SUPPLEMENTAL PHASE II ENVIRONMENTAL SITE ASSESSMENT

INTERSTATE 35W, MINNESOTA RIVER BRIDGE, BURNSVILLE, MINNESOTA
S.P. 1981-124

MINNESOTA DEPARTMENT OF TRANSPORTATION

WSP PROJECT NO.: 31401059.001
DATE: APRIL 17, 2018

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1 INTRODUCTION

1.1 PURPOSE

WSP was retained by the Minnesota Department of Transportation (MnDOT) to complete a Supplemental Phase II Environmental Site Assessment (ESA) along a segment of Interstate 35W (I-35W) from Cliff Road to Black Dog Road in Burnsville (SP 1981-124), Dakota County, Minnesota (Figure 1). MnDOT plans to replace the I-35W bridge over the Minnesota River and conduct highway reconstruction to the north and south of the bridge for additional travel lanes and MnPass lanes. WSP conducted Phase I and Phase II ESAs of the area from 106th Street West in Bloomington, Hennepin County, to Cliff Road in Burnsville, Dakota County, in 2014-2015. The 2014-2015 Phase II ESA identified elevated levels of methane in soil gas, diesel range organics (DRO), and metals in soil. The purpose of this Supplemental Phase II ESA was to quantify and better define the area of methane in the soil gas and metal contamination in the soil, determine if groundwater contamination is present, as well as to evaluate the potential presence of other contaminants within the supplemental Phase II ESA project area. The information obtained from this Supplemental Phase II ESA will be used by MnDOT to better evaluate portions of the construction area where environmental monitoring may be needed and to determine how to manage potential contamination during construction activities.

For the purposes of this report, the area of the 2014-2015 Phase I and Phase II ESA is referred to as the "project area" and the area investigated in this Supplemental Phase II ESA is identified as the "supplemental project area". WSP conducted the Supplemental Phase II ESA in a manner consistent with the Scope of Work and general requirements of the Professional and Technical Services Contract between MnDOT and WSP (MnDOT Contract No. 1029789) executed January 4, 2018 and amended on January 23, 2018.

1.2 SITE DESCRIPTION

The I-35W Minnesota River Bridge project area is located south of the Minneapolis metropolitan area, in Hennepin County (Bloomington) and Dakota County (Burnsville), Minnesota (Figure 2). The supplemental project area is an approximate 3-mile segment of I-35W, south of the Minnesota River. The ground surface within the supplemental project area is relatively flat with a slight downward slope to the north toward the Minnesota River. The I-35W roadway sits at a higher elevation than the surrounding area, sloping toward stormwater retention ponds to the east and west of the road.

Various commercial and industrial land use activities are present within and adjacent to the supplemental project area. An active quarry (Kraemer Mining and Minerals Quarry) and a closed landfill (Freeway Sanitary Landfill) are present adjacent to the western side of the supplemental project area, with an active landfill transfer station (Freeway Transfer) operating within a portion of the closed Freeway Landfill. Former landfills (former Astleford Central Dump and former Old Freeway Dump) are present adjacent to the southeast side of the supplemental project area. Grass and tree-covered undeveloped land and portions of the Minnesota Valley Wildlife Refuge are also located within the supplemental project area, including Black Dog Lake, adjacent to the northeastern side of the supplemental project area.

An asphalt-paved, multi-use recreational trail, Black Dog Trail, is present within the MnDOT right of way, adjacent to the eastern side I-35W, extending between Black Dog Road and Cliff Road. A frontage road, Embassy Road, is adjacent to the western side of I-35W, within the southern portion of the supplemental project area. Embassy Road formerly served the Burnsville Volkswagen dealership; however, the entrance to the road is now located on land acquired by the Kraemer quarry and a fence restricts access to the road.

1.3 PREVIOUS ENVIRONMENTAL REPORTS

WSP conducted Phase I and Phase II ESAs for the full project area from 106th Street West in Bloomington, Hennepin County, to Cliff Road in Burnsville, Dakota County, and submitted the findings to MnDOT in November 2014 and February 2015, respectively. A summary of previous reports is provided in this Section.

1.3.1 PHASE I ENVIRONMENTAL SITE ASSESSMENT

WSP completed a Phase I ESA of the project area in November 2014 (WSP, 2014), with Phase I site inspections completed in August 2014. As part of the Phase I ESA, WSP reviewed previous environmental reports at the Dakota County Environmental Management offices and the Minnesota Pollution Control Agency (MPCA) regarding the Kraemer Mining and Minerals Quarry, the former Astleford Central Dump, the former Old Freeway Dump, and the Freeway Sanitary Landfill, and the Freeway Transfer Station. Based on the environmental reports, the Kraemer Quarry was a demolition and construction debris disposal site that has been cleaned up and discontinued. The former Astleford Central Dump (now occupied by Dodge of Burnsville), the Old Freeway Dump, and Freeway Sanitary Landfill are Superfund sites with active remediation activities and known groundwater contamination. The Freeway Transfer Station is an active landfill transfer station within the groundwater area of concern for the former Freeway Sanitary Landfill.

Dakota County Environmental Management records also identified the western portion of the interchange between I-35W and Cliff Road as a former dump location called the "MnDOT Cloverleaf Dump." According to Dakota County information, MnDOT disposed of approximately 4,000 cubic yards of demolition and construction debris within the interchange location from 1990 to 1993. Oil staining was reportedly observed on or adjacent to some of the debris. This site is not identified in any database. There are no additional records to indicate whether the site was cleaned up. Dakota County Environmental Management noted that the site was a "low risk" dump.

MPCA information also indicated a potential for historic dumping of fly ash into the Minnesota Valley Wildlife Refuge wetlands located adjacent to the northeastern portion of the supplemental project area.

Nearly the entire area adjacent to the supplemental project area was identified in the Phase I ESA as high-risk based on the current and historic operations. The exceptions being, the former Burnsville Volkswagen dealership, a closed leaking underground storage tank (LUST) site, located adjacent to the southwestern side of I-35W, on property now owned by Kraemer Quarry (ranked medium) and Kramer Mining and Minerals, Inc. (ranked Low) (Figure 2).

As a result of information gathered during the Phase I ESA, WSP recommended that MnDOT conduct a Phase II ESA for locations where contaminated soil or groundwater may be encountered during the construction.

1.3.2 PHASE II ENVIRONMENTAL SITE ASSESSMENT

WSP completed a Phase II ESA of the project area in February 2015 (WSP, 2015), with subsurface drilling activities being completed in November 2014. The Phase II ESA was conducted to determine if historic activities had impacted soil or groundwater within the project area. The Phase II ESA included completion of 17 soil borings, field screening of soil samples for organic vapors and evidence of soil contamination, collection of soil and groundwater samples for analytical testing, and in-situ field screening of methane in soil gas. A total of seventeen soil samples were collected for analysis of organic compounds and Resource Conservation and Recovery Act (RCRA) metals. Groundwater was encountered in the unconsolidated materials in seven borings, and groundwater samples were collected from temporary wells installed in six of the borings for analysis of organic compounds and RCRA metals.

Methane was encountered in 11 of the 17 soil borings at concentrations ranging from 0.1 percent to 9.7 percent, as measured in the field with a multi-gas meter. Methane was encountered in all borings in proximity to the Freeway Sanitary Landfill at concentrations as high as 6.0 percent (DP-6) and 9.7 percent (DP-17), above the lower explosive limit (LEL) of 5 percent. The presence of methane in some borings may be partially attributed to natural decay processes in the native organic-rich soils. However, the methane present in borings located near the former sanitary landfill, specifically borings DP-6 and DP-17, was attributed to impacts from the former landfill.

No other field indications of soil contamination was encountered in any boring. No volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs) were detected in any soil samples above the regulatory reporting limit. DRO were detected above the MPCA unregulated fill criterion in one sample of fill material from boring DP-9.

Concentrations of arsenic, barium, and selenium in soils from DP-6 and concentrations of arsenic and total chromium in soils from DP-15 exceeded the MPCA's Soil Leaching Values (SLVs) and/or Soil Reference Values (SRVs). The concentrations of total chromium exceeded the criterion for hexavalent chromium at DP-15; however, the concentration of hexavalent chromium in that sample is likely far below any SLV or SRV for this analyte. Elevated concentrations of barium and selenium were detected in the fill material.

No organic compounds were detected at concentrations above the reporting limit in any groundwater sample. Concentrations of barium, cadmium, total chromium, and/or selenium in samples from borings DP-2, DP-3, DP-5, and DP-11 exceeded the Minnesota Department of Health (MDH) Health Based Values (HBVs). However, the groundwater samples were not filtered and contained fine sediment from the unconsolidated formation.

WSP recommended potential special handling of impacted soil during construction, as described below and in the 2015 Phase II Report.

- Methane in Soil Gas - Because of the high concentration of methane found in borings near the Freeway Sanitary Landfill, it was recommended that MnDOT conduct a methane gas survey within one year prior to beginning construction activities. The survey should consist of installation of temporary soil gas sample points along the construction corridor and collection of soil gas samples for analytical testing in a laboratory. Based on the findings of the soil gas survey, MnDOT may need to consider special provisions to address methane in soil gas during intrusive activities.
- Metals in Fill Materials - Elevated concentrations of arsenic, barium, and selenium were encountered in the fill material in soil from boring DP-6. During excavation of soils during road construction, fill material fitting the description of the material found in DP-6 should be segregated and sampled for RCRA metals. Pending the results of the analytical testing, fill material may need to be disposed of offsite.
- Metals in Soil – Elevated concentrations of arsenic were detected in a native soil sample collected from DP-15. Although the arsenic concentration detected in this sample is within the range of naturally-occurring arsenic in soil in Minnesota, the concentration detected in DP-15 is approximately an order of magnitude higher than the concentrations of arsenic detected in the other soil samples from the project area and the sample was collected adjacent to a former landfill site (Old Freeway Dump). Because arsenic exceeded the Tier 2 SRV in soil, special provisions for handling and management of soil from the DP-15 area should be incorporated into the construction plan.
- Groundwater – Although no evidence of contamination was found in the groundwater, environmental investigations conducted at adjacent properties have noted the presence of contamination in the bedrock aquifer underlying the unconsolidated materials. If MnDOT anticipates removal of bedrock material or dewatering of the bedrock aquifer, it is recommended that additional investigation of the bedrock aquifer be conducted. Results of groundwater the investigation could be used to determine whether special provisions need to be developed for dewatering operations.

2 SUPPLEMENTAL PHASE II INVESTIGATION PROCEDURES

2.1 FIELD INVESTIGATION

2.1.1 OVERVIEW

The Supplemental Phase II ESA field activities were conducted from February 1 through February 12, 2018. A summary of the borings, samples collected, and drilling methods is included in Tables 1A and 1B. The Supplemental Phase II ESA included the following:

- Completion of 21 soil borings using direct-push drilling technology
- Completion of 16 soil gas sampling points using direct-push drilling technology.
- Collection of soil samples for headspace (organic vapor) screening using a photoionization detector (PID)
- Logging of subsurface materials by a WSP geologist
- Collection of 40 soil samples for analytical testing
- Collection of 5 groundwater samples for analytical testing
- Measurement of the depth to groundwater
- Collection of 16 soil gas samples for analytical testing

The work plan for the Supplemental Phase II ESA was developed in consultation with the MnDOT Project Manager and is included as Appendix A.

The field work was conducted in accordance with applicable MPCA guidance and WSP's Standard Operating Procedures (SOPs; Appendix B). Summaries of boring placement, reason for selection, and total depth are provided in the work plan and in Tables 1A and 1B. Further details such as date of installation, saturated soil depth, measured depth to groundwater (where encountered), maximum PID reading, and soil and groundwater samples submitted for laboratory analysis are provided in Table 1A. Table 1B provides a summary of soil gas sample dates, depths, and PID measurements. Field-measured Universal Transverse Mercator coordinates for each boring are provided in Table 2 and approximate boring location elevations are included on the boring logs provided in Appendix C. The ground surface elevations at each boring were inferred from Google Earth™ and field observations.

2.1.2 SOIL BORING INSTALLATION

Soil borings were installed by Dakota Technologies, using a truck-mounted and a track-mounted Geoprobe direct-push technology drill rig. The locations of public utilities were identified through the Gopher One-Call system prior to beginning the intrusive work. Soil borings installed within the southern portion of the supplemental project area were accessed via Black Dog Trail east of I-35W (borings DP-29 through DP-33) and via Embassy Road west of I-35W (DP-34 through DP-38).

Soil samples were collected continuously through the extent of each boring. Soils were field screened for the presence of volatile organics using a PID equipped with a 10.6 electron-Volt (eV) lamp, calibrated to isobutylene and fresh air. Both ambient air and headspace measurements were collected in accordance with WSP's SOPs

(Appendix B) and applicable MPCA guidance. Soil boring descriptions were recorded for each boring by a WSP geologist and included sample depth, percent recovery, materials classification and description, and relative moisture content, as well as observations regarding staining or odor. The PID headspace measurements are provided in Table 3 and included on the boring logs (Appendix C). Final locations of soil borings are shown on Figures 2, 3A, 3B, 4A, and 4B.

All soil borings were sealed after sampling in accordance with MDH requirements. The MDH Well and Boring Sealing Records are included in Appendix C with the boring logs. Soil cuttings were thinspread on undeveloped surfaces within the MnDOT right-of-way.

2.2 SAMPLE COLLECTION AND ANALYTICAL TESTING

2.2.1 SOIL SAMPLES

A total of 40 soil samples were collected from 20 of the soil borings for laboratory analysis. Soil samples were typically collected from 2 to 3 feet below ground surface (bgs) and at the base of the boring, per the work plan. The soil samples were placed on ice immediately after collection. The soil samples and the analytical tests performed on each sample are listed in Table 1A. Samples were submitted to Pace Laboratories of Minneapolis, Minnesota (Pace) for analytical testing.

The soil samples were analyzed for a combination of the following parameters:

- DRO by the Wisconsin Modified DRO Method (WI Mod DRO) using silica gel cleanup. A silica gel cleanup procedure was requested for this analysis to preferentially remove polar and semi-polar compounds, which are likely biogenic (naturally occurring), from the sample. The cleanup provides the concentration of non-polar or petroleum hydrocarbons in the sample.
- U.S. Environmental Protection Agency (EPA) Priority Pollutant metals antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, nickel, selenium, silver, thallium, and zinc by EPA Method 6010 and mercury by EPA Method 7471, with arsenic and selenium run under Inductively-Coupled Plasma Mass Spectrometry methods.

2.2.2 GROUNDWATER SAMPLES

Temporary wells were installed in five soil borings to facilitate water level measurement and collection of a groundwater grab sample. Groundwater was encountered at depths ranging from approximately 17.6 feet bgs to 19.5 feet bgs (Table 1A), as measured in the borehole with a water-level indicator. Each temporary well was constructed with new, one-inch diameter Schedule 40 polyvinyl chloride casing with a five- or ten-foot length of 0.010-inch slotted screen. Water was drawn from the wells using a check-valve hand pump and dedicated tubing. Upon completion of sampling activities, the wells were removed and the borings backfilled in accordance with MDH regulations.

The groundwater samples were analyzed for a combination of the following parameters:

- Per- and polyfluoroalkyl substances (PFAS) by DV-LC-0012 and perfluoroctane sulfonamide
- Dissolved (field-filtered) EPA Priority Pollutant metals: antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, nickel, selenium, silver, thallium, and zinc by EPA Method 6010 and mercury by EPA Method 7470

The groundwater samples were placed on ice immediately after collection. The borings at which groundwater samples were collected, the screened interval, and the analytical tests performed on each sample are listed in Table 1A. Samples collected for metals were field filtered through a new 0.45-micron filter and submitted to Pace for analytical testing. Samples collected for PFAS were submitted to TestAmerica in Arvada, Colorado, for analytical testing.

Groundwater sampling for analysis of PFAS was conducted in consideration of potential contamination concerns from common manufactured supplies and clothes, as recommended in a National Groundwater Association (NGWA) PFAS State of Knowledge and Practice document (NGWA, 2017). Prior to beginning the field work, WSP also contacted the MDH for guidance on PFAS sampling procedures. The MDH stated that no written PFAS sampling procedure has yet been developed and provided a general electronic mail summary of precautions to be taken during sampling. Based on the guidance from MDH and NGWA, precautions taken during groundwater sampling for PFAS analysis using appropriate personal protective equipment (well-laundered clothing without waterproof additives and nitrile gloves), avoiding sun block and moisturizers, appropriate decontamination detergent, avoiding waterproof pens/markers, and not bringing any outside food to the job site.

2.2.3 SOIL GAS SAMPLES

All borings used for collection of soil gas samples were installed using a track-mounted Geoprobe direct-push drill rig in general accordance with MPCA guidance documents (2008, 2010a, 2010b).

At each soil gas sample location, the Geoprobe rod was advanced through a hydrated bentonite seal to the desired depth, the expendable drive point on the rod was disconnected and the rod raised to the desired upper sample interval, creating a void within the soil gas sample interval. Inert, dedicated tubing was inserted in a port at the bottom of the rod fitted with an O-ring to create a vacuum seal that prevents ambient air from entering the sample zone. Soil gas samples were collected from 8 to 10 feet bgs for the "worst-case soil gas sample", as recommended in Appendix D of MPCA's Vapor Intrusion Technical Support Document (2010a).

Prior to collecting the sample, a minimum of two sample port (sampler and tubing) volumes were purged using a graduated syringe to remove ambient air from the sample train. After sampling was complete, an organic vapor measurement was collected using a PID equipped with a 10.6 eV lamp.

Samples were collected in laboratory-supplied 1-liter evacuated canisters. The samples were collected by attaching the top end of the tubing to a laboratory-supplied 1-liter evacuated canister, equipped with a vacuum gauge and a flow regulator to ensure the sample collection rate did not exceed 200 milliliters per minute. The canister vacuum was monitored during sampling and collection was considered complete when the canister vacuum reduced to approximately 4 inches of mercury. Initial and final canister vacuum measurements, PID measurements, canister identification numbers, and sample identification numbers were recorded for all samples both in the field book and on the chain of custody. All soil vapor samples were submitted to Pace for analysis of VOCs by EPA Method TO-15 and methane by EPA Method TO-3M. The list of samples, their locations, sample depths, and post-sampling PID measurements are provided on Table 1B.

3 INVESTIGATION RESULTS

3.1 REGIONAL GEOLOGY

According to the U.S. Geological Survey's Bloomington, Minnesota, quadrangles (7.5-minute series) map, the ground elevation of the supplemental project area ranges from approximately 700 feet above mean sea level (amsl) at the Minnesota River to approximately 720 feet amsl near Cliff Road. Soils in the areas near the Minnesota River are comprised of clay- and organic-rich floodplain alluvium and organic-rich silt and clay and peat deposits (Meyer and Hobbs, 1989; Hobbs et al., 1990). South of the entrance and exit ramps at Black Dog Road, soils are primarily clean sand and gravel terrace deposits from the carving of the Minnesota River valley. Further south, near the entrance and exit ramps at Cliff Road, glacial outwash deposits from the Des Moines Lobe glaciation can be found (Hobbs et al., 1990). The bedrock strata underlying the project area consists of Jordan Sandstone and Prairie du Chien Group dolostone and sandstone. Bedrock depths are variable depending on the location within the project area and range from approximately 4 feet bgs south of the river to 120 feet bgs at the Minnesota Valley Wildlife Refuge north of the river (Bloomgren et al., 1989; Bloomgren et al., 1990).

3.2 REGIONAL HYDROLOGY

The nearest surface water body is the Minnesota River and smaller tributaries of the Minnesota River, located adjacent to the north end of the project area (Figure 1). The depth to groundwater within the project area is variable and dependent on location. The natural direction of groundwater flow in the project area is northward toward the Minnesota River (Palen, 1990). However, groundwater flow in this area is strongly influenced by a dewatering well located at the Kraemer Mining and Minerals Quarry, and flow is toward the dewatering well when it is actively pumping. The depth to groundwater south of the Minnesota River ranges from 4 feet bgs to greater than 30 feet bgs, depending on location.

3.3 SITE GEOLOGY

Field observations including soil type, headspace measurements, and evidence of environmental impact are summarized on soil boring logs in Appendix C. The surface cover of the supplemental project area consists primarily of asphalt roadways with adjacent unpaved shoulders.

In developed portions of the supplemental project area, fill material was present at depths ranging from approximately 1 to 3 feet in the southern portion of the project area to 15 to 20 feet near the Minnesota River. Fill material primarily consisted of poorly graded or well graded sand with silt and clay, with gravel present in some borings. Native material observed in the soil borings consisted of organic-rich soils and peat, grayish brown to gray silt riverbank deposits with sandy and clayey lenses, and sand with silt. Weathered limestone-type bedrock was encountered in several borings in the southern portion of the project area (DP-29 through DP-33, DP-37, and DP-38) at depths from approximately 8 to 10 feet bgs.

Local surface drainage within the supplemental project area is toward drainage ditches along the interstate. The surface water within ditches drains to retention areas within exit/entrance ramp cloverleafs. Drainage from the bridge is diverted to retention ponds on the north and south banks of the Minnesota River. Surface water overflow is presumed to be toward the Minnesota River.

The borings where groundwater was encountered are located relatively close to the Minnesota River and groundwater quality and groundwater level in these areas is expected to be heavily influenced by conditions in the

Minnesota River. Because no borings were installed into bedrock, a bedrock aquifer was not encountered. According to the Minnesota County Well Index, monitoring wells in the area are screened in the bedrock aquifer; therefore groundwater levels and groundwater quality from the temporary borings may not be consistent with the results of ongoing monitoring efforts in the underlying bedrock aquifer.

3.4 ORGANIC VAPOR SCREENING AND FIELD OBSERVATIONS

Elevated organic vapor measurements (greater than 10 parts per million [ppm]) were not encountered in any of the borings (Table 3). No visual or olfactory evidence of impacted soil was observed in any of the soil borings.

3.5 SOIL ANALYTICAL RESULTS

Soil sample analytical results were evaluated with respect to the MPCA's screening SLVs, Tier 1 (residential) SRVs, and Tier 2 (industrial exposure) SRVs (MPCA, 2009b, c). DRO results were compared to the MPCA's 100 milligram per kilogram (mg/kg) limit for GRO and DRO in soil established in the *Best Management Practices for the Off-Site Reuse of Unregulated Fill* (MPCA, 2012). Analytical results of soil sampling are summarized in Table 4 and illustrated on Figures 4A and 4B. Figures 4A and 4B also include analytical results of soil sampling conducted in 2014. Copies of the laboratory analytical reports are included in Appendix D. Soil sample identification consists of the boring number, followed by the depth interval from which the sample was taken. For example, DP-22(9-10) denotes a sample collected from direct-push soil boring DP-22 at the depth interval 9 to 10 feet bgs.

All soil samples were received by the laboratory in acceptable condition and were analyzed within the method hold times. Laboratory qualifiers, where present, are included and defined in the summary of results presented in Table 4. Non-detections are reported to the laboratory practical quantitation limit (PQL) for each analyte.

The analytical results are summarized below.

- **DRO:** DRO were detected above the PQL in all four soil samples for which they were analyzed (DP-32, DP-33, DP-36, DP-37) at depths of 4 to 5 feet bgs. The soil sample from boring DP-31 contained DRO at a concentration of 801 milligrams per kilogram (mg/kg), above the MPCA's 100 mg/kg *Unregulated Fill* criteria. The DRO concentrations in the other three borings ranged from 21 to 49.8 mg/kg, all below *Unregulated Fill* criteria.
- **Metals:** One or more Priority Pollutant metals were detected in all of the soil samples. Arsenic was detected in five soil samples exceeding the SLV, three of which also exceeded the SRV. Two soil samples exceeded the Tier 1 SRV of 9 mg/kg for arsenic with concentrations of 12.4 mg/kg [DP-32(9-10)] and 17.6 mg/kg [DP-33(4-5)]. One soil sample contained arsenic at a concentration of 23.8 mg/kg [DP-31(4-5)], above the Tier 2 SRV for industrial exposure of 20 mg/kg. The other two soil samples which exceeded the SLV contained arsenic concentrations ranging from 5.9 mg/kg to 6.6 mg/kg, values below the Background Threshold Value (BTV) established by the MPCA for arsenic in soil in Minnesota, and may be representative of background concentrations rather than soil contamination (MPCA, 2016).

