.pacelabs.com

LCS Analysis Summary

MPCA Guidance PFCs

Lab Sample ID	LCS-90205	Instrument ID	10LCMS03
Run File Name	A210525D_006	Column ID	118AB10133
Analyzed	05/26/2021 01:48	Ical ID	210525C03
Injected By	QL	Level	L

Native Analytes

Compound	Ion Abund. Ratio	Reference Ratio	Retention Time	Reference Time	Qualifiers
PFBA	N/A	N/A	3.60	3.60	
PFPeA	N/A	N/A	4.45	4.45	
HFPO-DA	0.45	0.45	5.27	5.28	
PFBS	0.34	0.33	5.25	5.26	
PFHxA	0.06	0.06	5.05	5.06	
4:2 FTS	0.51	0.56	4.82	4.83	
PFPeS	0.29	0.32	5.83	5.83	
PFHpA	0.30	0.28	5.56	5.57	
DONA	0.51	0.49	5.74	5.75	
PFHxS	0.27	0.26	6.34	6.35	
PFOA	0.38	0.35	6.03	6.04	
6:2 FTS	0.54	0.53	5.79	5.80	
PFHpS	0.23	0.23	6.82	6.83	
PFNA	0.19	0.19	6.48	6.49	
PFOSAm	N/A	N/A	8.83	8.84	
PFOS	0.23	0.23	7.28	7.29	
MeFOSA	0.87	0.87	10.36	10.37	
PFDA	0.09	0.08	6.93	6.94	
EtFOSAm	0.72	0.71	11.07	11.07	
8:2 FTS	0.61	0.70	6.67	6.69	
9-Cl-PF3ON	0.02	0.02	7.60	7.61	
PFNS	0.23	0.24	7.74	7.75	
PFUnDA	0.09	0.09	7.38	7.39	
NMeFOSAA	0.57	0.59	6.86	6.88	
NEtFOSAA	0.66	0.66	7.08	7.09	
PFDS	0.25	0.24	8.18	8.19	
PFDOA	0.13	0.14	7.83	7.84	
MeFOSE	N/A	N/A	10.12	10.13	
EtFOSE	0.00	0.00	10.77	10.77	
11-Cl-PF3OUdS	0.01	0.01	8.49	8.49	
PFTrDA	0.16	0.15	8.27	8.28	
PFDoS	0.23	0.23	9.00	9.00	
PFTDA	0.14	0.14	8.70	8.71	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.