  The concentration of total chromium exceeded the SLV for hexavalent chromium in the shallow soil sample from boring DP-31, but not the SLV or SRV for Chromium-III. Selenium was detected at a concentration of 27.8 mg/kg in boring DP-32 from 9 to 10 feet bgs, above the SLV of 2.6 mg/kg for that analyte. No other metals were detected at concentrations above their evaluation criteria.

3.6 GROUNDWATER ANALYTICAL RESULTS

The groundwater sample analytical results were evaluated with respect to the MDH Health Risk Limits (HRLs) and HBVs, as well as the EPA maximum contaminant level (MCL) where HRLs and HBVs are not established (MDH, 2018; EPA, 2018). Groundwater sample analytical results are provided in Table 5. Analytical results for select metals in groundwater are illustrated on Figure 5. Copies of the laboratory analytical reports are included in Appendix D.

All groundwater samples were received by the laboratory in acceptable condition and were analyzed within the method hold times. Laboratory qualifiers, where present, are included and defined in the summary of results presented in Table 4. Non-detections are reported to the PQL for each analyte.

Multiple metals were detected below the PQL at concentrations exceeding their HRLs. All three water samples analyzed for metals contained thallium at concentrations exceeding the HRL, though all were below the PQL. The water sample from DP-24 also contained concentrations of beryllium and cadmium above their HRLs. All of the metals exceeding HRLs were detected below the PQL and are therefore estimated concentrations.

The PFAS perfluorobutyric acid (PFBA) was detected above the PQL in three of the five water samples, all at concentrations well below the regulatory criteria. No other PFAS were detected in any of the water samples.

3.7 SOIL GAS ANALYTICAL RESULTS

Soil gas sample VOC results were evaluated with respect to the MPCA Industrial Indoor Air Intrusion Screening Values (ISVs). Where available, interim indoor air screening values, updated in February 2017, were used (MPCA, 2017). Where not available, MPCA's 2009 indoor air screening values were used (MPCA, 2009a). Methane results were evaluated with respect to the LEL. Analytical results of soil gas sampling are summarized in Table 6 and illustrated on Figure 6. Copies of the laboratory analytical reports are included in Appendix E. Soil gas sample identification consists of the designation "SG".

Several VOCs were detected in each of the soil gas samples at concentrations above the PQL. Only benzene was detected in one sample at a concentration that exceeded ISV criteria for Industrial Indoor Air. Benzene was detected at a concentration of 55.7 micrograms per cubic meter ($\mu g/m^3$) in soil gas sample location SG-16, which exceeds the 2017 Interim ISV criterion of 45 $\mu g/m^3$.

Methane was detected above the PQL in every soil gas sample. There is no ISV criteria for methane, so analytical results were compared to the LEL for that analyte. The LEL for methane is 5%, or 50,000 parts per million by volume (ppmv; PubChem, 2018). The LEL was exceeded in the soil gas sample from SG-12 with a methane concentration of 95,600 ppmv. The methane concentration from SG-16 was elevated but below the LEL with a concentration of 23,900 ppmv. Concentrations of methane in other samples were well below the LEL, ranging from 24.3 ppmv (SG-6) to 9,220 ppmv (SG-14).

PID measurements collected from the boring after soil gas sampling ranged from 0.0 ppm to 1.4 ppm.

4 CONCLUSIONS

The purpose of this investigation was to supplement soil and groundwater data collected during the previous 2014-2015 Phase II ESA and to better define the area of methane in the soil gas and metal and DRO contamination in the soil, determine if groundwater contamination is present including the potential presence of PFAS in groundwater. The information obtained from this supplemental Phase II ESA will be used by MnDOT to determine how to best address potential soil gas and soil contamination during construction activities. The Supplemental Phase II ESA included completion of 21 soil borings using direct-push drilling technology for collection of soil and groundwater, and installation of 16 soil gas sampling locations for collection of soil gas samples.

4.1 INVESTIGATION RESULTS SUMMARY

4.1.1 SOIL INVESTIGATION RESULTS SUMMARY

None of the headspace PID readings exceeded the MPCA criterion of 10 ppm in either the 2014 or 2018 field activities requiring offsite disposal of excavated soil (MPCA, 2012). No petroleum-saturated soil or soil that exhibited a sheen or petroleum odor was encountered in any boring.

Soil samples were typically collected from shallow soils in the interval of 2 to 3 feet bgs or 4 to 5 feet bgs, and deeper soils at the approximate base of each boring, as stipulated in the work plan.

DRO exceeded the *Unregulated Fill* criteria in the sample from boring DP-32 (4 to 5 feet bgs). DRO also exceeded the *Unregulated Fill* criteria in the 2014-2015 Phase II sample collected from DP-9 (4 to 5 feet bgs), located approximately 250 feet southwest of DP-32. The source of the DRO is unclear, as there is no source of petroleum contamination proximate to this location, there was no field evidence of contamination, and both samples were collected from native materials. No groundwater was encountered in either boring; therefore, migration of DRO to this location via groundwater flow is unlikely.

Arsenic was detected above the SLV in soil from borings DP-31, DP-32, and DP-33, completed in the southern portion of the project area along the Black Dog Trail east of I-35W. Arsenic was detected in soil samples from boring DP-31, and in soil samples from the adjacent 2014 soil boring DP-15, at levels exceeding the Tier 2 SRV. Chromium was also detected in borings DP-15 and DP-31 at levels exceeding the SLV. Selenium was also detected at a concentration exceeding the SLV in soil from boring DP-32.

Arsenic was detected above the SLV in the shallow soil sample from boring DP-24, completed in the northern portion of the project area along the west side of I-35W. The arsenic concentration in soil from the 2014 boring DP-6, approximately 200 feet south of DP-24, also exceeded the SLV.

4.1.2 GROUNDWATER INVESTIGATION SUMMARY

Multiple metals were detected at concentrations exceeding their HRLs. All three water samples (DP-24, DP-25, and DP-26) analyzed for metals contained thallium at concentrations exceeding the HRL, though all were below the PQL. The water sample from DP-24 also contained concentrations of beryllium and cadmium above their HRLs. All of the metals exceeding HRLs were detected below the PQL and are therefore estimated concentrations.

PFBA was detected above the PQL in three of the five water samples, all at concentrations well below the regulatory criteria. No other PFAS were detected in any of the water samples. The supplemental Phase II ESA results indicate that shallow groundwater within the supplemental project area has not been impacted by PFASs.

4.1.3 SOIL GAS INVESTIGATION SUMMARY

Soil gas samples contained several VOCs at concentrations above the PQL, primarily at concentrations below vapor intrusion screening criteria. Benzene was detected at SG-16 at a concentration exceeding the Industrial Indoor Air ISV. The source of benzene at SG-16 is unknown, as there is no identified source of benzene in this area and benzene was not detected in nearby soil samples. Methane was detected at SG-12 at a concentration exceeding the LEL. Methane was also detected slightly below the LEL in SG-16. The source of methane in soil gas samples is likely from the adjacent former landfills surrounding the project area.

4.2 RECOMMENDATIONS

4.2.1 CONSTRUCTION CONSIDERATIONS

The presence of impacted soil and groundwater may require special handling during construction, as described below.

Soil: Soil along the southern portion of the project area is impacted with multiple exceedances of metals as well as DRO of an unknown source area. Soil removed from this area should appropriately managed in accordance with MPCA regulations.

Groundwater: There were multiple exceedances of metals in groundwater above their respective HRLs. If dewatering is required for construction, the groundwater may require filtering and/or sampling prior to discharge.

Soil Gas: Methane concentrations exceeded the LEL in samples from one location (SG-12), located adjacent to the west side of I-35W adjacent to the Freeway Sanitary Landfill. Methane concentrations at SG-16, located adjacent to the east side of I-35W were also elevated, but did not exceed the LEL. The concentration of benzene detected in the soil gas sample at SG-16 exceeded the Industrial ISV. Methane monitoring of ambient air within excavations or other subsurface cuts in locations proximate to SG-12 and SG-16, and benzene monitoring in ambient air near SG-16, should be considered during subsurface work in these areas to maintain a safe working environment. WSP recommends that an air monitoring plan be developed in advance of subsurface work in these areas.

Special provisions should be completed to address proper screening, handling, and disposal of impacted soil and/or groundwater that may be encountered during construction activities. A construction monitoring consultant should be hired to observe work in construction areas where contaminated materials are likely to be encountered or where soil gas concentrations may result in health and safety concerns.

It is recommended that a contingency plan approach be incorporated into MnDOT's special provisions for this project to address the potential for encountering impacted soils, compounds of concern, and/or debris at other locations within the project area that were not detected during this Supplemental Phase II investigation.

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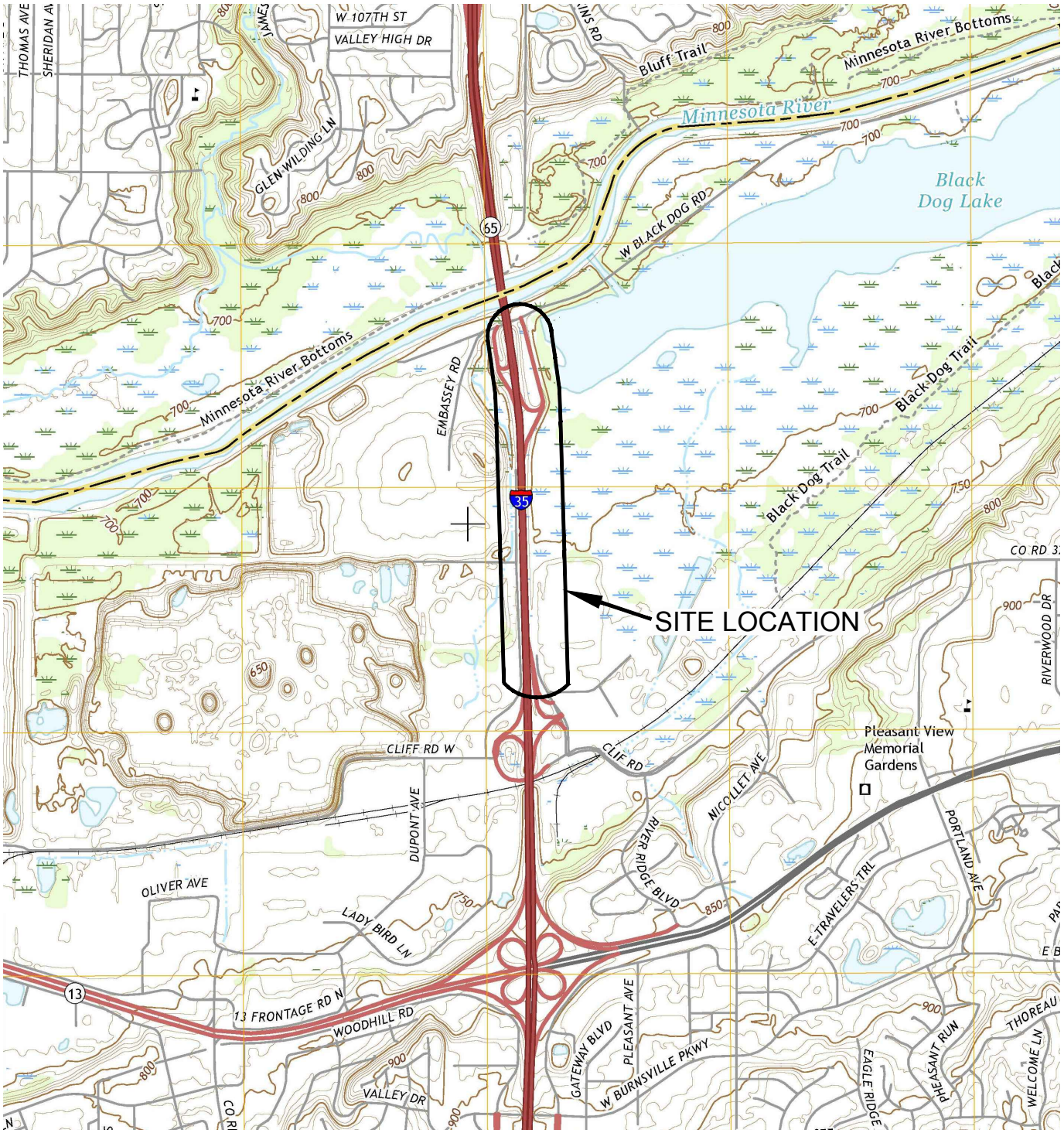
ACRONYMS

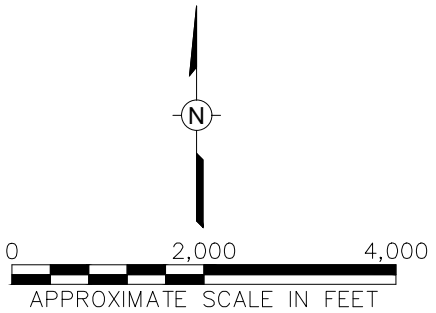
amsl	above mean sea level
BTV	Background Threshold Value
bgs	below ground surface
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
eV	electron-Volt
HBV	Health-Based Value
HRL	Health Risk Limit
ISV	Intrusion Screening Value
LEL	lower explosive limit
LUST	leaking underground storage tank
µg/m^3	micrograms per cubic meter
mg/kg	milligrams per kilogram
MCL	Maximum Contaminant Level
MDH	Minnesota Department of Health
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
NGWA	National Groundwater Association
PFAS	Per- and polyfluoroalkyl substances
PFBA	Perfluorobutyric acid
PID	photoionization detector
ppm	parts per million
ppmv	parts per million by volume
PQL	Practical Quantitation Limit
PRP	Petroleum Remediation Program
RCRA	Resource Conservation and Recovery Act
SLV	Soil Leaching Value
SOP	Standard Operating Procedure
SRV	Soil Reference Value
SVOCs	semi-volatile organic compounds
VOCs	volatile organic compounds

FIGURES



REFERENCE
7.5 MINUTE SERIES TOPOGRAPHIC QUADRANGLE
BLOOMINGTON, MINNESOTA
2016

QUADRANGLE LOCATION



APPROXIMATE SCALE IN FEET

WSP USA Inc.
123 NORTH THIRD STREET
SUITE 507
MINNEAPOLIS, MN 55401
TEL: +1 612.343.0510

Figure 1

SITE LOCATION

INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981–124
BURNSVILLE, MINNESOTA
PREPARED FOR
MNDOT

A | Drawn By: LS 4/4/2018 | Checked: KPW 4/4/2018 | Approved: PMB 4/4/2018 | DWG Name: 314M1059-001

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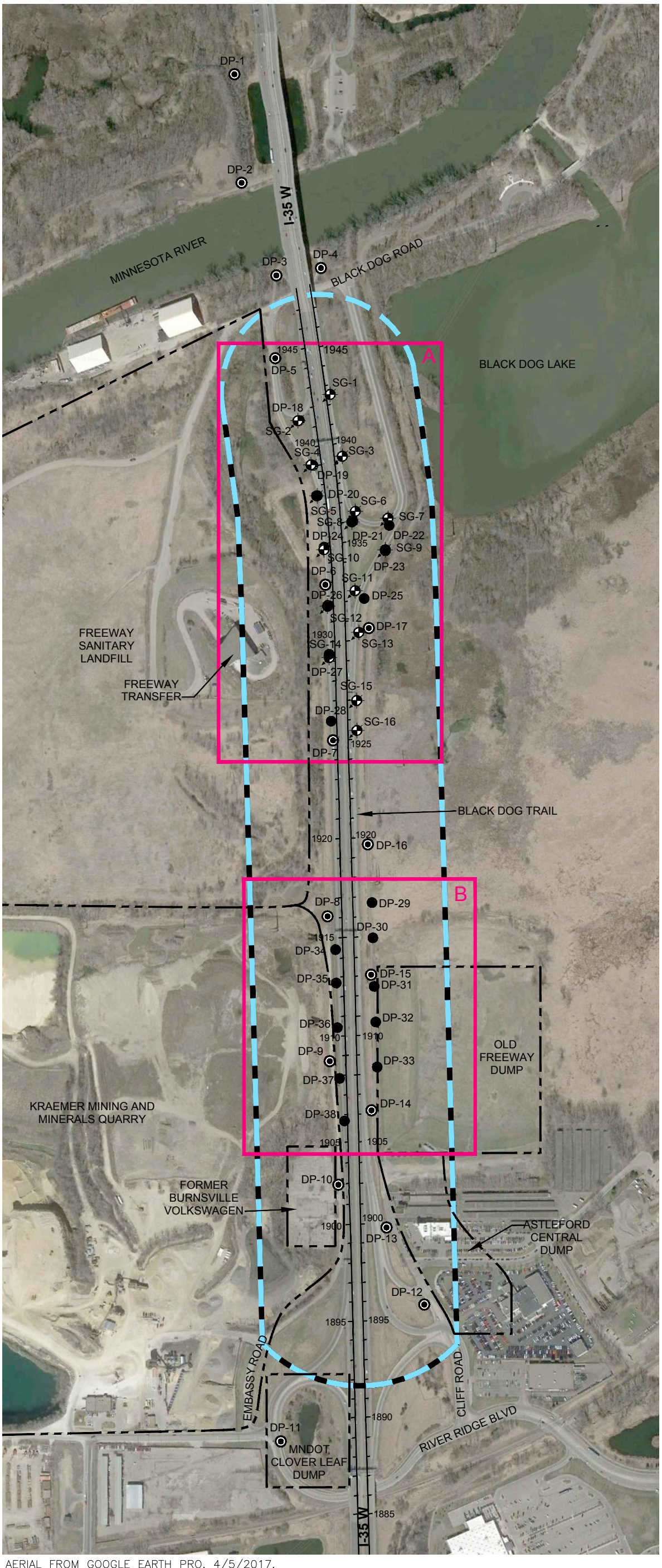

LEGEND

- 2014 PHASE II BORING LOCATION
- 2018 SOIL BORING LOCATION
- SOIL GAS SAMPLE LOCATION
- SUPPLEMENTAL PROJECT AREA BOUNDARY
- DETAIL AREAS
- APPROXIMATE PROPERTY BOUNDARIES
- STATION LOCATION (APPROXIMATE)

N

0 550 1,100

SCALE IN FEET

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Figure 2

PROJECT AREA

INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981-124
BURNSVILLE, MINNESOTA

PREPARED FOR
MNDOT

Drawn By:	LS	4/4/2018
Checked:	KPW	4/4/2018
Approved:	PMB	4/4/2018
DWG Name:	314M1059-002	

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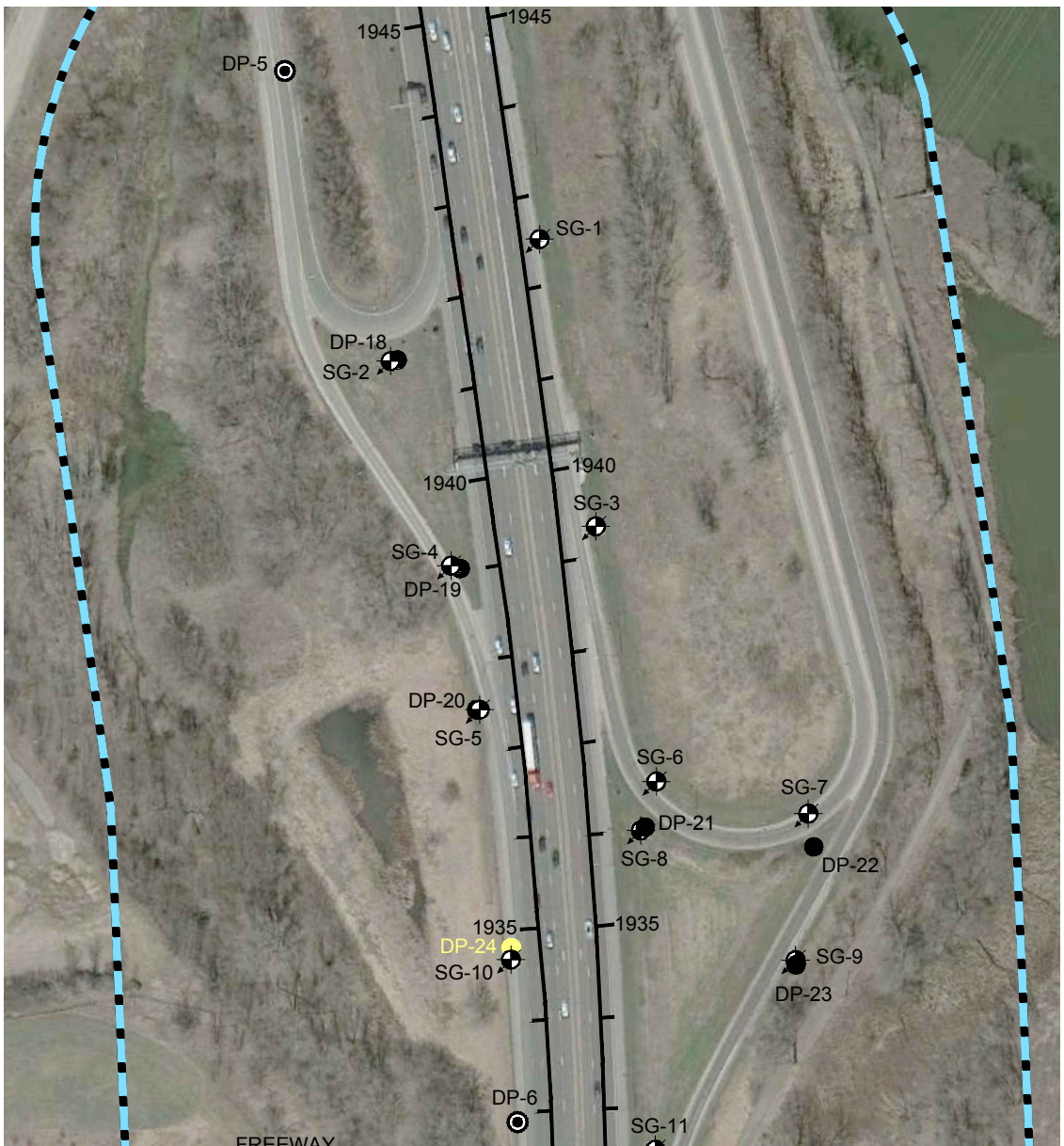

LEGEND

- 2014 PHASE II BORING LOCATION
- 2018 SOIL BORING LOCATION
- SOIL BORING LOCATION WITH GROUNDWATER SAMPLE
- SOIL GAS SAMPLE LOCATION
- SUPPLEMENTAL PROJECT AREA BOUNDARY
- DETAIL AREAS
- STATION LOCATION (APPROXIMATE)

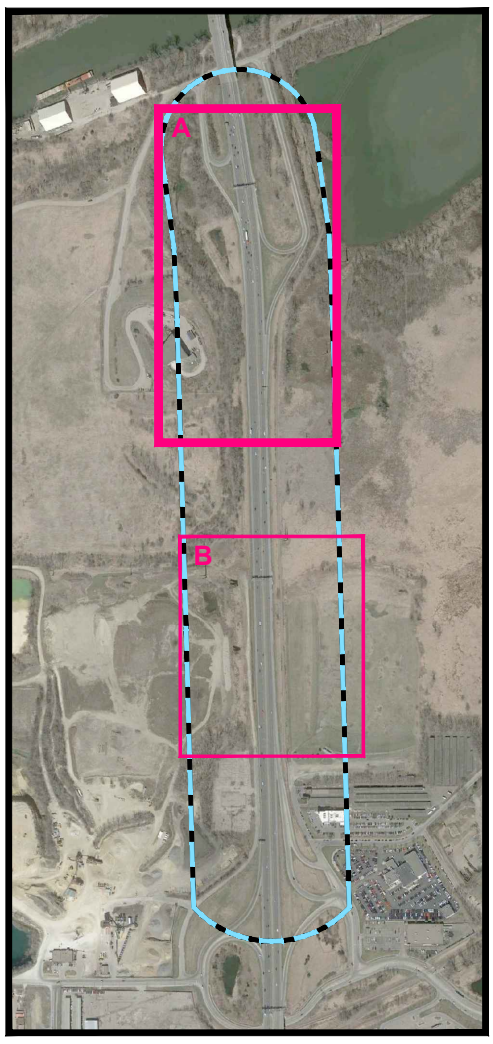

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Figure 3A

SITE LAYOUT

INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981-124
BURNSVILLE, MINNESOTA

PREPARED FOR
MNDOT

Drawn By:	LS	4/4/2018
Checked:	KPW	4/4/2018
Approved:	PMB	4/4/2018
DWG Name:	314M1059-003	

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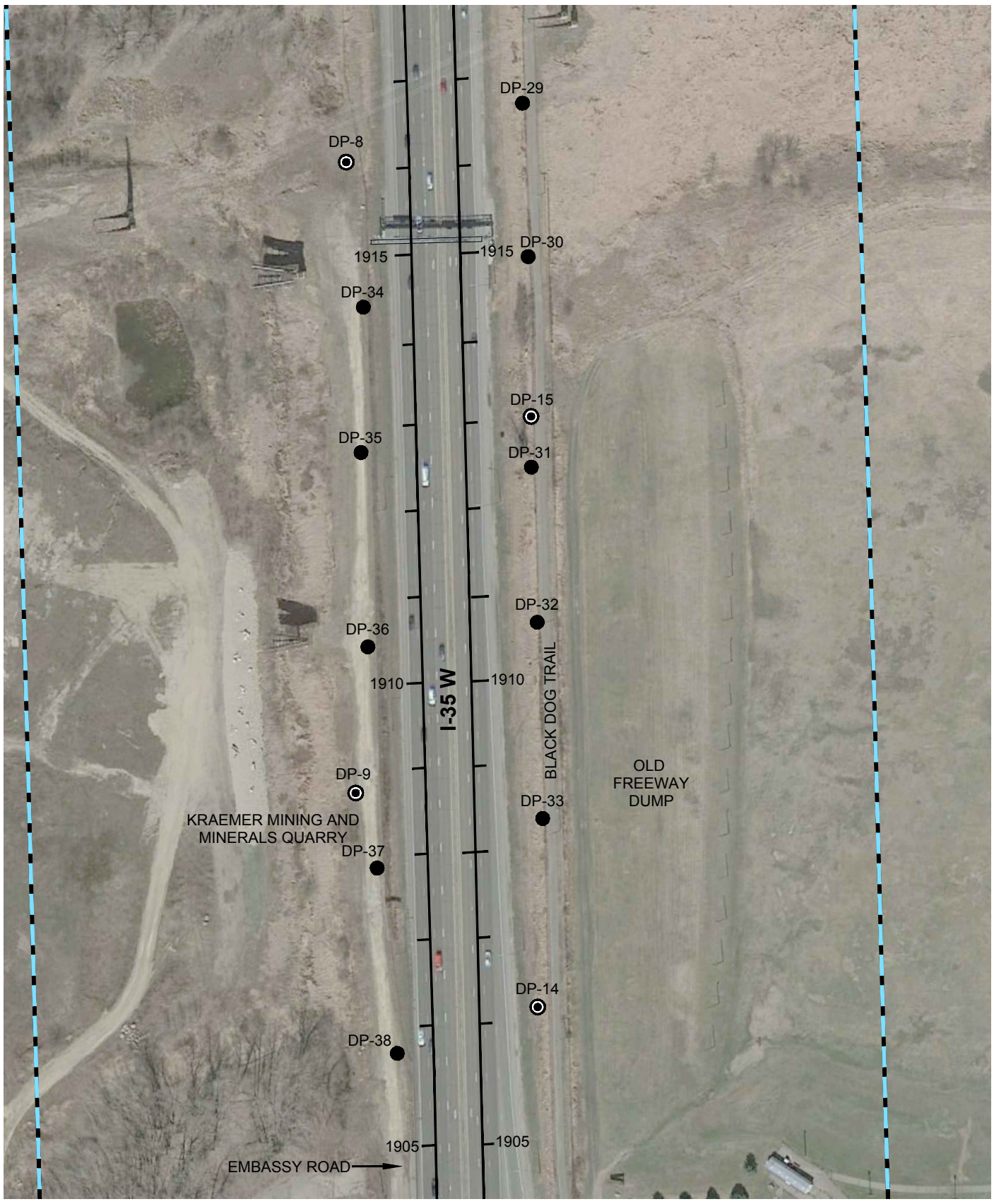

LEGEND

- 2014 PHASE II BORING LOCATION
- 2018 SOIL BORING LOCATION
- SOIL GAS SAMPLE LOCATION
- SUPPLEMENTAL PROJECT AREA BOUNDARY
- DETAIL AREAS
- STATION LOCATION (APPROXIMATE)

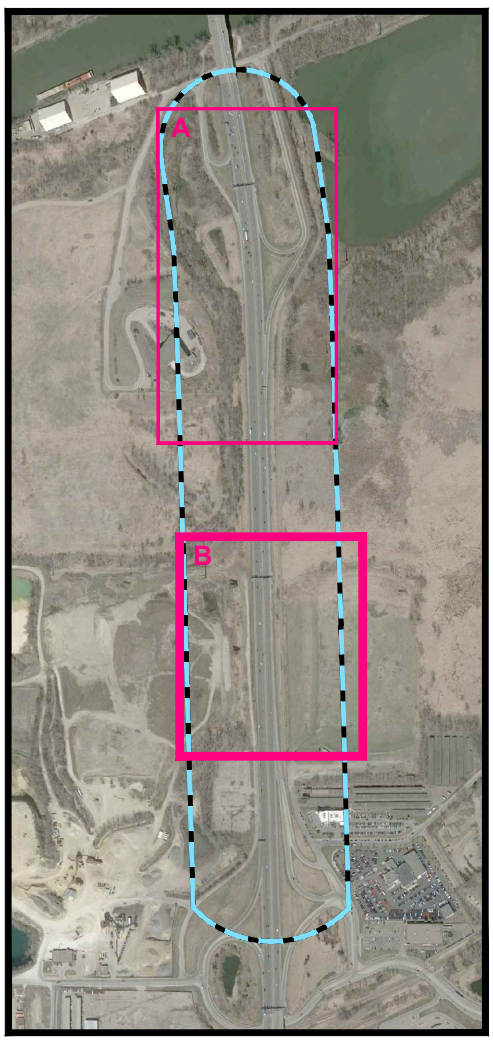

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Figure 3B

SITE LAYOUT

INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981–124
BURNSVILLE, MINNESOTA

PREPARED FOR

MNDOT

Drawn By:	LS 4/4/2018
Checked:	KPW 4/4/2018
Approved:	PMB 4/4/2018
DWG Name:	314M1059–004

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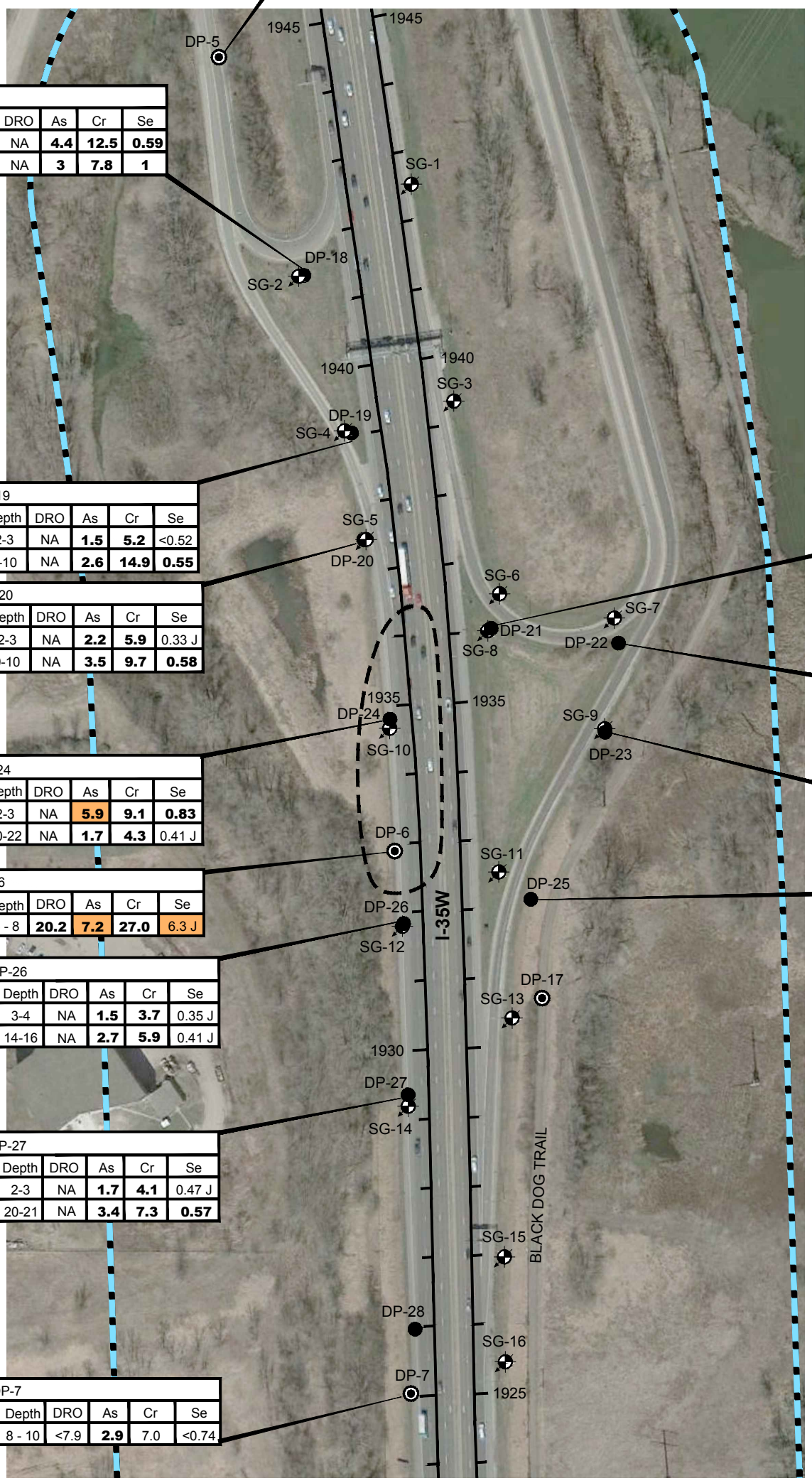

DP-5				
Depth	DRO	As	Cr	Se
9 - 10	<5.3	**2.7**	**10.7**	0.42 J

DP-18				
Depth	DRO	As	Cr	Se
2-3	NA	**4.4**	**12.5**	**0.59**
9-10	NA	**3**	**7.8**	**1**

DP-19				
Depth	DRO	As	Cr	Se
2-3	NA	**1.5**	**5.2**	<0.52
9-10	NA	**2.6**	**14.9**	**0.55**

DP-20				
Depth	DRO	As	Cr	Se
2-3	NA	**2.2**	**5.9**	0.33 J
9-10	NA	**3.5**	**9.7**	**0.58**

DP-24				
Depth	DRO	As	Cr	Se
2-3	NA	**5.9**	**9.1**	**0.83**
20-22	NA	**1.7**	**4.3**	0.41 J

DP-6				
Depth	DRO	As	Cr	Se
6 - 8	**20.2**	**7.2**	**27.0**	6.3 J

DP-26				
Depth	DRO	As	Cr	Se
3-4	NA	**1.5**	**3.7**	0.35 J
14-16	NA	**2.7**	**5.9**	0.41 J

DP-27				
Depth	DRO	As	Cr	Se
2-3	NA	**1.7**	**4.1**	0.47 J
20-21	NA	**3.4**	**7.3**	**0.57**

DP-7				
Depth	DRO	As	Cr	Se
8 - 10	<7.9	**2.9**	7.0	<0.74

LEGEND

- 2014 PHASE II BORING LOCATION
- 2018 SOIL BORING LOCATION
- SOIL GAS SAMPLE LOCATION
- SUPPLEMENTAL PROJECT AREA BOUNDARY
- DETAIL AREAS
- STATION LOCATION (APPROXIMATE)
- APPROXIMATE EXTENT OF SOIL EXCEEDENCES

DP-6				
Depth	DRO	As	Cr	Se
6 - 8	**20.2**	**7.2**	**27.0**	6.3 J

DEPTH IS MEASURED IN FEET BELOW GROUND SURFACE

ALL CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)

DRO DIESEL RANGE ORGANICS
~~As~~ ARSENIC
Cr CHROMIUM
Se SELENIUM

J ANALYTE WAS DETECTED ABOVE THE METHOD DETECTION LIMIT, BUT BELOW THE PRACTICAL QUANTITATION LIMIT. VALUE IS AN ESTIMATE.

SHADED VALUES INDICATE AN EXCEEDANCE OF A REGULATORY CRITERION FOR THAT ANALYTE

Regulatory Criteria (mg/kg):

ANALYTE	FILL (b)	SLV (c)	TIER 1 SRV(d)	TIER 2 SRV (e)
DRO	100	--	--	--
As	--	5.82	9	20
Cr (a)	--	36	87	650
Se	--	2.64	160	1,300

(a) REGULATORY CRITERION PROVIDED AS Cr VI; CONCENTRATIONS ARE PROVIDED AS TOTAL Cr
(b) MPCA UNREGULATED FILL CRITERIA (mg/kg)
(c) MPCA SCREENING SOIL LEACHING VALUE (mg/kg)
(d) MPCA TIER 1 SOIL REFERENCE VALUE (mg/kg)
(e) MPCA TIER 2 SOIL REFERENCE VALUE (mg/kg)

DP-21				
Depth	DRO	As	Cr	Se
2-3	NA	**2.7**	**7.5**	0.49 J
9-10	NA	**3.7**	**5.8**	**0.71**

DP-22				
Depth	DRO	As	Cr	Se
2-3	NA	**1.7**	**7.1**	0.38 J
9-10	NA	**2.3**	**4.3**	0.28 J

DP-23				
Depth	DRO	As	Cr	Se
2-3	NA	**1.9**	**4.5**	0.44 J
9-10	NA	**1.7**	**4.1**	0.33 J

DP-25				
Depth	DRO	As	Cr	Se
2-3	NA	**2.5**	**13.9**	0.47 J
16-17	NA	**2.8**	**6.2**	0.48 J

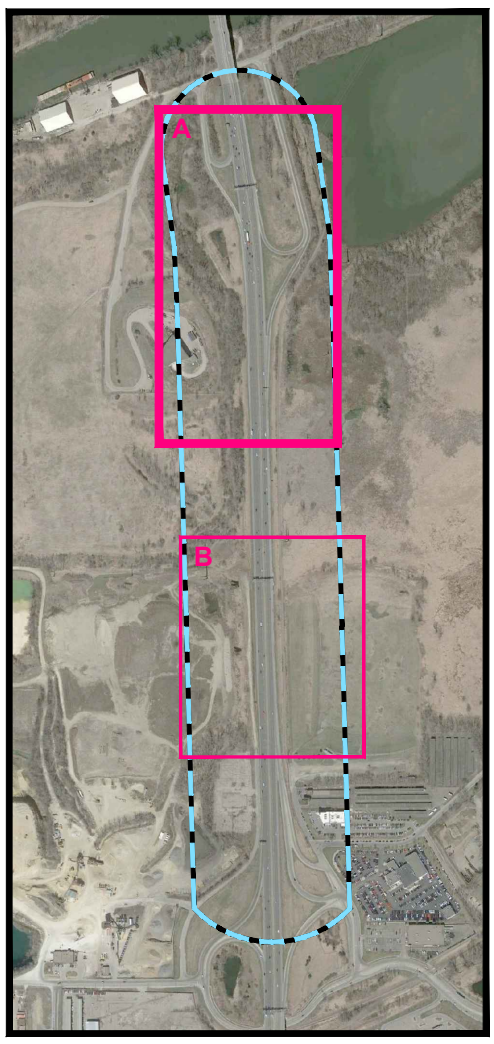

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Figure 4A

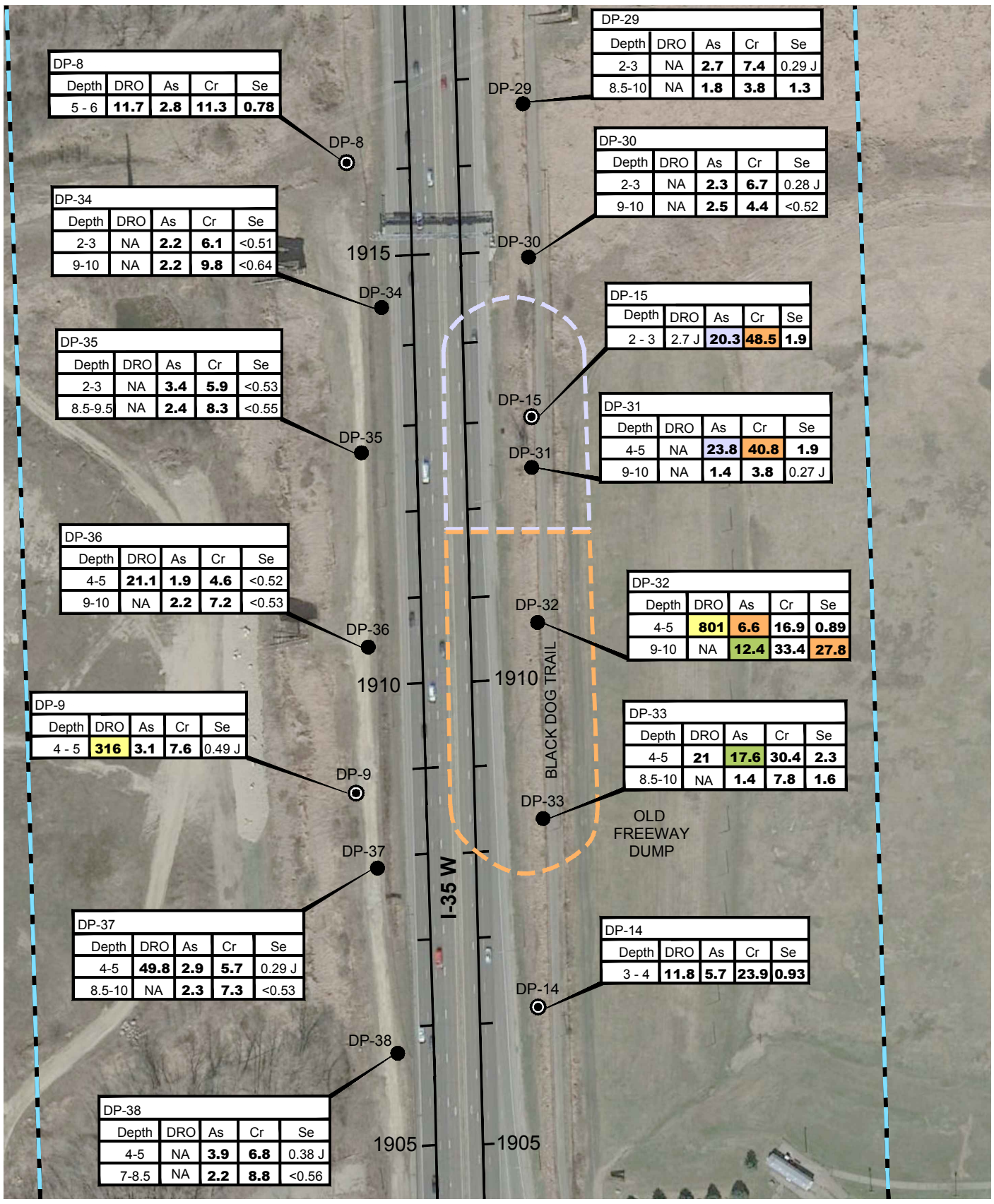
SUMMARY OF SOIL ANALYTICAL DATA

INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981-124
BURNSVILLE, MINNESOTA

PREPARED FOR
MNDOT

Drawn By:	LS	4/9/2018
Checked:	KPW	4/9/2018
Approved:	PMB	4/9/2018
DWG Name:	314M1059-005	

B



DP-8				
Depth	DRO	As	Cr	Se
5 - 6	**11.7**	**2.8**	**11.3**	**0.78**

DP-29				
Depth	DRO	As	Cr	Se
2-3	NA	**2.7**	**7.4**	0.29 J
8.5-10	NA	**1.8**	**3.8**	**1.3**

DP-30				
Depth	DRO	As	Cr	Se
2-3	NA	**2.3**	**6.7**	0.28 J
9-10	NA	**2.5**	**4.4**	<0.52

DP-34				
Depth	DRO	As	Cr	Se
2-3	NA	**2.2**	**6.1**	<0.51
9-10	NA	**2.2**	**9.8**	<0.64

DP-15				
Depth	DRO	As	Cr	Se
2 - 3	2.7 J	**20.3**	**48.5**	**1.9**

DP-35				
Depth	DRO	As	Cr	Se
2-3	NA	**3.4**	**5.9**	<0.53
8.5-9.5	NA	**2.4**	**8.3**	<0.55

DP-31				
Depth	DRO	As	Cr	Se
4-5	NA	**23.8**	**40.8**	**1.9**
9-10	NA	**1.4**	**3.8**	0.27 J

DP-36				
Depth	DRO	As	Cr	Se
4-5	**21.1**	**1.9**	**4.6**	<0.52
9-10	NA	**2.2**	**7.2**	<0.53

DP-32				
Depth	DRO	As	Cr	Se
4-5	**801**	**6.6**	**16.9**	**0.89**
9-10	NA	**12.4**	**33.4**	**27.8**

DP-9				
Depth	DRO	As	Cr	Se
4 - 5	**316**	**3.1**	**7.6**	0.49 J

DP-33				
Depth	DRO	As	Cr	Se
4-5	**21**	**17.6**	**30.4**	**2.3**
8.5-10	NA	**1.4**	**7.8**	**1.6**

DP-37				
Depth	DRO	As	Cr	Se
4-5	**49.8**	**2.9**	**5.7**	0.29 J
8.5-10	NA	**2.3**	**7.3**	<0.53

DP-14				
Depth	DRO	As	Cr	Se
3 - 4	**11.8**	**5.7**	**23.9**	**0.93**

DP-38				
Depth	DRO	As	Cr	Se
4-5	NA	**3.9**	**6.8**	0.38 J
7-8.5	NA	**2.2**	**8.8**	<0.56

LEGEND

- 2014 PHASE II BORING LOCATION
- 2018 SOIL BORING LOCATION
- SOIL GAS SAMPLE LOCATION
- SUPPLEMENTAL PROJECT AREA BOUNDARY
- DETAIL AREAS
- STATION LOCATION (APPROXIMATE)
- APPROXIMATE EXTENT OF SOIL EXCEEDANCES ABOVE TIER 2 SRV
- APPROXIMATE EXTENT OF SOIL EXCEEDANCES BETWEEN SLV AND TIER 2 SRV

DP-9				
Depth	DRO	As	Cr	Se
4 - 5	**316**	**3.1**	**7.6**	0.49 J

DEPTH IS MEASURED IN FEET BELOW GROUND SURFACE

ALL CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)

DRO DIESEL RANGE ORGANICS
As ARSENIC
Cr CHROMIUM
Se SELENIUM
J ANALYTE WAS DETECTED ABOVE THE METHOD DETECTION LIMIT, BUT BELOW THE PRACTICAL QUANTITATION LIMIT. VALUE IS AN ESTIMATE.

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Regulatory Criteria (mg/kg):

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(a) REGULATORY CRITERION PROVIDED AS Cr VI; CONCENTRATIONS ARE PROVIDED AS TOTAL Cr
(b) MPCA UNREGULATED FILL CRITERIA (mg/kg)
(c) MPCA SCREENING SOIL LEACHING VALUE (mg/kg)
(d) MPCA TIER 1 SOIL REFERENCE VALUE (mg/kg)
(e) MPCA TIER 2 SOIL REFERENCE VALUE (mg/kg)

N

0 160 320

SCALE IN FEET

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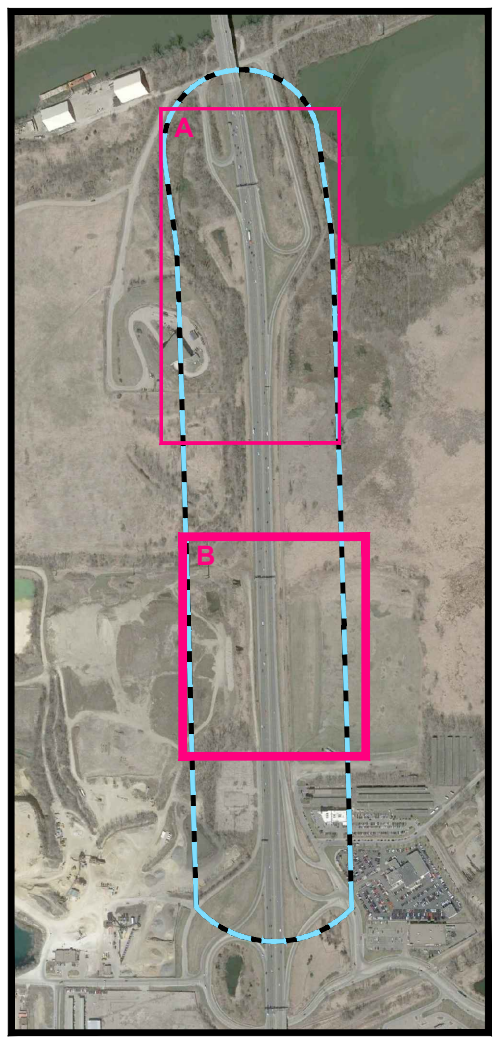

REFERENCE: AERIAL FROM GOOGLE EARTH PRO, 4/5/2017.

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MINNEAPOLIS, MN 55401
TEL: +1 612.343.0510

Figure 4B

SUMMARY OF SOIL ANALYTICAL DATA

INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981-124
BURNSVILLE, MINNESOTA

PREPARED FOR
MNDOT

Drawn By:	LS	4/9/2018
Checked:	KPW	4/9/2018
Approved:	PMB	4/9/2018
DWG Name:	314M1059-006	

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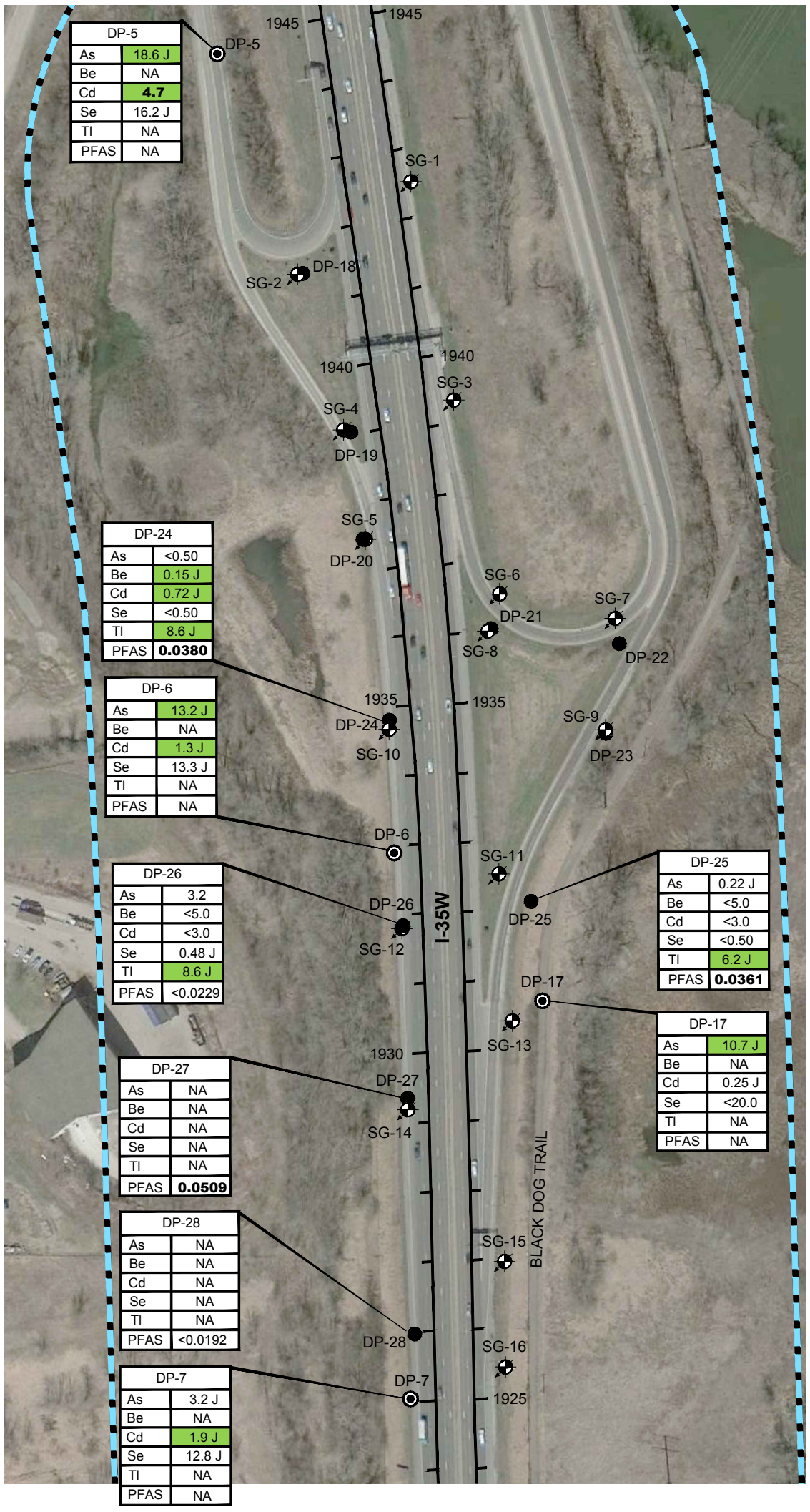


LEGEND

- 2014 PHASE II BORING LOCATION
- 2018 SOIL BORING LOCATION
- SOIL GAS SAMPLE LOCATION
- SUPPLEMENTAL PROJECT AREA BOUNDARY
- DETAIL AREAS
- STATION LOCATION (APPROXIMATE)

DP-5		BORING ID
As	**18.6 J**	ARSENIC
Be	NA	BERYLLIUM
Cd	**4.7**	CADMIUM
Se	16.2 J	SELENIUM
Tl	NA	THALLIUM
PFAS	NA	PER–AND POLYFLUOROALKYL SUBSTANCES

J — ANALYTE WAS DETECTED ABOVE THE METHOD DETECTION LIMIT, BUT BELOW THE PRACTICAL QUANTITATION LIMIT. VALUE IS AN ESTIMATE.

NA — NOT ANALYZED

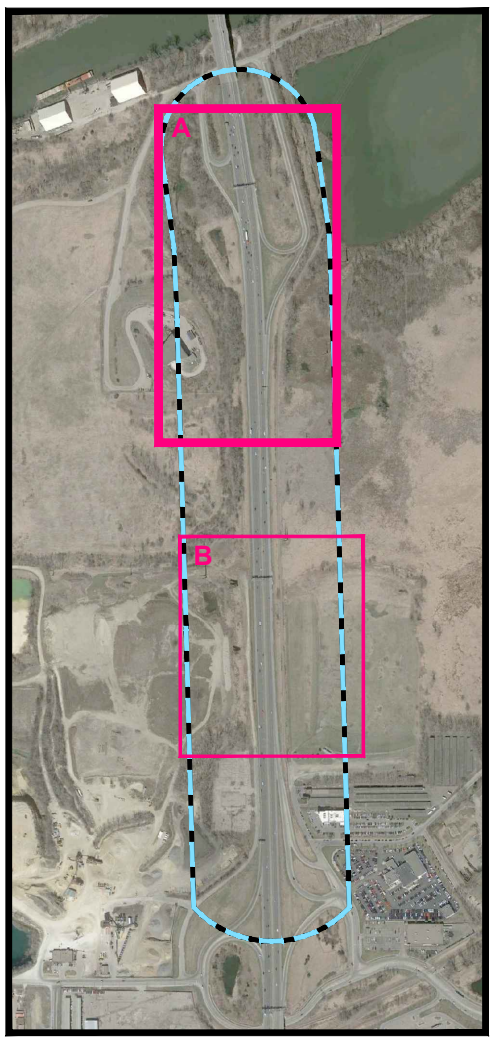
ALL CONCENTRATIONS IN MICROGRAMS PER LITER (ug/l)

SHADED VALUES INDICATE AN EXCEEDANCE OF REGULATORY CRITERION FOR THAT ANALYTE

NOTE: ONLY ANALYTES WITH ONE OR MORE EXCEEDANCE OF REGULATORY CRITERIA ARE PRESENTED TO ILLUSTRATE THE EXTENT OF IMPACTED SOIL.

Regulatory Criteria:

As	10 (a)	(a) U.S. EPA MAXIMUM CONTAMINANT LEVEL (ug/l)
Be	0.08 (b)	(b) MDH HEALTH RISK LIMIT (ug/l)
Cd	0.5 (b)	(c) MDH HEALTH BASED VALUE (ug/l)
Se	30 (b)	
PFAS	7(c)	



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0 200 400

SCALE IN FEET

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REFERENCE: AERIAL FROM GOOGLE EARTH PRO, 4/5/2017.

WSP USA Inc.
123 NORTH THIRD STREET
SUITE 507
MINNEAPOLIS, MN 55401
TEL: +1 612.343.0510

Figure 5

SUMMARY OF GROUNDWATER ANALYTICAL DATA

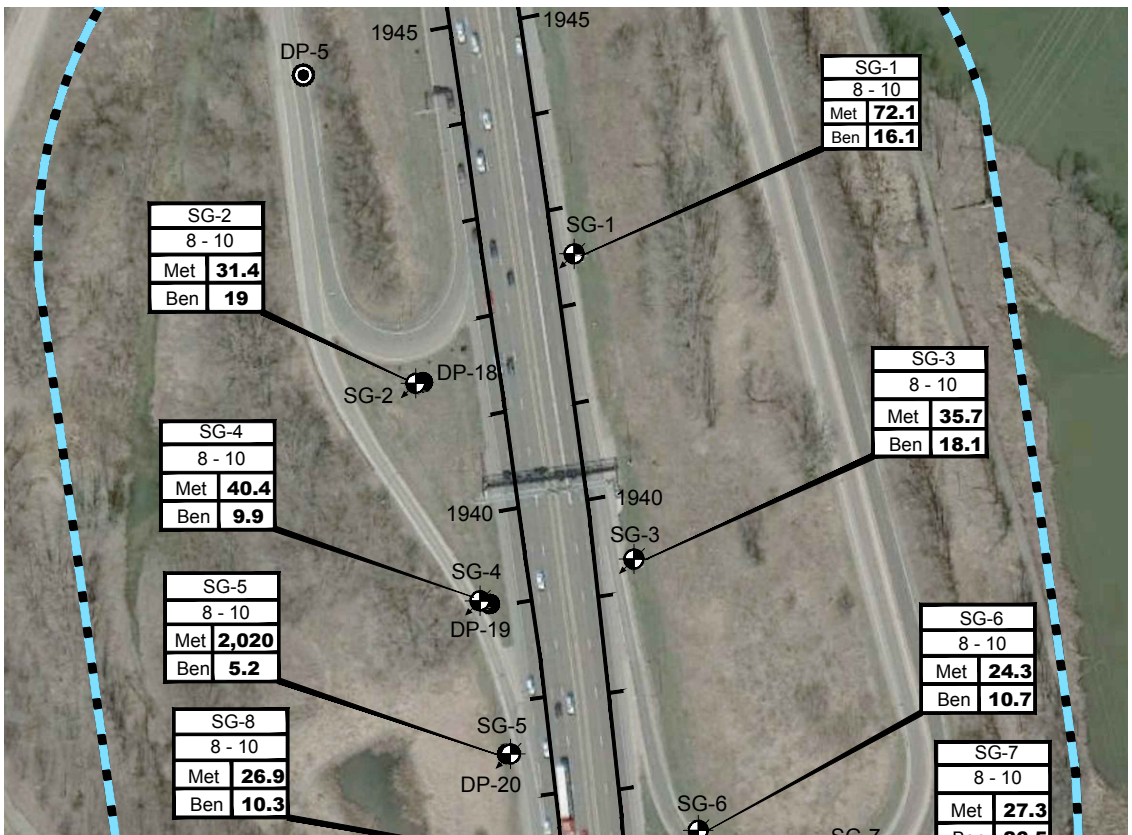
INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981–124
BURNSVILLE, MINNESOTA

PREPARED FOR
MNDOT

Drawn By:	LS	4/4/2018
Checked:	KPW	4/4/2018
Approved:	PMB	4/4/2018
DWG Name:	314M1059–007	

R:\Acad\CADD_CLIENTS\MNDOT\I 35-W MN RIVER BRIDGE\31401059\CADD\314M1059-008.dwg 4/17/2018 8:14 AM USLS01166

B



LEGEND

- 2014 PHASE II BORING LOCATION
- BORING PREVIOUSLY DETERMINED TO CONTAIN METHANE CONCENTRATIONS ABOVE THE LOWER EXPLOSIVE LIMIT (2014 FIELD EVALUATION)
- 2018 SOIL BORING LOCATION
- SOIL GAS SAMPLE LOCATION
- SUPPLEMENTAL PROJECT AREA BOUNDARY
- DETAIL AREAS
- STATION LOCATION (APPROXIMATE)
- APPROXIMATE EXTENT OF METHANE LEL EXCEEDANCES

SG-16	BORING ID
8 - 10	SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
Met 23,900	METHANE IN PARTS PER MILLION BY VOLUME (ppmv)
Ben 55.7	BENZENE IN MICROGRAMS PER CUBIC METER (ug/m^3)

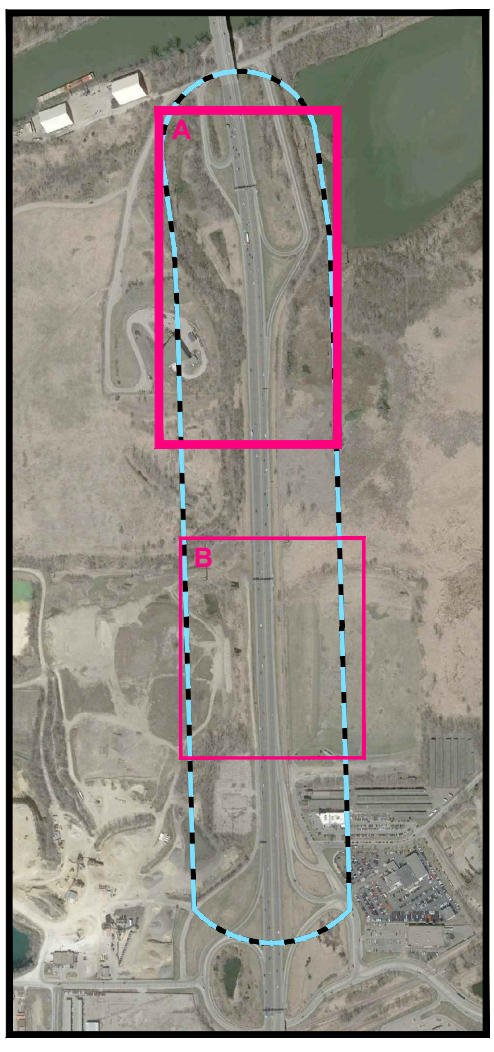
SHADED VALUES INDICATE AN EXCEEDANCE OF REGULATORY CRITERION FOR THAT ANALYTE

NOTE: ONLY ANALYTES WITH ONE OR MORE EXCEEDANCE OF REGULATORY CRITERIA ARE PRESENTED.

Regulatory Criteria:

Met	50,000 (a)
Ben	45 (b)

(a) LOWER EXPLOSIVE LIMIT FOR METHANE CONCENTRATIONS (CONVERTED TO ppmv)
(b) INTERIM INTRUSION SCREENING VALUE FOR COMMERCIAL/INDUSTRIAL INDOOR AIR (ug/m_3)



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0 200 400

SCALE IN FEET

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REFERENCE: AERIAL FROM GOOGLE EARTH PRO, 4/5/2017.

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Figure 6

SUMMARY OF SOIL GAS ANALYTICAL DATA

INTERSTATE 35W MINNESOTA RIVER BRIDGE
SUPPLEMENTAL PHASE II S.P. 1981–124
BURNSVILLE, MINNESOTA

PREPARED FOR
MNDOT

Drawn By:	LS	4/9/2018
Checked:	KPW	4/9/2018
Approved:	PMB	4/9/2018
DWG Name:	314M1059–008	

TABLES

Table 1A
Supplemental Phase II Soil Boring Placement and Analytical Testing Summary
Minnesota Department of Transportation
I 35W, Burnsville, Minnesota
S.P. 1981-124

Location ID	Installation Date	Reason for Selection	Saturated Soil Depth (feet bgs) (a)	Depth to Groundwater (feet bgs)	Total Boring Depth (feet bgs)	Max PID (ppm)	Soil Sample Intervals (feet bgs)	Soil Analytical Testing Parameters	Groundwater Analytical Testing Parameters
DP-18	02/12/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Not encountered	N/A	10	3	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-19	02/12/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Not encountered	N/A	10	2	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-20	02/12/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Not encountered	N/A	10	1	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-21	02/10/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Not encountered	N/A	10	2	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-22	02/10/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Not encountered	N/A	10	3	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-23	02/10/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Not encountered	N/A	10	1	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-24	02/11/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	22	19.5	27	8	2 - 3 20 - 22	Priority Pollutant Metals	PFAS, Priority Pollutant Metals
DP-25	02/12/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	17	17.6	23	9	2 - 3 16 - 17	Priority Pollutant Metals	PFAS, Priority Pollutant Metals
DP-26	02/11/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	16	17.8	20	2	2 - 3 20 - 22	Priority Pollutant Metals	PFAS, Priority Pollutant Metals
DP-27	02/11/18	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	19	17.6	25	1	2 - 3 20 - 21	Priority Pollutant Metals	PFAS

Table 1A
Supplemental Phase II Soil Boring Placement and Analytical Testing Summary
Minnesota Department of Transportation
I 35W, Burnsville, Minnesota
S.P. 1981-124

Location ID	Installation Date	Reason for Selection	Saturated Soil Depth (feet bgs) (a)	Depth to Groundwater (feet bgs)	Total Boring Depth (feet bgs)	Max PID (ppm)	Soil Sample Intervals (feet bgs)	Soil Analytical Testing Parameters	Groundwater Analytical Testing Parameters
DP-28	02/11/18	Provide information regarding the potential presence and magnitude of PFCs in groundwater adjacent to landfill area	10	18.2	19 (refusal)	2	N/A	N/A	PFAS
DP-29	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	Not encountered	N/A	10	3	2 - 3 8.5 - 10	Priority Pollutant Metals	N/A
DP-30	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	Not encountered	N/A	10	1	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-31	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	3.5 - 6	N/A	10	3	4 - 5 9 - 10	Priority Pollutant Metals	N/A
DP-32	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	5 - 9.6	N/A	10	2	4 - 5 9 - 10	DRO, Priority Pollutant Metals	N/A
DP-33	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	4 - 5	N/A	10	2	4 - 5 8.5 - 10	DRO, Priority Pollutant Metals	N/A
DP-34	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	Not encountered	N/A	10	5	2 - 3 9 - 10	Priority Pollutant Metals	N/A
DP-35	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	5 - 6	N/A	10	3	2 - 3 8.5 - 9.5	Priority Pollutant Metals	N/A
DP-36	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	Not encountered	N/A	10	0	4 - 5 9 - 10	DRO, Priority Pollutant Metals	N/A
DP-37	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	5.5 - 8.5	N/A	10	3	4 - 5 8.5 - 10	DRO, Priority Pollutant Metals	N/A

Table 1A
Supplemental Phase II Soil Boring Placement and Analytical Testing Summary
Minnesota Department of Transportation
I 35W, Burnsville, Minnesota
S.P. 1981-124

Location ID	Installation Date	Reason for Selection	Saturated Soil Depth (feet bgs) (a)	Depth to Groundwater (feet bgs)	Total Boring Depth (feet bgs)	Max PID (ppm)	Soil Sample Intervals (feet bgs)	Soil Analytical Testing Parameters	Groundwater Analytical Testing Parameters
DP-38	02/01/18	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	Not encountered	N/A	10	3	4 - 5 6 - 8.5	Priority Pollutant Metals	N/A

a\ bgs = below ground surface.
PID = photoionization dectector.
ppm = parts per million
DRO = diesel range organics.

N/A = Not applicable

Table 1B
Supplemental Phase II Soil Gas Sample Placement and Analytical Testing Summary
Minnesota Department of Transportation
I 35W, Burnsville, Minnesota
S.P. 1981-124 (a)

Sample ID	Sample Date	Reason for Selection	Soil Vapor Sample Interval (feet bgs)	PID Measurement (ppm)	Soil Gas Analytical Testing Parameters
SG-1	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.6	VOCs, methane
SG-2	02/12/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	1.4	VOCs, methane
SG-3	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	1.0	VOCs, methane
SG-4	02/12/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	1.2	VOCs, methane
SG-5	02/12/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.8	VOCs, methane
SG-6	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.5	VOCs, methane
SG-7	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.5	VOCs, methane
SG-8	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.3	VOCs, methane
SG-9	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.4	VOCs, methane
SG-10	02/11/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.2	VOCs, methane
SG-11	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.0	VOCs, methane
SG-12	02/11/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.0	VOCs, methane
SG-13	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.0	VOCs, methane
SG-14	02/11/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.0	VOCs, methane
SG-15	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	0.0	VOCs, methane
SG-16	02/10/18	Investigate whether soil gas has been affected by adjacent landfill and determine potential risk to construction workers.	8 - 10	1.4	VOCs, methane

a\ bgs = below ground surface.
PID = photoionization dectector.
ppm = parts per million.
VOCs = volatile organic compounds.

Table 2
Supplemental Phase II Soil Boring Location Summary
Minnesota Department of Transportation
I-35W, Burnsville, Minnesota
SP 1981-124 (a)

Location ID	Measurement Date	Zone 15 T	
		Easting (meters E)	Northing (meters N)
DP-18	02/17/18	477083.71	4960477.98
DP-19	02/17/18	477104.10	4960407.37
DP-20	02/17/18	477108.82	4960359.74
DP-21	02/17/18	477165.35	4960319.36
DP-22	02/17/18	477222.18	4960312.09
DP-23	02/17/18	477215.64	4960272.39
DP-24	02/17/18	477119.64	4960279.39
DP-25	02/17/18	477181.68	4960198.20
DP-26	02/17/18	477124.63	4960188.03
DP-27	02/17/18	477125.76	4960111.48
DP-28	02/17/18	477127.54	4960006.89
DP-29	02/17/18	477188.03	4959722.12
DP-30	02/17/18	477188.81	4959666.96
DP-31	02/17/18	477189.84	4959590.90
DP-32	02/17/18	477191.55	4959535.21
DP-33	02/17/18	477193.02	4959464.63
DP-34	02/17/18	477130.08	4959649.10
DP-35	02/17/18	477130.45	4959596.98
DP-36	02/17/18	477131.35	4959527.06
DP-37	02/17/18	477133.89	4959447.51
DP-38	02/17/18	477140.88	4959380.87
SG-01	02/17/18	477132.16	4960518.14
SG-02	02/17/18	477081.41	4960477.64
SG-03	02/17/18	477149.99	4960421.07
SG-04	02/17/18	477100.90	4960408.42
SG-05	02/17/18	477110.01	4960356.01
SG-06	02/17/18	477169.29	4960334.75
SG-07	02/17/18	477220.33	4960323.27
SG-08	02/17/18	477163.90	4960318.35
SG-09	02/17/18	477215.51	4960273.88
SG-10	02/17/18	477119.53	4960275.30
SG-11	02/17/18	477167.47	4960210.52
SG-12	02/17/18	477124.06	4960186.79
SG-13	02/17/18	477172.63	4960145.20
SG-14	02/17/18	477125.69	4960106.33
SG-15	02/17/18	477167.87	4960038.59
SG-16	02/17/18	477167.69	4959991.71

a/ All measurements collected using a Trimble Juno 3B.

Table 3
Supplemental Phase II Summary of Soil Sample Field Screening Results
Minnesota Department of Transportation
I 35W, Burnsville, Minnesota
S.P. 1981-124 (a)

Boring ID	Date	Depth in ft-bgs	PID Headspace (ppm)
DP-18	02/12/18	0 - 2.5	2
DP-18	02/12/18	2.5 - 5	1
DP-18	02/12/18	5 - 10	3
DP-19	02/12/18	0 - 2.5	2
DP-19	02/12/18	2.5 - 5	2
DP-19	02/12/18	5 - 7.5	2
DP-19	02/12/18	7.5 - 10	2
DP-20	02/12/18	0 - 2.5	0
DP-20	02/12/18	2.5 - 5	0
DP-20	02/12/18	5 - 10	1
DP-21	02/10/18	0 - 2.5	1
DP-21	02/10/18	2.5 - 5	1
DP-21	02/10/18	5 - 7.5	1
DP-21	02/10/18	7.5 - 10	2
DP-22	02/10/18	0 - 2.5	1
DP-22	02/10/18	2.5 - 5	2
DP-22	02/10/18	5 - 10	3
DP-23	02/10/18	0 - 2.5	0
DP-23	02/10/18	2.5 - 5	0
DP-23	02/10/18	5 - 7.5	1
DP-23	02/10/18	7.5 - 10	0
DP-24	02/11/18	0 - 2.5	4
DP-24	02/11/18	2.5 - 5	3
DP-24	02/11/18	5 - 10	4
DP-24	02/11/18	10 - 15	4
DP-24	02/11/18	15 - 20	4
DP-24	02/11/18	20 - 25	8
DP-24	02/11/18	25 - 27	5
DP-25	02/12/18	0 - 2.5	6
DP-25	02/12/18	2.5 - 5	8
DP-25	02/12/18	5 - 10	3
DP-25	02/12/18	10 - 12.5	3
DP-25	02/12/18	12.5 - 15	6
DP-25	02/12/18	15 - 17.5	7
DP-25	02/12/18	17.5 - 20	7
DP-25	02/12/18	20 - 23	9
DP-26	02/11/18	3 - 5	0
DP-26	02/11/18	5 - 10	2
DP-26	02/11/18	10 - 15	1
DP-26	02/11/18	15 - 20	2

Table 3
Supplemental Phase II Summary of Soil Sample Field Screening Results
Minnesota Department of Transportation
I 35W, Burnsville, Minnesota
S.P. 1981-124 (a)

Boring ID	Date	Depth in ft-bgs	PID Headspace (ppm)
DP-27	02/11/18	0 - 2.5	0
DP-27	02/11/18	2.5 - 5	0
DP-27	02/11/18	5 - 10	1
DP-27	02/11/18	10 - 15	1
DP-27	02/11/18	15 - 20	1
DP-27	02/11/18	20 - 25	0
DP-28	02/11/18	5 - 10	2
DP-28	02/11/18	10 - 15	1
DP-28	02/11/18	15 - 29	2
DP-29	02/01/18	0 - 5	2
DP-29	02/01/18	5 - 10	3
DP-30	02/01/18	0 - 5	1
DP-30	02/01/18	5 - 10	1
DP-31	02/01/18	0 - 5	3
DP-31	02/01/18	5 - 10	3
DP-32	02/01/18	0 - 5	2
DP-32	02/01/18	5 - 10	1
DP-33	02/01/18	0 - 5	2
DP-33	02/01/18	5 - 10	2
DP-34	02/01/18	0 - 5	5
DP-34	02/01/18	5 - 10	5
DP-35	02/01/18	0 - 5	2
DP-35	02/01/18	5 - 10	3
DP-36	02/01/18	0 - 5	0
DP-36	02/01/18	5 - 10	0
DP-37	02/01/18	0 - 5	0
DP-37	02/01/18	5 - 10	3
DP-38	02/01/18	0 - 5	3
DP-38	02/01/18	5 - 10	1

a\ PID = photoionization detector equipped with a 10.6 eV bulb and calibrated to isobutylene and fresh air.
PID measurements are rounded to the nearest whole number.
ft-bgs = feet below ground surface.
ppm = parts per million.

Table 4
Supplemental Phase II Soil Sample Analytical Results
Minnesota Department of Transportation
I 35W, Burnsvile, Minnesota
S.P. 1981-124 (a)

					Boring ID and Sample Depth (in feet below ground surface)											
	MPCA Screening Soil Leaching Value (b)	**MPCA Tier 1 Soil Reference Value (c)**	**MPCA Tier 2 Soil Reference Value (d)**	**GRO/DRO Criteria (e)**	**DP-5 (9-10) 11/13/14**	**DP-6 (6-8) 11/13/14**	**DP-7 (8-10) 11/13/14**	**DP-8 (5-6) 11/14/14**	**DP-9 (4-5) 11/14/14**	**DP-14 (3-4) 11/11/14**	**DP-15 (2-3) 11/11/14**	**DP-17 (6-7) 11/11/14**	**DP-18 (2-3) 02/12/18**	**DP-18 (9-10) 02/12/18**	**DP-19 (2-3) 02/12/18**	**DP-19 (9-10) 02/12/18**
Petroleum Hydrocarbons (WI Mod DRO)																
Diesel Range Organics	NE	NE	NE	100	<5.3	**20.2**	<7.9	**11.7**	**316**	**11.8**	2.7 J	**18.0**	NA	NA	NA	NA
Priority Pollutant Metals (EPA Methods 6010, 7471, SW7196A)																
Antimory	5.4	12	100	N/A	NA	NA	NA	NA	NA	NA	NA	NA	<1.1	<1.1	0.17 J	<1.0
Arsenic	5.8	9	20	N/A	**2.7**	**7.2**	**2.9**	**2.8**	**3.1**	**5.7**	**20.3**	**1.9**	**4.4**	**3.0**	**1.5**	**2.6**
Beryllium	2.7	55	230	N/A	NA	NA	NA	NA	NA	NA	NA	NA	0.040 J	0.035 J	<0.25	0.060 J
Cadmium	8.8	25	200	N/A	0.10 J	**0.33**	0.11 J	**0.20**	0.077 J	**0.79**	**2.2**	**0.21**	**0.21**	0.12 J	0.058 J	0.074 J
Chromium, Total	1,000,000,000/36 (f)	44,000/87 (f)	100,000/650 (f)	N/A	**10.7**	**27.0**	**7.0**	**11.3**	**7.6**	**23.9**	**48.5**	**11.1**	**12.5**	**7.8**	**5.2**	**14.9**
Copper	700	100	9,000	N/A	NA	NA	NA	NA	NA	NA	NA	NA	**14.4**	**7.5**	**5.5**	**17.3**
Lead	2,700	300	700	N/A	**3.0**	**10.5**	**3.1**	**6.2**	**5.4**	**49.4**	**27.4**	**7.9**	**55.0**	**3.4**	**2.0**	**3.9**
Nickel	180	560	2,500	N/A	NA	NA	NA	NA	NA	NA	NA	NA	**10.1**	**7.8**	**6.5**	**14.2**
Selenium	2.6	160	1,300	N/A	0.010 J	6.3 J	<0.74	**0.78**	0.49 J	**0.93**	**1.9**	**0.90**	**0.59**	**1.0**	<0.52	**0.55**
Silver	7.9	160	1,300	N/A	0.42 J	<0.76	<0.49	<0.44	<0.40	<0.48	<0.60	<0.49	<0.53	<0.54	<0.49	0.054 J
Thallium	89	3	21	N/A	NA	NA	NA	NA	NA	NA	NA	NA	<1.1	<1.1	<0.98	0.28 J
Zinc	3,000	8,700	75,000	N/A	NA	NA	NA	NA	NA	NA	NA	NA	**53.2**	**21.2**	**11.1**	**21.9**
Mercury	3.3	0.5	1.5	N/A	<0.55	0.056	0.0087 J	0.018 J	0.0079 J	0.020 J	**0.049**	0.012 J	**0.038**	0.017 J	<0.019	0.012 J

Table 4
Supplemental Phase II Soil Sample Analytical Results
Minnesota Department of Transportation
I 35W, Burnsvile, Minnesota
S.P. 1981-124 (a)

					Boring ID and Sample Depth (in feet bgs)											
	MPCA Screening Soil Leaching Value (b)	**MPCA Tier 1 Soil Reference Value (c)**	**MPCA Tier 2 Soil Reference Value (d)**	**GRO/DRO Criteria (e)**	**DP-20 (2-3) 02/12/18**	**DP-20 (9-10) 02/12/18**	**DP-21 (2-3) 02/10/18**	**DP-21 (9-10) 02/10/18**	**DP-22 (2-3) 02/10/18**	**DP-22 (9-10) 02/10/18**	**DP-23 (2-3) 02/10/18**	**DP-23 (9-10) 02/10/18**	**DP-24 (2-3) 02/11/18**	**DP-24 (20-22) 02/11/18**	**DP-25 (2-3) 02/12/18**	**DP-25 (16-17) 02/12/18**
Petroleum Hydrocarbons (WI Mod DRO)																
Diesel Range Organics	NE	NE	NE	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Priority Pollutant Metals (EPA Methods 6010, 7471, SW7196A)																
Antimory	5.4	12	100	N/A	<1.1	<1.1	0.41 J	0.24 J	<4.9	0.46 J	0.18 J	0.12 J	0.38 J	<1.1	<1.1	0.12 J
Arsenic	5.8	9	20	N/A	**2.2**	**3.5**	**2.7**	**3.7**	**1.7**	**2.3**	**1.9**	**1.7**	**5.9**	**1.7**	**2.5**	**2.8**
Beryllium	2.7	55	230	N/A	<0.27	0.084 J	0.044 J	0.049 J	<1.2	<0.27	<0.26	<0.26	0.11 J	<0.28	0.091 J	<0.26
Cadmium	8.8	25	200	N/A	0.085 J	0.13 J	0.053 J	0.077 J	0.096 J	0.058 J	0.089 J	0.060 J	0.15 J	0.036 J	0.14 J	0.058 J
Chromium, Total	1,000,000,000/36 (f)	44,000/87 (f)	100,000/650 (f)	N/A	**5.9**	**9.7**	**7.5**	**5.8**	**7.1**	**4.3**	**4.5**	**4.1**	**9.1**	**4.3**	**13.9**	**6.2**
Copper	700	100	9,000	N/A	**6.0**	**9.9**	**6.8**	**6.5**	**8.7**	**5.0**	**9.8**	**3.5**	**10.7**	**3.6**	**13.8**	**7.0**
Lead	2,700	300	700	N/A	**5.1**	**5.0**	**6.1**	**4.1**	**2.9**	**2.5**	**2.3**	**2.1**	**5.3**	**3.0**	**13.7**	**3.4**
Nickel	180	560	2,500	N/A	**6.2**	**13.4**	**8.2**	**8.5**	**8.1**	**7.3**	**7.5**	**7.8**	**14.0**	**4.2**	**10.7**	**8.3**
Selenium	2.6	160	1,300	N/A	0.33 J	**0.58**	0.49 J	**0.71**	0.38 J	0.28 J	0.44 J	0.33 J	**0.83**	0.41 J	0.47 J	0.48 J
Silver	7.9	160	1,300	N/A	<0.53	<0.55	<0.52	<0.54	<2.5	<0.53	0.046 J	0.041 J	0.052 J	<0.56	0.059 J	<0.51
Thallium	89	3	21	N/A	<1.1	<1.1	0.27 J	<1.1	<4.9	<1.1	<1.0	<1.0	<1.1	<1.1	0.27 J	<1.0
Zinc	3,000	8,700	75,000	N/A	**24.3**	**22.8**	**17.3**	**15.8**	**15.6**	**11.1**	**12.0**	**10.1**	**23.3**	**12.0**	**27.8**	**17.3**
Mercury	3.3	0.5	1.5	N/A	0.011 J	<0.021	0.013 J	0.013 J	<0.019	<0.021	<0.019	<0.020	**0.024**	<0.023	**0.029**	0.013 J

Table 4
Supplemental Phase II Soil Sample Analytical Results
Minnesota Department of Transportation
I 35W, Burnsvile, Minnesota
S.P. 1981-124 (a)

					Boring ID and Sample Depth (in feet bgs)											
	MPCA Screening Soil Leaching Value (b)	**MPCA Tier 1 Soil Reference Value (c)**	**MPCA Tier 2 Soil Reference Value (d)**	**GRO/DRO Criteria (e)**	**DP-26 (3-4) 02/11/18**	**DP-26 (14-16) 02/11/18**	**DP-27 (2-3) 02/11/18**	**DP-27 (20-21) 02/11/18**	**DP-29 (2-3) 02/01/18**	**DP-29 (8.5-10) 02/01/18**	**DP-30 (2-3) 02/01/18**	**DP-30 (9-10) 02/01/18**	**DP-31 (4-5) 02/01/18**	**DP-31 (9-10) 02/01/18**	**DP-32 (4-5) 02/01/18**	**DP-32 (9-10) 02/01/18**
Petroleum Hydrocarbons (WI Mod DRO)																
Diesel Range Organics	NE	NE	NE	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**801**	NA
Priority Pollutant Metals (EPA Methods 6010, 7471, SW7196A)																
Antimory	5.4	12	100	N/A	0.33 J	<1.1	0.37 J	0.26 J	<1.0	0.37 J	<1.0	0.33 J	0.98 J	0.28 J	<1.1	0.96 J
Arsenic	5.8	9	20	N/A	**1.5**	**2.7**	**1.7**	**3.4**	**2.7**	**1.8**	**2.3**	**2.5**	**23.8**	**1.4**	**6.6**	**12.4**
Beryllium	2.7	55	230	N/A	<0.26	<0.26	<0.26	0.048 J	0.24 J	<0.37	0.20 J	<0.26	**2.6**	<0.26	**0.89**	**1.9**
Cadmium	8.8	25	200	N/A	0.044 J	0.053 J	0.069 J	0.072 J	0.074 J	**0.57**	0.056 J	0.057 J	**1.7**	0.051 J	**0.57**	**1.2**
Chromium, Total	1,000,000,000/36 (f)	44,000/87 (f)	100,000/650 (f)	N/A	**3.7**	**5.9**	**4.1**	**7.3**	**7.4**	**3.8**	**6.7**	**4.4**	**40.8**	**3.8**	**16.9**	**33.4**
Copper	700	100	9,000	N/A	**1.6**	**7.0**	**2.2**	**7.0**	**7.9**	**9.3**	**7.2**	**8.5**	**19.4**	**5.4**	**16.2**	**16.4**
Lead	2,700	300	700	N/A	**2.2**	**2.9**	**2.4**	**3.8**	**7.3**	**2.2**	**5.8**	**3.4**	**24.5**	**3.7**	**43**	**16.7**
Nickel	180	560	2,500	N/A	**4.0**	**7.2**	**5.4**	**9.4**	**9.6**	**19.4**	**8.3**	**3.7**	**18.4**	**1.4**	**15.6**	**26.5**
Selenium	2.6	160	1,300	N/A	0.35 J	0.41 J	0.47 J	**0.57**	0.29 J	**1.3**	0.28 J	<0.52	**1.9**	0.27 J	**0.89**	**27.8**
Silver	7.9	160	1,300	N/A	<0.52	<0.53	<0.51	<0.54	<0.51	<0.73	<0.52	<0.53	<0.71	<0.51	<0.56	<0.70
Thallium	89	3	21	N/A	<1.0	<1.1	<1.0	<1.1	<1.0	<1.5	<1.0	<1.1	**2.6**	<1.0	<1.1	1.2 J
Zinc	3,000	8,700	75,000	N/A	**9.9**	**13.3**	**11.1**	**17.7**	**23.5**	**9.6**	**19.1**	**4.6**	**150**	**3.8**	**77.7**	**115**
Mercury	3.3	0.5	1.5	N/A	<0.021	<0.023	<0.019	0.019 J	0.015 J	<0.028	<0.022	<0.020	**0.047**	<0.021	0.010 J	**0.047**

Table 4
Supplemental Phase II Soil Sample Analytical Results
Minnesota Department of Transportation
I 35W, Burnsvile, Minnesota
S.P. 1981-124 (a)

					Boring ID and Sample Depth (in feet bgs)											
	MPCA Screening Soil Leaching Value (b)	**MPCA Tier 1 Soil Reference Value (c)**	**MPCA Tier 2 Soil Reference Value (d)**	**GRO/DRO Criteria (e)**	**DP-33 (4-5) 02/01/18**	**DP-33 (8.5-10) 02/01/18**	**DP-34 (2-3) 02/01/18**	**DP-34 (9-10) 02/01/18**	**DP-35 (2-3) 02/01/18**	**DP-35 (8.5-9.5) 02/01/18**	**DP-36 (4-5) 02/01/18**	**DP-36 (9-10) 02/01/18**	**DP-37 (4-5) 02/01/18**	**DP-37 (8.5-10) 02/01/18**	**DP-38 (4-5) 02/01/18**	**DP-38 (7-8.5) 02/01/18**
Petroleum Hydrocarbons (WI Mod DRO)																
Diesel Range Organics	NE	NE	NE	100	**21**	NA	NA	NA	NA	NA	**21.1**	NA	**49.8**	NA	NA	NA
Priority Pollutant Metals (EPA Methods 6010, 7471, SW7196A)																
Antimory	5.4	12	100	N/A	<1.4	0.51 J	<1.0	<1.3	<1.0	0.13 J	<1.1	<1.0	0.14 J	<1.1	<1.3	<1.1
Arsenic	5.8	9	20	N/A	**17.6**	**1.4**	**2.2**	**2.2**	**3.4**	**2.4**	**1.9**	**2.2**	**2.9**	**2.3**	**3.9**	**2.2**
Beryllium	2.7	55	230	N/A	**2.1**	**0.55**	0.15 J	**0.39**	0.14 J	0.24 J	0.13 J	0.18 J	0.074 J	**0.30**	0.20 J	0.20 J
Cadmium	8.8	25	200	N/A	**1.1**	**0.41**	0.076 J	0.15 J	0.10 J	0.15 J	0.042 J	0.070 J	0.089 J	0.14 J	0.098 J	0.096 J
Chromium, Total	1,000,000,000/36 (f)	44,000/87 (f)	100,000/650 (f)	N/A	**30.4**	**7.8**	**6.1**	**9.8**	**5.9**	**8.3**	**4.6**	**7.2**	**5.7**	**7.3**	**6.8**	**8.8**
Copper	700	100	9,000	N/A	**16.7**	**24.5**	**6.4**	**14.6**	**6.1**	**9.8**	**4.5**	**7.4**	**5.4**	**8.0**	**7.2**	**11.8**
Lead	2,700	300	700	N/A	**24.7**	**7.1**	**11.2**	**6.7**	**4.7**	**8.8**	**3.6**	**5.0**	**3.1**	**65.9**	**5.6**	**3.1**
Nickel	180	560	2,500	N/A	**17**	**15.6**	**8.7**	**29.8**	**9.7**	**11.7**	**7.8**	**8.1**	**7.8**	**8.6**	**11**	**9.2**
Selenium	2.6	160	1,300	N/A	**2.3**	**1.6**	<0.51	<0.64	<0.53	<0.55	<0.52	<0.53	0.29 J	<0.53	0.38 J	<0.56
Silver	7.9	160	1,300	N/A	<0.70	<0.83	<0.51	<0.64	<0.51	<0.55	<0.53	<0.52	<0.51	<0.54	<0.64	<0.57
Thallium	89	3	21	N/A	0.99 J	<1.7	<1.0	<1.3	<1.0	<1.1	<1.1	<1.0	<1.0	<1.1	<1.3	<1.1
Zinc	3,000	8,700	75,000	N/A	**114**	**15.6**	**18.1**	**28.6**	**15.8**	**28.5**	**13.6**	**18.5**	**13.9**	**30.9**	**16.8**	**21.5**
Mercury	3.3	0.5	1.5	N/A	**0.049**	0.022 J	<0.018	**0.025**	<0.021	0.013 J	<0.022	<0.019	<0.022	<0.019	<0.024	<0.022

(a) All results reported in milligrams per kilogram.
MPCA = Minnesota Pollution Control Agency.
DRO = Diesel range organics.
feet bgs = feet below ground surface.
NA = Not analyzed.
N/A = Not applicable.
EPA = U.S. Environmental Protection Agency.
(b) MPCA Screening Soil Leaching Values, updated 2013.
(c) MPCA Tier 1 Residential Soil Reference Values, updated 2009.
(d) MPCA Tier 2 Soil Reference Value for Industrial Exposure, updated 2009.
(e) Evaluation criteria per MPCA Remediation Guidance Document 1-01 Best Management Practices for the Off-Site Reuse of Unregulated Fill, February 2012.
(f) MPCA Soil Leaching Values and Soil Reference Values are for Chromium III and Chromium VI, respectively. Sample concentrations reported as total chromium.
Boldface type denotes a detection above the practical quantitation limit.
Shaded cells indicate exceedance of regulatory criteria, matches respective criteria column shading.
Laboratory Data Qualifiers:
J = Analyte was detected above the method detection limit, but below the practical quantitation limit. Listed value is an estimate.

Table 5
Supplemental Phase II Groundwater Sample Analytical Results
Minnesota Department of Transportation
I 35W, Burnsville, Minnesota
S.P. 1981-124 (a)

	Drinking Water Criteria (b,c)	Sample ID and Date Collected					Sample ID and Date Collected			
		DP-5 11/14/14	DP-6 11/13/14	DP-7 11/13/14	DP-17 11/11/14	DP-24 02/11/18	DP-25 02/12/18	DP-26 02/11/18	DP-27 02/11/18	DP-28 02/11/18
Metals (Dissolved; EPA Methods 6010, 7470)										
Antimony	6 (b)	NA	NA	NA	NA	3.3 J	<20.0	3.2 J	NA	NA
Arsenic	10 (c)	18.6 J	13.2 J	3.2 J	10.7 J	<0.50	0.22 J	**3.2**	NA	NA
Beryllium	0.08 (b)	NA	NA	NA	NA	0.15 J	<5.0	<5.0	NA	NA
Cadmium	0.5 (b)	**4.7**	1.3 J	1.9 J	0.25 J	0.72 J	<3.0	<3.0	NA	NA
Chromium (Total)	20,000/100 (b,d)	**57.7**	**31.2**	**16.6**	**13.9**	<10.0	<10.0	<10.0	NA	NA
Copper	1,300 (c)	NA	NA	NA	NA	3.5 J	2.6 J	2.6 J	NA	NA
Lead	15 (c)	**28.3**	**28.3**	**11.4**	**13.7**	<10.0	<10.0	<10.0	NA	NA
Nickel	100 (b)	NA	NA	NA	NA	**39.0**	12.7 J	15.8 J	NA	NA
Selenium	30 (b)	16.2 J	13.3 J	12.8 J	<20.0	<0.50	<0.50	0.48 J	NA	NA
Silver	30 (b)	<10.0	<10.0	<10.0	<10.0	0.55 J	0.28 J	0.29 J	NA	NA
Thallium	0.6 (b)	NA	NA	NA	NA	8.6 J	6.2 J	8.6 J	NA	NA
Zinc	2000 (b)	NA	NA	NA	NA	3.8 J	2.4 J	2.9 J	NA	NA
Mercury	2 (c)	**1.2**	0.027 J	0.042 J	<0.20	<0.20	<0.20	<0.20	NA	NA
Per- and polyfluorinated alkyl substances (Method DV-LC-0012, PFC-FOSA)										
Perfluorobutane Sulfonate	2 (b)	NA	NA	NA	NA	<0.0200	<0.0223	<0.0229	<0.0206	<0.0192
Perfluorobutyric acid	7 (b)	NA	NA	NA	NA	**0.0380**	**0.0361**	<0.0229	**0.0509**	<0.0192
Perfluorodecane Sulfonate	NE	NA	NA	NA	NA	<0.0200	<0.0223	<0.0229	<0.0206	<0.0192
Perfluorodecanoic acid	NE	NA	NA	NA	NA	<0.0200	<0.0223	<0.0229	<0.0206	<0.0192
Perfluorododecanoic acid	NE	NA	NA	NA	NA	<0.0300	<0.0335	<0.0343	<0.0309	<0.0289
Perfluoroheptanoic acid	NE	NA	NA	NA	NA	<0.0300	<0.0335	<0.0343	<0.0309	<0.0289
Perfluorohexane Sulfonate	NE	NA	NA	NA	NA	<0.0300	<0.0335	<0.0343	<0.0309	<0.0289
Perfluorohexanoic acid	NE	NA	NA	NA	NA	<0.0200	<0.0223	<0.0229	<0.0206	<0.0192
Perfluorononanoic acid	NE	NA	NA	NA	NA	<0.0400	<0.0446	<0.0458	<0.0412	<0.0385
Perfluorooctane Sulfonamide	NE	NA	NA	NA	NA	<0.0524	<0.0611	<0.0597	<0.0486	<0.0513
Perfluorooctane sulfonic acid	0.027 (b)	NA	NA	NA	NA	<0.0300	<0.0335	<0.0343	<0.0309	<0.0289
Perfluorooctanoic acid	0.035 (b)	NA	NA	NA	NA	<0.0200	<0.0223	<0.0229	<0.0206	<0.0192
Perfluoropentanoic acid	NE	NA	NA	NA	NA	<0.0300	<0.0335	<0.0343	<0.0309	<0.0289
Perfluorotetradecanoic acid	NE	NA	NA	NA	NA	<0.0300	<0.0335	<0.0343	<0.0309	<0.0289
Perfluorotridecanoic acid	NE	NA	NA	NA	NA	<0.0400	<0.0446	<0.0458	<0.0412	<0.0385
Perfluoroundecanoic acid	NE	NA	NA	NA	NA	<0.0200	<0.0223	<0.0229	<0.0206	<0.0192

(a) All results reported in micrograms per liter.
MDH = Minnesota Department of Health.
EPA = U.S. Environmental Protection Agency.
NA = not analyzed.
(b) MDH Health Risk Limit or Health Based Value;
Minnesota Administrative Rule 4717.7860 (most conservative exposure duration).
(c) U.S. EPA Maximum Contaminant Level.
(d) MDH Health Risk Limits are for Chromium III and Chromium VI, respectively.
Sample concentrations are reported as total chromium.
Boldface type denotes a detection above the practical quantitation limit.
Indicates a detection in exceedance of the drinking water criterion for that compound.
Laboratory Data Qualifiers:
J = Analyte was detected above the method detection limit, but below the practical quantitation limit.
Listed value is an estimate.

Table 6
Supplemental Phase II Soil Gas Sample Analytical Results
Minnesota Department of Transportation
I-35W, Burnsville, Minnesota
S.P. 1981-124 (a)

			Sample ID, Date Collected, and Sample Interval (feet below ground surface)					
	Industrial Indoor Air ISV	**Lower Explosive Limit (b)**	**SG-1**	**SG-2**	**SG-3**	**SG-4**	**SG-5**	**SG-6**
			02/10/18	**02/12/18**	**02/10/18**	**02/12/18**	**02/12/18**	**02/10/18**
			8 - 10	**8 - 10**	**8 - 10**	**8 - 10**	**8 - 10**	**8 - 10**
Methane (EPA Method TO-3)								
Methane	NE	50,000	**72.1**	**31.4**	**35.7**	**40.4**	**2,020**	**24.3**
VOCs (EPA Method TO-15)								
Acetone	87,000 (c)	NA	**122**	**90.7**	**110**	**133**	**149**	**100**
Benzene	45 (d)	NA	**16.1**	**19**	**18.1**	**9.9**	**5.2**	**10.7**
Benzyl chloride	3 (c)	NA	<1.9	<1.8	<1.8	<1.7	<1.8	<1.9
Bromodichloromethane	NE	NA	<2.4	<2.4	<2.4	<2.2	<2.3	<2.4
Bromoform	30 (c)	NA	<9.3	<9.1	<9.1	<8.6	<8.8	<9.5
Bromomethane	10 (c)	NA	<1.4	<1.4	<1.4	<1.3	<1.3	<1.4
1,3-Butadiene	2.7 (d)	NA	<2.0	<2.0	<2.0	<1.8	<1.9	<2.0
2-Butanone (MEK)	10,000 (c)	NA	**26.7**	**30**	**29.4**	**18.4**	**78.4**	**22.4**
Carbon disulfide	2,000 (c)	NA	<1.1	**10**	<1.1	<1.0	<1.1	**6.7**
Carbon tetrachloride	16 (d)	NA	<1.1	<1.1	<1.1	<1.0	<1.1	<1.2
Chlorobenzene	180 (d)	NA	<1.7	<1.6	1.2 J	<1.5	<1.6	<1.7
Chloroethane	30,000 (c)	NA	<2.4	<2.3	<2.3	<2.2	<2.3	<2.4
Chloroform	300 (c)	NA	<0.88	<0.86	<0.86	<0.81	<0.83	<0.89
Chloromethane	300 (c)	NA	<0.74	<0.73	<0.73	<0.68	<0.71	<0.76
Cyclohexane	20,000 (c)	NA	**10.0**	**9.0**	<1.2	<1.1	<1.2	<1.3
Dibromochloromethane	NE	NA	<3.1	<3.0	<3.0	<2.8	<2.9	<3.1
1,2-Dibromoethane (EDB)	0.16 (d)	NA	<2.8	<2.7	<2.7	<2.5	<2.6	<2.8
1,2-Dichlorobenzene	600 (c)	NA	<2.2	<2.1	<2.1	<2.0	<2.0	<2.2
1,3-Dichlorobenzene	NE	NA	<2.2	<2.1	<2.1	<2.0	<2.0	<2.2
1,4-Dichlorobenzene	200 (c)	NA	<2.2	<2.1	<2.1	<2.0	<2.0	<2.2
Dichlorodifluoromethane (Freon 12)	1,000 (c)	NA	<1.8	<1.8	<1.8	<1.6	<1.7	<1.8
1,1-Dichloroethane	1 (c)	NA	<1.5	<1.4	<1.4	<1.3	<1.4	<1.5
1,2-Dichloroethane	3.8 (d)	NA	<0.73	<0.72	<0.72	<0.67	<0.69	<0.74
1,1-Dichloroethene	NE	NA	<1.4	<1.4	<1.4	<1.3	<1.4	<1.5
cis-1,2-Dichloroethene	NE (d)	NA	<1.4	<1.4	<1.4	<1.3	<1.4	<1.5
trans-1,2-Dichloroethene	NE (d)	NA	<1.4	<1.4	<1.4	<1.3	<1.4	<1.5
1,2-Dichloropropane	10 (c)	NA	<1.7	<1.6	<1.6	<1.5	<1.6	<1.7
cis-1,3-Dichloropropene	60 (c)	NA	<1.6	<1.6	<1.6	<1.5	<1.6	<1.7
trans-1,3-Dichloropropene	60 (c)	NA	<1.6	<1.6	<1.6	<1.5	<1.6	<1.7
Dichlorotetrafluoroethane	NE	NA	<2.5	<2.5	<2.5	<2.3	<2.4	<2.6
Ethanol	42,000 (c)	NA	**17.1**	<3.3	<3.3	**24.0**	<3.2	<3.4
Ethyl acetate	8,000 (c)	NA	<1.3	<1.3	<1.3	<1.2	<1.2	<1.3
Ethylbenzene	39 (d)	NA	**5.5**	**2.4**	**9.2**	**3.3**	**2.2**	**3.4**
4-Ethyltoluene	NE	NA	<1.8	<1.7	<1.7	<1.6	<1.7	<1.8
n-Heptane	NE	NA	**12.3**	**12.4**	**13.9**	**6.6**	**5.9**	**6.2**
Hexachloro-1,3,-butadiene	1 (c)	NA	<3.8	<3.8	<3.8	<3.5	<3.6	<3.9
n-Hexane	6,000 (c)	NA	**34.7**	**28.7**	**27.7**	**38.3**	**16.0**	**13.1**
2-Hexanone	110 (d)	NA	<7.4	<7.2	<7.2	<6.8	<7.0	<7.5
Methylene Chloride (dichloromethane)	2,100 (d)	NA	**77.9**	<6.1	<6.1	**118**	<5.9	<6.4
4-Methyl-2-pentanone (MIBK)	8,000 (c)	NA	<7.4	<7.2	<7.2	<6.8	<7.0	<7.5
Methyl tert-butyl ether	8,000 (c)	NA	<6.5	<6.4	<6.4	<6.0	<6.1	<6.6
Naphthalene	30 (c)	NA	<4.7	<4.6	<4.6	<4.3	<4.5	<4.8
2-Propanol	20,000 (c)	NA	**6.8**	<4.4	<4.4	<4.1	<4.2	**7.8**
Propylene	8,000 (c)	NA	<0.62	**460**	**380**	<0.57	<0.59	**237**
Styrene	3,000 (c)	NA	<1.5	<1.5	<1.5	<1.4	<1.5	<1.6
1,1,2,2-Tetrachloroethane	1 (c)	NA	<1.2	<1.2	<1.2	<1.1	<1.2	<1.3
Tetrachloroethene	33 (d)	NA	<1.2	**1.5**	<1.2	<1.1	<1.2	<1.2
Tetrahydrofuran	NE	NA	<1.1	<1.0	<1.0	<0.98	<1.0	<1.1
Toluene	18,000 (d)	NA	**28.4**	**13**	**25.9**	**14.0**	**6.6**	**28.9**
1,2,4-Trichlorobenzene	10 (c)	NA	<6.7	<6.6	<6.6	<6.1	<6.3	<6.8
1,1,1-Trichloroethane	10,000 (c)	NA	<2.0	<1.9	<1.9	<1.8	<1.9	<2.0
1,1,2-Trichloroethane	2 (c)	NA	<0.98	<0.97	<0.97	<0.90	<0.93	<1.0
Trichloroethene	7.0 (d)	NA	<0.97	<0.95	<0.95	<0.89	<0.92	<0.98
Trichlorofluoromethane (Freon 11)	2,000 (c)	NA	<2.0	<2.0	<2.0	<1.9	<1.9	<2.1
1,1,2-Trichlorotrifluoroethane (Freon	80,000 (c)	NA	<2.8	<2.7	<2.7	<2.5	<2.6	<2.8
1,2,4-Trimethylbenzene	210 (d)	NA	1.5 J	<1.7	1.0 J	<1.6	<1.7	0.96 J
1,3,5-Trimethylbenzene	210 (d)	NA	<1.8	<1.7	<1.7	<1.6	<1.7	<1.8
Vinyl acetate	600 (c)	NA	<1.3	<1.2	<1.2	<1.2	<1.2	<1.3
Vinyl chloride	22 (d)	NA	<2.3	<2.3	<2.3	<2.1	<2.2	<2.3
m&p-Xylene	350 (d)	NA	**6.0**	**3.1**	**18.5**	2.8 J	**3.1**	**5.2**
o-Xylene	350 (d)	NA	1.3 J	<1.5	**9.4**	<1.4	<1.5	<1.6

Table 6
Supplemental Phase II Soil Gas Sample Analytical Results
Minnesota Department of Transportation
I-35W, Burnsville, Minnesota
S.P. 1981-124 (a)

			Sample ID, Date Collected, and Sample Interval (feet below ground surface)					
	Industrial Indoor Air ISV	**Lower Explosive Limit (b)**	**SG-7**	**SG-8**	**SG-9**	**SG-10**	**SG-11**	**SG-12**
			02/10/18	**02/10/18**	**02/10/18**	**02/11/18**	**02/10/18**	**02/11/18**
			8 - 10	**8 - 10**	**8 - 10**	**8 - 10**	**8 - 10**	**8 - 10**
Methane (EPA Method TO-3)								
Methane	NE	50,000	**27.3**	**26.9**	**5,390**	**1,560**	**61.9**	**95,600**
VOCs (EPA Method TO-15)								
Acetone	87,000 (c)	NA	**49.6**	**88.4**	**155**	**72.9**	**119**	**109**
Benzene	45 (d)	NA	**26.5**	**10.3**	**23.2**	**8.3**	**12.9**	**28.9**
Benzyl chloride	3 (c)	NA	<1.8	<1.8	<1.9	<1.8	<1.8	<1.8
Bromodichloromethane	NE	NA	<2.3	<2.4	<2.4	<2.3	<2.3	<2.4
Bromoform	30 (c)	NA	<8.8	<9.1	<9.5	<8.8	<8.8	<9.1
Bromomethane	10 (c)	NA	<1.3	<1.4	<1.4	<1.3	<1.3	<1.4
1,3-Butadiene	2.7 (d)	NA	<1.9	<2.0	<2.0	<1.9	<1.9	<2.0
2-Butanone (MEK)	10,000 (c)	NA	**9.6**	**19.7**	**35.5**	**24.4**	**25.8**	**29.9**
Carbon disulfide	2,000 (c)	NA	<1.1	<1.1	<1.1	**7.4**	**7.4**	**37.5**
Carbon tetrachloride	16 (d)	NA	<1.1	<1.1	<1.2	<1.1	<1.1	<1.1
Chlorobenzene	180 (d)	NA	<1.6	<1.6	<1.7	<1.6	<1.6	<1.6
Chloroethane	30,000 (c)	NA	<2.3	<2.3	<2.4	<2.3	<2.3	<2.3
Chloroform	300 (c)	NA	<0.83	<0.86	<0.89	<0.83	<0.83	<0.86
Chloromethane	300 (c)	NA	<0.71	<0.73	<0.76	<0.71	<0.71	<0.73
Cyclohexane	20,000 (c)	NA	**15.9**	<1.2	**23.0**	<1.2	<1.2	**90.6**
Dibromochloromethane	NE	NA	<2.9	<3.0	<3.1	<2.9	<2.9	<3.0
1,2-Dibromoethane (EDB)	0.16 (d)	NA	<2.6	<2.7	<2.8	<2.6	<2.6	<2.7
1,2-Dichlorobenzene	600 (c)	NA	<2.0	<2.1	<2.2	<2.0	<2.0	<2.1
1,3-Dichlorobenzene	NE	NA	<2.0	<2.1	<2.2	<2.0	<2.0	<2.1
1,4-Dichlorobenzene	200 (c)	NA	<2.0	<2.1	<2.2	<2.0	<2.0	<2.1
Dichlorodifluoromethane (Freon 12)	1,000 (c)	NA	<1.7	<1.8	<1.8	<1.7	<1.7	<1.8
1,1-Dichloroethane	1 (c)	NA	<1.4	<1.4	<1.5	<1.4	<1.4	<1.4
1,2-Dichloroethane	3.8 (d)	NA	<0.69	<0.72	<0.74	<0.69	<0.69	<0.72
1,1-Dichloroethene	NE	NA	<1.4	<1.4	<1.5	<1.4	<1.4	<1.4
cis-1,2-Dichloroethene	NE (d)	NA	<1.4	<1.4	<1.5	<1.4	<1.4	<1.4
trans-1,2-Dichloroethene	NE (d)	NA	<1.4	<1.4	<1.5	<1.4	<1.4	<1.4
1,2-Dichloropropane	10 (c)	NA	<1.6	<1.6	<1.7	<1.6	<1.6	<1.6
cis-1,3-Dichloropropene	60 (c)	NA	<1.6	<1.6	<1.7	<1.6	<1.6	<1.6
trans-1,3-Dichloropropene	60 (c)	NA	<1.6	<1.6	<1.7	<1.6	<1.6	<1.6
Dichlorotetrafluoroethane	NE	NA	<2.4	<2.5	<2.6	<2.4	<2.4	<2.5
Ethanol	42,000 (c)	NA	<3.2	<3.3	**36.8**	<3.2	<3.2	<3.3
Ethyl acetate	8,000 (c)	NA	<1.2	<1.3	<1.3	<1.2	<1.2	<1.3
Ethylbenzene	39 (d)	NA	**16.6**	**3.7**	**19.7**	**1.6**	**4.3**	**3.7**
4-Ethyltoluene	NE	NA	<1.7	<1.7	<1.8	<1.7	<1.7	<1.7
n-Heptane	NE	NA	**17.6**	**6.6**	**27.7**	**6.7**	**9.2**	**37.8**
Hexachloro-1,3,-butadiene	1 (c)	NA	<3.6	<3.8	<3.9	<3.6	<3.6	<3.8
n-Hexane	6,000 (c)	NA	**34.5**	**15.7**	**52.0**	**16.0**	**21.9**	**111**
2-Hexanone	110 (d)	NA	<7.0	<7.2	<7.5	<7.0	<7.0	<7.2
Methylene Chloride (dichloromethane)	2,100 (d)	NA	<5.9	<6.1	<6.4	<5.9	<5.9	<6.1
4-Methyl-2-pentanone (MIBK)	8,000 (c)	NA	<7.0	<7.2	<7.5	<7.0	<7.0	<7.2
Methyl tert-butyl ether	8,000 (c)	NA	<6.1	<6.4	<6.6	<6.1	<6.1	<6.4
Naphthalene	30 (c)	NA	<4.5	<4.6	<4.8	<4.5	<4.5	<4.6
2-Propanol	20,000 (c)	NA	<4.2	**6.7**	<4.5	<4.2	**8.1**	<4.4
Propylene	8,000 (c)	NA	**265**	**264**	**275**	**180**	**323**	<0.61
Styrene	3,000 (c)	NA	<1.5	<1.5	<1.6	<1.5	<1.5	<1.5
1,1,2,2-Tetrachloroethane	1 (c)	NA	<1.2	<1.2	<1.3	<1.2	<1.2	<1.2
Tetrachloroethene	33 (d)	NA	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Tetrahydrofuran	NE	NA	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0
Toluene	18,000 (d)	NA	**37.0**	**32.0**	**54.9**	**9.7**	**34.7**	**32.9**
1,2,4-Trichlorobenzene	10 (c)	NA	<6.3	<6.6	<6.8	<6.3	<6.3	<6.6
1,1,1-Trichloroethane	10,000 (c)	NA	<1.9	<1.9	<2.0	<1.9	<1.9	<1.9
1,1,2-Trichloroethane	2 (c)	NA	<0.93	<0.97	<1.0	<0.93	<0.93	<0.97
Trichloroethene	7.0 (d)	NA	<0.92	<0.95	<0.98	<0.92	<0.92	<0.95
Trichlorofluoromethane (Freon 11)	2,000 (c)	NA	<1.9	<2.0	<2.1	<1.9	<1.9	<2.0
1,1,2-Trichlorotrifluoroethane (Freon	80,000 (c)	NA	<2.6	<2.7	<2.8	<2.6	<2.6	<2.7
1,2,4-Trimethylbenzene	210 (d)	NA	1.4 J	<1.7	1.3 J	<1.7	0.95 J	<1.7
1,3,5-Trimethylbenzene	210 (d)	NA	<1.7	<1.7	<1.8	<1.7	<1.7	<1.7
Vinyl acetate	600 (c)	NA	<1.2	<1.2	<1.3	<1.2	<1.2	<1.2
Vinyl chloride	22 (d)	NA	<2.2	<2.3	<2.3	<2.2	<2.2	<2.3
m&p-Xylene	350 (d)	NA	**6.7**	**5.4**	**9.2**	2.9 J	**7.1**	**7.3**
o-Xylene	350 (d)	NA	1.3 J	<1.5	**2.1**	<1.5	0.78 J	**1.7**

Table 6
Supplemental Phase II Soil Gas Sample Analytical Results
Minnesota Department of Transportation
I-35W, Burnsville, Minnesota
S.P. 1981-124 (a)

			Sample ID, Date Collected, and Sample Interval (feet below ground surface)			
	Industrial Indoor Air ISV	**Lower Explosive Limit (b)**	**SG-13**	**SG-14**	**SG-15**	**SG-16**
			02/10/18	**02/11/18**	**02/10/18**	**02/10/18**
			8 - 10	**8 - 10**	**8 - 10**	**8 - 10**
Methane (EPA Method TO-3)						
Methane	NE	50,000	**1,580**	**9,220**	**7,240**	**23,900**
VOCs (EPA Method TO-15)						
Acetone	87,000 (c)	NA	**138**	**428**	**105**	**523**
Benzene	45 (d)	NA	**3.3**	**14.6**	**25.8**	**55.7**
Benzyl chloride	3 (c)	NA	<1.9	<1.9	<2.0	<1.7
Bromodichloromethane	NE	NA	<2.4	<2.4	<2.6	<2.2
Bromoform	30 (c)	NA	<9.3	<9.3	<10.2	<8.6
Bromomethane	10 (c)	NA	<1.4	<1.4	<1.5	<1.3
1,3-Butadiene	2.7 (d)	NA	<2.0	<2.0	<2.2	<1.8
2-Butanone (MEK)	10,000 (c)	NA	**11.3**	**82.1**	**23.7**	**145**
Carbon disulfide	2,000 (c)	NA	<1.1	**12.8**	**15.7**	**56.3**
Carbon tetrachloride	16 (d)	NA	<1.1	<1.1	<1.2	<1.0
Chlorobenzene	180 (d)	NA	<1.7	<1.7	<1.8	<1.5
Chloroethane	30,000 (c)	NA	<2.4	<2.4	<2.6	**79.0**
Chloroform	300 (c)	NA	<0.88	<0.88	<0.96	<0.81
Chloromethane	300 (c)	NA	<0.74	<0.74	<0.81	<0.68
Cyclohexane	20,000 (c)	NA	<1.2	<1.2	<1.4	**388**
Dibromochloromethane	NE	NA	<3.1	<3.1	<3.4	<2.8
1,2-Dibromoethane (EDB)	0.16 (d)	NA	<2.8	<2.8	<3.0	<2.5
1,2-Dichlorobenzene	600 (c)	NA	<2.2	<2.2	<2.4	<2.0
1,3-Dichlorobenzene	NE	NA	<2.2	<2.2	<2.4	<2.0
1,4-Dichlorobenzene	200 (c)	NA	<2.2	<2.2	<2.4	<2.0
Dichlorodifluoromethane (Freon 12)	1,000 (c)	NA	<1.8	<1.8	<2.0	<1.6
1,1-Dichloroethane	1 (c)	NA	<1.5	<1.5	<1.6	<1.3
1,2-Dichloroethane	3.8 (d)	NA	<0.73	<0.73	<0.80	<0.67
1,1-Dichloroethene	NE	NA	<1.4	<1.4	<1.6	<1.3
cis-1,2-Dichloroethene	NE (d)	NA	<1.4	<1.4	<1.6	<1.3
trans-1,2-Dichloroethene	NE (d)	NA	<1.4	<1.4	<1.6	<1.3
1,2-Dichloropropane	10 (c)	NA	<1.7	<1.7	<1.8	<1.5
cis-1,3-Dichloropropene	60 (c)	NA	<1.6	<1.6	<1.8	<1.5
trans-1,3-Dichloropropene	60 (c)	NA	<1.6	<1.6	<1.8	<1.5
Dichlorotetrafluoroethane	NE	NA	<2.5	<2.5	<2.8	<2.3
Ethanol	42,000 (c)	NA	**40.0**	<3.4	<3.7	**60.5**
Ethyl acetate	8,000 (c)	NA	<1.3	<1.3	<1.4	<1.2
Ethylbenzene	39 (d)	NA	**2.6**	**2.9**	**3.6**	**8.7**
4-Ethyltoluene	NE	NA	<1.8	<1.8	<1.9	<1.6
n-Heptane	NE	NA	**3.2**	**16.5**	**13.0**	**157**
Hexachloro-1,3,-butadiene	1 (c)	NA	<3.8	<3.8	<4.2	<3.5
n-Hexane	6,000 (c)	NA	<1.3	**30.0**	**30.6**	**506**
2-Hexanone	110 (d)	NA	<7.4	<7.4	<8.1	<6.8
Methylene Chloride (dichloromethane)	2,100 (d)	NA	<6.2	<6.2	<6.8	<5.8
4-Methyl-2-pentanone (MIBK)	8,000 (c)	NA	<7.4	<7.4	4.9 J	**16.4**
Methyl tert-butyl ether	8,000 (c)	NA	<6.5	<6.5	<7.1	<6.0
Naphthalene	30 (c)	NA	<4.7	<4.7	<5.2	<4.3
2-Propanol	20,000 (c)	NA	**20.9**	<4.4	**8.7**	<4.1
Propylene	8,000 (c)	NA	<0.62	<0.62	**432**	**1,460**
Styrene	3,000 (c)	NA	<1.5	<1.5	<1.7	<1.4
1,1,2,2-Tetrachloroethane	1 (c)	NA	<1.2	<1.2	<1.4	<1.1
Tetrachloroethene	33 (d)	NA	**6.6**	<1.2	<1.3	<1.1
Tetrahydrofuran	NE	NA	<1.1	<1.1	<1.2	<0.98
Toluene	18,000 (d)	NA	**20.9**	**17.8**	**24.2**	**139**
1,2,4-Trichlorobenzene	10 (c)	NA	<6.7	<6.7	<7.3	<6.1
1,1,1-Trichloroethane	10,000 (c)	NA	<2.0	<2.0	<2.2	<1.8
1,1,2-Trichloroethane	2 (c)	NA	<0.98	<0.98	<1.1	<0.90
Trichloroethene	7.0 (d)	NA	<0.97	<0.97	<1.1	<0.89
Trichlorofluoromethane (Freon 11)	2,000 (c)	NA	<2.0	<2.0	<2.2	<1.9
1,1,2-Trichlorotrifluoroethane (Freon	80,000 (c)	NA	<2.8	<2.8	<3.0	<2.5
1,2,4-Trimethylbenzene	210 (d)	NA	0.98 J	0.90 J	**3.0**	**3.8**
1,3,5-Trimethylbenzene	210 (d)	NA	<1.8	<1.8	<1.9	1.2 J
Vinyl acetate	600 (c)	NA	<1.3	**8.6**	<1.4	<1.2
Vinyl chloride	22 (d)	NA	<2.3	<2.3	<2.5	<2.1
m&p-Xylene	350 (d)	NA	**6.1**	**6.7**	**10.0**	**15.5**
o-Xylene	350 (d)	NA	<1.6	1.0 J	**2.0**	**4.5**

Table 6
Supplemental Phase II Soil Gas Sample Analytical Results
Minnesota Department of Transportation
I-35W, Burnsville, Minnesota
S.P. 1981-124 (a)

(a) Methane results reported in parts per million by volume.
All VOCs results reported in micrograms per cubic meter.
ISV = Intrusion Screening Value.
EPA = U.S. Environmental Protection Agency.
NE = not established.
VOCs = volatile organic compounds.
MPCA = Minnesota Pollution Control Agency.

(b) Lower Explosive Limit for methane shown as parts per million by volume.

(c) MPCA Interim ISV, updated February 2009 (used where no 2017 values are available).

(d) MPCA Interim ISV, updated February 2017 (Guidance Document c-rem3-12).

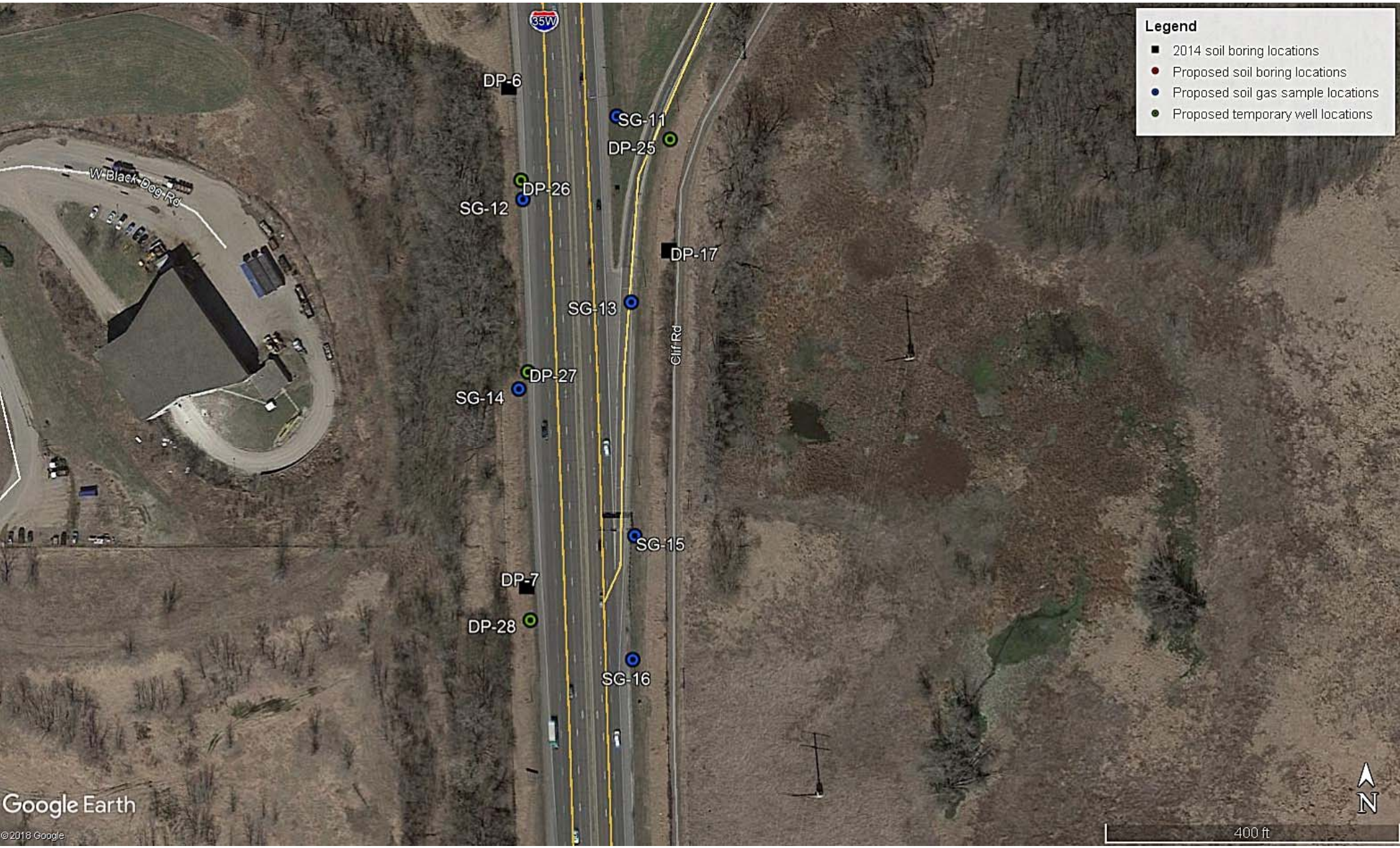
Bold values indicate a detection above the practical quantitation limit (PQL).

Shaded cells indicate exceedance of regulatory criteria, matching respective criteria column colorin

APPENDIX

A SUPPLEMENTAL PHASE II INVESTIGATION WORK PLAN


Legend
2014 soil boring locations
Proposed soil boring locations
Proposed soil gas sample locations
Proposed temporary well locations
W Black Dog Rd
Cliff Rd
SG-1
SG-2
DP-18
SG-3
DP-19
SG-4
DP-20
SG-5
SG-6
SG-7
SG-8
DP-21
DP-22
DP-24
SG-10
35W
SG-9
DP-23
DP-6
Google Earth
©2018 Google
N
400 ft


Legend
2014 soil boring locations
Proposed soil boring locations
Proposed soil gas sample locations
Proposed temporary well locations
35W
DP-6
SG-11
DP-25
W Black Dog Rd
DP-26
SG-12
DP-17
SG-13
Cliff Rd
DP-27
SG-14
SG-15
DP-7
DP-28
SG-16
Google Earth
©2018 Google
N
400 ft


DP-16
35W
DP-29
DP-8
DP-30
DP-34
DP-15
DP-35
DP-31
Cliff Rd
DP-36
DP-32
DP-9
DP-33
DP-37
Embassy Rd
DP-14
DP-38
DP-10
Google Earth
© 2018 Google
N
900 ft

Table 1

Proposed Supplemental Phase II Sampling Plan - Soil and Groundwater Sampling
Minnesota Department of Transportation
I-35W at Minnesota River Bridge
Burnsville, Minnesota
S.P. 1981-124 (a)

Boring I.D. (b)	Location	Justification	Boring Depth (fbg)	Soil Sample Depth (c)	Soil Analyses	Groundwater Analyses
DP-18	Exit ramp shoulder from southbound I-35W to Black Dog Road. Co-located with SG-2	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-19	North shoulder of Black Dog Road entrance ramp to southbound I-35W. Co-located with SG-4	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-20	South shoulder of Black Dog Road entrance ramp to southbound I-35W. Co-located with SG-5	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-21	South shoulder of Black Dog Road entrance ramp to northbound I-35W. Co-located with SG-8.	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-22	South shoulder of Black Dog Road entrance ramp to northbound I-35W.	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-23	East shoulder of Black Dog Road exit ramp from northbound I-35W. Co-located with SG-9	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-24	Southbound I-35W shoulder, approx. 280 feet south of Black Dog Road entrance ramp. Co-located with SG-10.	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Groundwater or bedrock, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	Priority pollutant metals (field filtered), PFC using Method DV-LC-0012
DP-25	East shoulder of Black Dog Road exit ramp from northbound I-35W approx 245 feet south of DP-23	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Groundwater or bedrock, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	Priority pollutant metals (field filtered), PFC using Method DV-LC-0012
DP-26	Southbound I-35W shoulder, approx. 300 feet south of DP-24. Co-located with SG-12.	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Groundwater or bedrock, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	Priority pollutant metals (field filtered), PFC using Method DV-LC-0012

Table 1

Proposed Supplemental Phase II Sampling Plan - Soil and Groundwater Sampling
Minnesota Department of Transportation
I-35W at Minnesota River Bridge
Burnsville, Minnesota
S.P. 1981-124 (a)

Boring I.D. (b)	Location	Justification	Boring Depth (fbg)	Soil Sample Depth (c)	Soil Analyses	Groundwater Analyses
DP-27	Southbound I-35W shoulder, approx. 250 feet south of DP-26. Co-located with SG-14	Provide additional soil evaluation at northern end of construction work, adjacent to landfill area	Groundwater or bedrock, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	PFC using Method DV-LC-0012
DP-28	Southbound I-35W shoulder, approx. 330 feet south of DP-27. Co-located with SG-14	Provide information regarding the potential presence and magnitude of PFCs in groundwater adjacent to landfill area	Groundwater or bedrock, whichever is shallower	NA	NA	PFC using Method DV-LC-0012
DP-29	Adjacent to muti-use trail parallel to the east side of I-35W, approximately 1,330 feet north of trail entrance	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-30	Adjacent to muti-use trail parallel to the east side of I-35W, approximately 180 feet south of DP-29	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-31	Adjacent to muti-use trail parallel to the east side of I-35W, approximately 250 feet south of DP-30	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 4-5 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-32	Adjacent to muti-use trail parallel to the east side of I-35W, approximately 175 feet south of DP-31	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 4-5 fbg, and base of boring. DRO sample from highest evidence of impact or 4-5 fbg.	Priority pollutant metals (EPA 6010B/7471A), DRO (silica gel cleanup)	NA
DP-33	Adjacent to muti-use trail parallel to the east side of I-35W, approximately 180 feet south of DP-32	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 4-5 fbg, and base of boring. DRO sample from highest evidence of impact or 4-5 fbg.	Priority pollutant metals (EPA 6010B/7471A), DRO (silica gel cleanup)	NA

Table 1

Proposed Supplemental Phase II Sampling Plan - Soil and Groundwater Sampling
Minnesota Department of Transportation
I-35W at Minnesota River Bridge
Burnsville, Minnesota
S.P. 1981-124 (a)

Boring I.D. (b)	Location	Justification	Boring Depth (fbg)	Soil Sample Depth (c)	Soil Analyses	Groundwater Analyses
DP-34	Adjacent to unpaved road parallel to the west side of I-35W, approx. 130 feet south of road termius (south of DP-8)	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-35	Adjacent to unpaved road parallel to the west side of I-35W, approx. 190 feet south of DP-34	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 2-3 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA
DP-36	Adjacent to unpaved road parallel to the west side of I-35W, approx. 200 feet south of DP-35	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 4-5 fbg, and base of boring. DRO sample from highest evidence of impact or 4-5 fbg.	Priority pollutant metals (EPA 6010B/7471A), DRO (silica gel cleanup)	NA
DP-37	Adjacent to unpaved road parallel to the west side of I-35W, approx. 275 feet south of DP-36	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 4-5 fbg, and base of boring. DRO sample from highest evidence of impact or 4-5 fbg.	Priority pollutant metals (EPA 6010B/7471A), DRO (silica gel cleanup)	NA
DP-38	Adjacent to unpaved road parallel to the west side of I-35W, approx. 215 feet south of DP-37	Provide additional soil evaluation at southern end of construction work, adjacent to landfill area	10 fbg or groundwater, whichever is shallower	Highest evidence of impact or 4-5 fbg, and base of boring.	Priority pollutant metals (EPA 6010B/7471A)	NA

a\ fbg = feet below grade. NA = not applicable.
DRO = diesel range organic compounds.

b\ Soil boring identification number and locations may change as determined by field observations and conditions.

c\ Not all samples may not be analyzed pending discussion with MnDOT.

APPENDIX

B APPLICABLE WSP STANDARD OPERATING PROCEDURES

FIELD STANDARD OPERATING PROCEDURE #4

SAMPLE COLLECTION AND QUALITY ASSURANCE PROCEDURE

The purpose of this procedure is to assure that sample volumes and preservatives are sufficient for analytical services required under U.S. Environmental Protection Agency (EPA) or other agency approved protocols. This operating procedure describes sample identification procedures, sampling order for select analytes, quality control and quality assurance (QA/QC) sampling procedures, and custody documentation for environmental sampling. The user is advised to read the entire standard operating procedure (SOP) and review the site health and safety plan (HASP) before beginning any onsite activities. In accordance with the HASP, proper personal protective equipment (PPE) must be selected and used appropriately.

4.1 ACRONYMS AND ABBREVIATIONS

ºC	Degrees Celsius
COC	Chain-of–custody [form]
DI	Deionized water
DOT	U.S. Department of Transportation
EDD	Electronic data deliverable
EPA	U.S. Environmental Protection Agency
HASP	Health and safety plan
ID	Identification [number]
MS/MSD	Matrix spike and matrix spike duplicate
MSA	Master Services Agreement
PPE	Personal protective equipment
QA	Quality assurance
QA/QC	Quality assurance/quality control
QAPP	Quality assurance project plan
SOP	Standard operating procedure
VOCs	Volatile organic compounds

4.2 MATERIALS

- Field book
- Indelible (waterproof) markers or pens
- PPE
- Sample containers
- Sample labels
- Clear tape
- Deionized (DI) water
- Cleaned or dedicated sampling equipment

4.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's USA Corp. Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

This SOP is written for the sole use of employees and will be revised periodically to reflect updates to company policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company's SOPs. Employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

This SOP is designed to provide the user with a general outline for collecting environmental and quality assurance samples and assumes the user is familiar with basic field procedures, such as recording field notes (SOP 1), sample shipment procedures (SOP 3), investigation derived waste management procedures (SOP 5), and equipment decontamination (SOP 6). This SOP does not cover investigation planning, nor does it cover the analysis of the analytical results. These topics are more appropriately addressed in a site-specific work plan or a dedicated quality assurance project plan (QAPP).

4.4 SAMPLE IDENTIFICATION PROCEDURES

Information on the sample container labels must include the site/project name, project/task number, unique alpha-numeric sample identification (ID) number, sample collection date, time of collection using the military or 24-hour clock system (i.e., 0000 to 2400 hours), analytical parameters, preservative, and the initials of the sampling personnel. Employees are advised to use pre-printed waterproof mailing labels (e.g., Avery® 5xxx-series Waterproof Address Labels) for all sample identification. Label templates are available.

The sample identification (ID) number must, unless otherwise approved by your project manager or specified in your site-specific work plan, follow the company's naming protocol. This protocol was developed to aid in determining the type of sample collected (e.g., soil, groundwater, vapor, etc.), the sample location, and, where appropriate, the sample depth. The protocol was also designed to ensure consistency across the company.

Construct sample IDs in the following format:

SB-10A (4-6)

Where, in this example:

- SB = the first two or three characters will define the sample type (see list of approved prefixes below); in this case, a soil boring
- 10A = the next two or three alpha-numeric digits (separated by a dash from the sample type identifier) indicate the location of the boring on the site; in this case, boring number 10A
- (4-6) = the depth the sample was collected, with the first number (including decimals, if necessary) indicating the top of the sample interval (in feet) and the second number indicating the bottom of the sample interval (in feet); not all sample types will include depth information.

Additional label information may be added after the last character of the sample ID number (e.g., sample date, underground storage tank number, area of concern number, "Area" number, client identifier, etc.). Separate any additional information from the required portion of the sample name by dash(es).

Sample Prefix	Permitted Use
AA	Ambient outdoor air sample
CC	Concrete core/chip sample
CS	Confirmation/verification soil sample collected from an excavation
HA	Soil sample collected with a hand auger

Sample Prefix	Permitted Use
IAB	Indoor air sample – basement
IAC	Indoor air sample – crawl space
IAF	Indoor air sample – first floor
MW	Soil sample collected from a monitoring well borehole or a groundwater sample collected from a monitoring well
PZ	Groundwater sample collected from a piezometer
SB	Soil sample collected from boreholes that will not be converted to monitoring wells
SED	Sediment sample
SG	Soil gas sample other than a sub-slab sample (e.g., sample collected from a temporary or permanent polyvinyl chloride sample point or stainless steel screen implant)
SL	Sludge sample
SS	Surface soil sample collected using hand tools (e.g., trowel, spoon, etc.) and typically at depths less than 2 feet below ground surface
SSV	Sub-slab vapor sample
SW	Surface water sample
TC	Tree core sample
TP	Soil sample collected from a test pit
WC	Waste characterization sample
WP	Wipe sample
WW	Wastewater

4.5 SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

The first step in sample collection is to verify that the analytical laboratory has provided the correct number and type of sample containers and each contains the appropriate preservatives for the proposed project (i.e., check against the sampling plan requirements outlined in the site-specific QAPP or, for those projects without a site-specific QAPP, the laboratory Task Order). Inspect all containers and lids for flaws (cracks, chips, etc.) before use. Do not use any container with visible defects or discoloration. Report any discrepancies, or non-receipt, of specific types of sample containers to the team leader or project manager immediately. Make arrangements with the laboratory to immediately ship missing or additional sampling containers.

Precautions must be taken to prevent cross-contamination and contamination of the environment when collecting samples. Wear a clean pair of new, disposable gloves each time a different sample is collected and don the gloves immediately prior to sampling. The gloves must not come in contact with the medium being sampled and must be changed any time during sample collection when their cleanliness is compromised. Sample collection must follow all appropriate SOPs, state and federal regulations, or guidance, for the collection of environmental samples; the recommended order of sample collection is:

- Geochemical measurements (e.g., temperature, pH, specific conductance)
- Volatile organic compounds (VOCs)
- Extractable organics, petroleum hydrocarbons, aggregate organics, and oil and grease
- Total metals
- Dissolved metals
- Inorganic non-metallic and physical and aggregate properties
- Microbiological samples
- Radionuclides

Collected samples that require thermal preservation must be immediately (within 15 minutes) placed in a cooler with wet ice and maintained at a preservation temperature of 4° Celsius (°C).

4.6 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Field quality assurance/quality control (QA/QC) samples include equipment blanks, trip blanks, duplicates, and split samples. The project manager or QAPP must specify the type and frequency of QA/QC sample collection. The QA/QC sample identification number must, unless otherwise approved by your project manager or specified in your site-specific work plan, follow the company's naming protocol as discussed in the sections below. QA/QC samples must be clearly identified on our copy of the COC form and in the field book. Failure to properly collect and submit required QA/QC samples can result in invalidation of an entire sampling event.

Collect, preserve, transport and document split samples using the same protocols as the related samples.

4.6.1 EQUIPMENT BLANKS

Equipment blanks are used to document contamination attributable to using non-dedicated equipment (i.e., equipment that must be decontaminated after each use). Collect equipment blanks in the field at a rate of one per type of sampling equipment per day, unless otherwise specified. If the site-specific work plan or QAPP indicates that an equipment blank is to be collected from dedicated sampling equipment, collect the equipment blank in the field before sampling begins. If field decontamination of sampling equipment is required, prepare the equipment blanks after the equipment has been used and field-decontaminated at least once. Prepare equipment blanks by filling or rinsing the pre-cleaned equipment with laboratory-provided analyte-free water, deionized water (DI) and collecting the rinsate in the appropriate sample containers. The samples must be labeled, preserved, and filtered (if required) in the same manner as the environmental samples. Record the type of sampling equipment used to prepare the blank. Have the equipment blanks analyzed for all the analytes for which the environmental samples are being analyzed, unless otherwise specified. Decontamination of the equipment following equipment blank procurement is not required. If laboratory-grade DI water is unavailable, store-grade distilled water can be used to prepare these blanks. If store-grade distilled water is used, be sure to record the source and lot number in the field book. Designate equipment blanks using "EB", followed by the date, and in the order of equipment blanks collected that day. For example, the first equipment blank collected on July 4, 2015, would be designated EB070415-1.

4.6.2 TRIP BLANKS

Trip blanks are used to document VOC contamination attributable to shipping and field handling procedures. Trip blanks are only required when analyzing samples for VOCs. Trip blank(s) are prepared by the laboratory and sent to the facility along with sample containers. Never open trip blank sample bottles; label them in the field and return them to the laboratory in the same shipping container in which the trip blank sample bottles arrived at the site. Keep the trip blank sample bottles in the same shipping container used to ship and store VOC sample bottles during the sampling event. Unless more stringent project requirements are in place, submit one trip blank in each shipping container of VOC samples. To minimize the number of trip blanks needed per shipment, if possible, ship all of the VOC samples in the same shipping container with the trip blank. If laboratory-provided trip blanks are not available, DI water, or store-grade distilled water and clean, empty VOC sample bottles can be used to prepare additional trip blanks. If store-grade distilled water is used, be sure to record the source and lot number in the field book. Identify trip blanks using "TB", followed by the date. For example, the trip blank shipped with a cooler of samples on July 4, 2015, would be designated TB070415-1. If a second trip blank is needed on that same day, the designation would be TB070415-2.

4.6.3 TEMPERATURE BLANK

Temperature blanks are used to determine if proper sample thermal preservation has been maintained by measuring the temperature of the sample container upon arrival at the laboratory. A temperature blank should be included in each sample cooler used to ship and store the sample bottles during the sampling event. If laboratory-provided temperature blanks are not available, fill a clean, unpreserved sample bottle with potable, DI, or store-grade distilled water and identify the bottle as a temperature blank.

4.6.4 DUPLICATES

Duplicates are useful for measuring the variability and documenting the precision of the sampling process. Unless more stringent project requirements are in place, collect duplicate samples at a rate of at least 1 per 20 samples collected. Under no circumstances can equipment or trip blanks be used as duplicates. Sample locations where sufficient sample volume is available and where expected contamination is present should be selected for sample duplication.

Collect each duplicate sample at the same time, from the same sample aliquot and in the same order as the corresponding field environmental sample. When collecting aqueous duplicate samples, alternately fill sample bottle sets (i.e., the actual sample bottle and the bottle to be used for the duplicate) with aqueous samples from the same sampling device. If the sampling device does not hold enough volume to fill the sample containers, fill the first container with equal portions of the sample, and pour the remaining sample into the next sample containers. Obtain additional sample volume and pour the first portion into the last sample container, and pour the remaining portions into the first containers. Continue with these steps until all containers have been filled.

Duplicate samples will be assigned arbitrary sample ID and a false collection time so that they are not identified as duplicates by the laboratory (i.e., submit the samples blind to the lab). The blind duplicate sample "location designation" will be left up to the project manager; however, in no case will "Dup" be allowed to appear in the sample name. Have the duplicate samples analyzed for the same analytes as the original sample. Be sure to record the duplicate sample ID, the false time, and the actual time of collection in the field notebook. The duplicate should also be indicated on our carbon copy of the chain-of-custody.

4.6.5 MATRIX SPIKE AND MATRIX SPIKE DUPLICATES

Matrix spike and matrix spike duplicate samples, known as MS/MSD samples, are used to determine the bias (accuracy) and precision of a method for a specific sample matrix. Many of the company's projects require the collection of MS/MSD samples; however, laboratory generated MS/MSD samples are sufficient for some projects. As required by your QAPP or site-specific work plan, collect MS/MSD samples at the required ratio; if the sampling ratio is not specified by your QAPP or site-specific work plan, collect MS/MSD samples at a rate of 1 for every 20 samples. Clearly convey the MS/MSD identity to the laboratory by adding "MS" or "MSD" after the sample name (e.g., MW 01MS) or in the comments section of the chain-of-custody. Under no circumstances can equipment or trip blanks be used as MS/MSD samples.

4.6.6 SPLIT SAMPLES

Split samples may be collected as a means of determining compliance or as an added measure of quality control. Unlike duplicate samples that measure the variability of both the sample collection and laboratory procedures, split samples measure only the variability between laboratories. Therefore, the laboratory samples must be subsamples of the same parent sample and every attempt must be made to ensure sample homogeneity. Collect aqueous split samples in the same manner as a duplicate sample.

Collecting split samples of soil, sediment, waste, and sludge is not recommended because the homogenization necessary for a true split sample in these matrices is not possible and the resulting laboratory results would not be comparable.

Spilt samples should have the same sample location designation (e.g., MW-01, SB-03 (4-6), but are differentiated from each other by inserting the laboratory analyzing or the agency/consultant collecting the sample after the sample location (e.g., MW-01-WSP and MW-01-EPA).

4.7 CUSTODY DOCUMENTATION

Sample custody protocols are used to demonstrate that the samples and sample containers were handled and transferred in such a manner as to prevent tampering. Legal chain of custody (COC) begins when the pre-cleaned sample containers are dispatched to the field from the laboratory and continues through sample analysis and eventual disposal of the sample and sample containers. Maintaining custody requires that samples must be in the actual possession or view of a person who is authorized to handle the

samples (e.g., sample collector, laboratory technician), secured by the same person to prevent tampering, or stored in a designated secure area.

It is a good idea to limit, to the extent possible, the number of individuals who physically handle the samples. Samples must be placed in locked storage (e.g., locked vehicle, locked storeroom, etc.) at all times when not in the possession or view of authorized personnel. Do not leave samples in unoccupied motel or hotel rooms or other areas where access cannot be controlled by the person(s) responsible for custody without first securing samples and shipping or storage containers with tamper-indicating evidence tape or custody seals

The COC form is used to trace sample possession from the time of collection to receipt at the laboratory. Although laboratories commonly supply their own COC form, it is recommended that the company's COC be used to ensure that all necessary data are recorded. Unless more stringent project requirements are in place, submit one COC form per sample shipment. At a minimum, the COC needs to have a unique COC number, accompany all the samples, and include the following information:

- Project number, name, and location
- Sampler's printed name(s) and signature(s)
- Sample identification number
- Date and time (military time) of collection
- Sample matrix
- Total number of containers per sample
- Parameters requested for analysis including number of containers per analyte
- Remarks (e.g., irreducible headspace, field filtered sample, expected concentration range, specific turn-around time requested, etc.)
- Signatures of all persons involved in the chain of possession in chronological order
- Requested turn-around-time
- Name and location of analytical laboratory
- Custody seal numbers
- Shipping courier name and tracking information
- Internal temperature of shipping container upon shipment to laboratory, as needed
- Internal temperature of shipping container upon delivery to laboratory
- Employee contact information

Affix tamper-indicating evidence tape or seals to all storage and shipping container closures when transferring or shipping sample container kits or samples to an off-property party. Place the seal so that the closure cannot be opened without breaking the seal. Record the time, calendar date and signatures of responsible personnel affixing and breaking all seals for each sample container and shipping container. Affix new seals every time a seal is broken until continuation of evidentiary custody is no longer required.

FIELD STANDARD OPERATING PROCEDURE #6

DECONTAMINATION PROCEDURE

The decontamination procedures outlined in this standard operating procedure (SOP) are designed to ensure that all sampling equipment is free from the analytes that could potentially interfere with the sample results. The user is advised to read the entire SOP and review the site health and safety plan (HASP) before beginning any onsite activities. In accordance with the HASP, proper personal protective equipment (PPE) must be selected and used appropriately.

6.1 ACRONYMS AND ABBREVIATIONS

DI	Deionized water
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
HASP	Health and safety plan
PPE	Personal protective equipment
QAPP	Quality assurance project plan
SOP	Standard operating procedure

6.2 MATERIALS

- Field book
- PPE
- Polyethylene sheeting and/or garbage bags
- Laboratory-grade non-phosphate detergent[1] (e.g., Luminox® or Liquinox®)
- Cleaning reagents, as needed (e.g., isopropyl alcohol, methanol, hexane, etc.)
- Potable water
- Deionized (DI) water
- Containers (e.g., plastic buckets)
- Nylon brushes
- Aluminum foil
- Spray bottles
- Paper towels
- Pressurized steam cleaner (e.g., steam jenny), as needed
- Decontamination pad, as needed

6.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

[1] Not all laboratory-grade detergents are phosphate free. Be sure to verify the detergent's phosphate content before use.

This SOP is written for the sole use of company employees and will be revised periodically to reflect updates to company policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company's SOPs. Employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

This SOP is designed to provide the user with a general outline for decontamination and assumes the user is familiar with basic field procedures, such as recording field notes (SOP 1), sample shipment procedures (SOP 3), sample collection and quality assurance procedures (SOP 4), and investigation-derived waste management procedures (SOP 5). All decontamination references must be available for consultation in the field, including:

- Company's SOPs
- Applicable state and federal guidelines or procedures
- Manufacturer's manuals
- Project-specific work plan and HASP
- QAPP

6.4 GENERAL PROCEDURES

The cleaning and decontamination procedures described below are designed to ensure that the equipment used for sample collection is free of analytes that could potentially alter the analytical results. These procedures are primarily targeted at reducing the incidence of cross-contamination (i.e., compounds of interest being transferred on the sampling equipment from one sample location or depth to another) and, when properly implemented, provide a methodology for obtaining high quality, representative results. As with all analytical sampling, the effectiveness of the cleaning procedures must be demonstrated with the collection of equipment blanks. The sampling procedures and equipment blank collection frequency are discussed in SOP 4.

6.4.1 EQUIPMENT AND REAGENT SELECTION

It is important for employees to evaluate the expected types of contamination before mobilization to a site. State programs (or the U.S. Environmental Protection Agency [EPA], depending on the site) may require more stringent decontamination procedures than those listed in this SOP, specify the types and grades of various cleaning detergents and reagents (e.g., acids and solvents), or allow the use of phosphate-containing detergents, such as Alconox®. Many of these reagents, such as nitric acid or pesticide-grade hexane, are U.S. Department of Transportation (DOT) hazardous materials and must be shipped using a ground delivery service. These compounds may also require specialized PPE (e.g., eye protection for concentrated acids) or have other special handling or disposal procedures that must be considered before arriving onsite. Decontamination equipment (e.g., spray bottles, brushes, etc.) should be constructed of non-reactive, non-leachable materials (e.g., metal, glass, Teflon®-coated, polyethylene, etc.) which are compatible with the reagents and solvents being used for decontamination.

In specific cases, it may be necessary to steam clean the field equipment before proceeding with the decontamination steps presented in Section 6.5 (e.g., hollow stem augers). Generally, the company's subcontractors are responsible for bringing or building a decontamination pad, if necessary, to contain the spray from a steam jenny. Decontamination pads should be constructed on a level, paved surface (if possible) in an area known or believed to be free of surface contamination, and should be of sufficient size to contain the decontamination water. Equipment that is steam cleaned should be placed on racks or saw horses and not on the floor of the decontamination pad. Decontamination water should be removed from the decontamination pad frequently to minimize the potential for leaks or overflow.

Consult and involve the company's compliance professionals for storage procedures and disposal requirements of solvent rinsate, detergent wastes, and other decontamination materials.

6.4.2 OTHER CONSIDERATIONS

In preparing for decontamination, you should perform the following activities (with all observations and measurements noted in the field book):

- Perform a quick reconnaissance of the site to identify a decontamination (pad) area and evaluate the accessibility to and safety of the location.
- Record a description of the decontamination (pad) area.

Survey the breathing zone around the decontamination area with the appropriate air quality meter(s), as necessary (see HASP), to ensure that the level of PPE is appropriate. When decontaminating equipment, it is important to find a suitable location away from any sources of cross-contamination that could compromise the integrity of the decontamination. As possible, position the decontamination area away from fuel-powered equipment, such as drill rigs or excavators, and upwind of other site activities (e.g., purging, sampling).

6.5 DECONTAMINATION PROCEDURES

The decontamination procedures are based on a nine-step process, which is tailored in the field depending on the samples to be collected. Decontaminate all non-dedicated equipment that contacts the sample directly, including spoons, trowels, pumps, etc., before and between each sample location and sampling interval. Record decontamination procedures in the field book. Disposable, single use items, such as bailers or tubing, do not require decontamination.

The decontamination process includes the following four basic steps:

1. Physical removal of debris
2. Wash with non-phosphate detergent, such as Liquinox®, and nylon brush
3. Potable water rinse
4. Deionized (DI), analyte-free water rinse (distilled water can be used as a substitute)

The first step is to remove as much soil or other debris from the sampling device as possible near the sampling area to limit the spread of potentially-contaminated materials into clean areas of the site.

Cleaning and decontamination should occur at a designated area(s) (decontamination pad) on the site. If gross contamination or an oily film or residue is observed on the equipment, use steam jenny or wash by hand using a brush to remove the particulate matter or surface film. Heavy oils or grease may be removed with paper towels soaked with isopropyl alcohol.

The physical removal is followed by a hand wash using non-phosphate detergent (mixed to the appropriate dilution in potable water) followed by a potable water rinse. If not using a decontamination pad, the most common set-up uses 5-gallon plastic buckets for washing and rinsing, although plastic garbage pails or plastic tubs can also be used. Place containers on polyethylene sheeting to limit spillage of the decontamination fluids.

Be sure to scrub the equipment thoroughly with a nylon bristle brush (or similar) and allow enough submersion time for the non-phosphate detergent to effectively clean the surfaces (a simple dunk of the equipment in the detergent solution is insufficient). If decontaminating submersible pumps, flush both the non-phosphate detergent wash fluid and the potable water rinse through the pump body itself (usually done in separate buckets) to ensure that the internal components are thoroughly cleaned. The internal decontamination of motorized pumps can be accomplished by pumping the non-phosphate detergent wash fluid and the potable water rinse through the pump. Replace the detergent solution and rinse water when it becomes oily or silty.

Place the DI water for the rinse in a small spray bottle or pour over the equipment after the potable water rinse. **Typically, this level of decontamination (i.e., steps 1 through 4) is sufficient.**

Following Steps 1 through 4, additional decontamination (steps 5 through 9) may be required by the applicable federal or state guidelines, the project-specific work plan or the QAPP. Typically, these decontamination steps are performed when sampling for inorganics using non-motorized equipment. These steps include:

5 10% nitric acid rinse
6 DI water rinse
7 Pesticide-grade solvent rinse (e.g., hexane or isopropyl alcohol)
8 Air dry (solvent must evaporate)
9 DI water rinse

Isopropyl alcohol is the recommended solvent for organic contaminants because it is readily available (at most drug and department stores) and is not a DOT hazardous material. However, other solvents (e.g., hexane and methanol) may be more effective in removing certain contaminants, such as oils or polychlorinated biphenyls, but any waste generated using these solvents must be managed accordingly.

Handle the solvents and acid with care and store unused chemicals in their original, labeled, protective containers when not in use. It is a good idea to transfer small quantities of each solution into labeled, laboratory-grade spray bottles, which offer a convenient and controllable way to rinse the equipment. The equipment can then be rinsed over a 5-gallon plastic bucket or other suitable container placed on plastic sheeting as with the first part of the cleaning process. Nitric acid rinses must be used only on non-carbon steel sampling devices. Do not spray acid into pumps.

6.6 HANDLING DECONTAMINATED EQUIPMENT

Handle any decontaminated equipment using clean gloves to prevent re-contamination. Place the equipment away (preferably upwind) from the decontamination area once the process has been completed on clean plastic sheeting to allow it to air-dry. Once the equipment is dry, protect it from re-contamination by securely wrapping and sealing with aluminum foil (shiny side out) or clean, disposable plastic bags. Plastic bags may be wrapped directly around wet or dry equipment except when the expected contaminants include volatile and extractable organics; under those circumstances, allow the equipment to completely dry or wrap it in aluminum foil.

All sampling equipment must be decontaminated at the end of the investigation (i.e., prior to departure from the site). Label each piece of equipment with the date of decontamination, the initials of personnel performing the decontamination, and the type of decontamination solution(s) used. Containerize all solvent rinsate, detergent wastes, and other disposable decontamination materials in DOT-compliant containers in accordance with SOP 5 or the project-specific work plan. Dispose of all wastes in conformance with the project-specific work plan and applicable regulations.

FIELD STANDARD OPERATING PROCEDURE #9

SOIL SAMPLING PROCEDURE

The soil sampling procedures outlined in this standard operating procedure (SOP) are designed to ensure that collected soil samples are representative of current site conditions. Soil samples can be collected for onsite screening or for laboratory analysis. The user is advised to read the entire SOP and review the site health and safety plan (HASP) before beginning any onsite activities. In accordance with the HASP, proper personal protective equipment (PPE) must be selected and used appropriately.

9.1 ACRONYMS AND ABBREVIATIONS

ºF	Degrees Fahrenheit
HASP	Health and Safety Plan
IDW	Investigation derived waste
PID	Photoionization detector
PPE	Personal protective equipment
QAPP	Quality Assurance Project Plan
QA/QC	Quality assurance/quality control
SOP	Standard operating procedure
USCS	Unified Soil Classification System

9.2 MATERIALS

- Field book
- PPE
- Air quality monitoring equipment, (e.g., photoionization detector [PID]), as needed
- Field test kits, as needed
- Sampling containers and labeling/shipping supplies
- Knife or scissors
- Ruler or tape measure
- Soil sampling method specific materials, as needed:
  - Stainless steel trowels, probes, or shovels
  - Stainless steel spatulas or spoons
  - Bucket augers, auger extension rods, auger handle, pipe wrenches
  - Split-spoon samplers, pipe wrenches
  - Direct-push acetate liners
  - Shelby tube samplers, plastic or wax caps
  - Mixing tray or bowl
- Munsell color chart
- Decontamination supplies

9.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field

personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

This SOP is written for the sole use of company employees and will be revised periodically to reflect updates to company policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company SOPs. Employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

This SOP is designed to provide the user with a general outline for conducting soil sampling and assumes the user is familiar with basic field procedures, such as recording field notes (SOP 1), utility location (SOP 2), sample shipment procedures (SOP 3), sample collection and quality assurance procedures (SOP 4), investigation-derived waste (IDW) management procedures (SOP 5), equipment decontamination (SOP 6), and use and calibration of sampling and monitoring equipment (SOPs 7 and 8). This SOP does not cover investigation planning, nor does it cover the evaluation of the analytical results. These topics are more appropriately addressed in a project-specific work plan. Before soil sampling, be sure to review the project-specific work plan or Quality Assurance Project Plan (QAPP) and any applicable state and federal guidelines or sampling procedures. All sampling and monitoring references must be available for consultation in the field, including:

— Company's SOPs
— Applicable state and federal guidelines or sampling procedures
— Manufacturer's manuals
— Project-specific work plan and HASP
— QAPP

9.4 GENERAL PROCEDURES

Soil samples are collected using a variety of techniques and equipment, depending on the type (e.g., surface, subsurface) and purpose (e.g., lithological logging, headspace evaluation, laboratory analysis) of the sampling, and most sampling events employ more than one equipment type or methodology. Subsurface soil sampling, for example, often includes sample collection from split-spoon, macro-core, or other dedicated sampling devices advanced into the subsurface. Recovered cores are often logged (using a Munsell color chart and other logging aids), screened for volatile organic compounds (VOCs) using a PID, and sampled for laboratory analysis using disposable stainless steel spoons or other discrete sampling devices.

Each sampling configuration is associated with a unique set of sampling equipment requirements and techniques. The selected procedures and equipment are project-specific and should be discussed by the project team before arriving onsite. All types of soil sampling, regardless of the equipment used, share common handling and management procedures that are designed to ensure the integrity of the samples collected. These procedures include:

— The use of new, disposable or decontaminated sampling equipment
— The use and rotation of the appropriate PPE
— Selection of a suitable sampling location and staging area

Wear a clean pair of new, disposable gloves each time a different sample is collected and don the gloves immediately prior to collection. This limits the possibility of cross-contamination from accidental contact with gloves soiled during collection of the previous sample. The gloves must not come in contact with the medium being sampled and must be changed any time during sample collection when their cleanliness is compromised. In no case should gloved hands be used as a soil sampling device; if the soil cannot be transferred directly from the sampling device to the laboratory-supplied containers use a stainless steel spoon or spatula to transfer the soil from the sampling device to the laboratory-supplied containers.

9.4.1 EQUIPMENT SELECTION

Collect all samples using either new, disposable equipment, such as polyethylene liners or single-use stainless steel spoons; or properly decontaminated sampling equipment, such as hand augers, split-spoon samplers, or trowels. Soil sampling equipment

should be selected based on the analytical requirements of the project and the project-specific conditions likely to be encountered. The equipment should be constructed of non-reactive, non-leachable materials (e.g., stainless steel, Teflon®, Teflon®-coated steel, polyethylene, polypropylene) which are compatible with the chemical constituents at the site. When choosing sampling equipment, give consideration to:

- the types of soil or fill present
- the required depth of the sample
- the volume of sample required
- the analytes of interest

Select the types of equipment and decontamination procedures based on the types of sampling to be performed. Decontamination may require multiple steps or differing cleaning methods, depending on the sampling goals (see SOP 6 for decontamination procedures). In no case should disposable, single use materials (e.g., acetate liners, soil baskets) be used to collect more than one sample.

9.4.2 SAMPLING CONSIDERATIONS

In preparing for sampling, you should perform the following activities (with all observations and measurements noted in the field book):

- Perform a quick reconnaissance of the site to identify sampling locations and evaluate the accessibility (physical obstructions, slope, overhead and underground utilities) to the sampling location.
- Record the approximate ambient air temperature, precipitation, wind (direction and speed), tide, and other field conditions in the field book. In addition, any site-specific conditions or situations that could potentially affect the samples at the sample locations should be recorded.
- Record a description of the sampling location and the approximate distance to and direction from at least one permanent feature.
- Should any sample location require a vertical or horizontal offset from the proposed location, indicate the reason and record the actual sample location in the field book.

Survey the breathing zone around the sampling location with the appropriate air quality meter(s), as necessary (see HASP), to ensure that the level of PPE is appropriate. When sampling soil, it is important to find a suitable sampling location away from any sources of cross-contamination that could compromise the integrity of the samples. Consider the following:

- Position the sample collection area away from fuel-powered equipment, such as drill rigs or excavators, and upwind of other site activities (e.g., purging, sampling, decontamination) that could influence the sample. This is particularly important when screening samples in the field for VOCs with a PID, but should not be limited to the active sample collection.
- Store samples already collected from the field for laboratory analysis in clean containers in an ice-filled cooler (as required) and securely stage, if possible, in an uncontaminated area of the site.

9.5 SOIL COLLECTION

Soil samples can be collected from surface or subsurface depths, depending on the project requirements. Surface soils are generally those collected at depths less than 2 feet below ground surface (bgs) and can be collected using trowels, soil probes, shovels, or hand augers. Be aware that some states have specific definitions of what constitutes a surface soil sample. Subsurface soils are generally deeper and require specialized equipment to recover the samples. In most cases, subsurface soils will be collected using a drill rig or excavator to prevent the soil from being mixed with soils from a shallower interval.

Push or drive the method-specific sampling equipment (e.g., trowel, hand auger, hollow corers, split-spoon, direct push sampler, rotosonic core barrel sampler, excavator bucket) into the soil to the desired sampling depth using cleaned equipment. Record in the field book the depth interval through which the sampler was advanced and, when using a split-spoon sampler, the number of blows needed to drive the sampler 6 inches. If additional soil is needed to provide sufficient sample volume, repeat this step taking

care to ensure that the same depth interval is collected during the resample. Use core catchers on the leading end of the sampler (if available) for soils that lack cohesiveness and are subject to falling out of the sampler (i.e., poor recovery).

Withdraw the sampling equipment from the interval, open the sampler (as appropriate), and collect the sample safely (e.g., avoid entering an excavation by collecting the sample from an excavator bucket at ground surface). Samples collected from an excavator bucket should be taken from the center of the material to ensure material is representative of the desired sampling interval.

Recovered soils should be placed on plastic sheeting in a consistent manner such that the orientation of the sample (i.e., which end is "up") and the depth interval is readily apparent to the sampling personnel. Measure the length of the material recovered relative to the interval the sampler was advanced in percent notation (e.g., 75%) or as a fraction of the total length of the sample interval (e.g., [3/4] indicating 3 out of 4 feet) and record this information in the field book. If field screening for organic vapors is required, break or cut the soil core every 3 to 4 inches and quickly scan the breaks in the core material with the appropriate air quality monitoring equipment (e.g., PID) and record the readings and approximate depth in the field book. These measurements can be used to select appropriate soil samples for VOC or headspace analysis, if required (see procedures below).

9.5.1 UNDISTURBED SOIL SAMPLES

Undisturbed soil samples collected for geotechnical parameters (e.g., porosity, permeability) generally require the use of specialized undisturbed sampling equipment (e.g., Shelby tube or sealed Geoprobe® liner) and collection procedures. The sampling device, once retrieved, is typically capped or sealed (to maintain the sample in its relatively undisturbed state), labeled with the sample name, orientation of the sample (i.e., top and bottom), depth interval, and shipped to the appropriate geotechnical laboratory. Follow sample labeling, preparation, and shipping procedures in SOPs 3 and 4.

9.5.2 VOLATILE ORGANIC COMPOUND SAMPLING

Analytical soil samples for VOC analysis should be collected immediately after screening with the PID to avoid loss of constituents to the atmosphere. Transfer the soil from the portion of the soil core to be sampled (usually the area where the highest PID readings were observed) directly into the sample containers; do not homogenize soils for VOC analysis. Place the soil in the sampling container such that no headspace is present above the soil when the cover is placed on the jar. If U.S. Environmental Protection Agency Method 5035 (e.g., Encore® samplers) is required, follow manufacturer's specifications and company recommended shipping procedures. Collect quality assurance/quality control (QA/QC) samples, if appropriate, in accordance with SOP 4, the project-specific work plan, and the QAPP.

9.5.3 SOIL HEADSPACE ANALYSIS

Collect soil samples for field-based headspace analysis, if required as part of the project-specific work plan, after collecting the VOC sample. First, examine the soil and remove coarse gravel, organic material (e.g., roots, grass, and woody material) and any other debris. Transfer the soil from the portion of the soil core to be sampled and place in a heavy-duty zipper-style plastic bag and seal the bag. Label the sample indicating the sampling location, depth, and date. Shake the sample vigorously for approximately 15 seconds to disaggregate the sample and expose as much surface area of the soil as possible (to release the VOCs to the atmosphere within the bag). If necessary, warm the sample to room temperature (70º Fahrenheit, [ºF]) by placing the bag in a heated room or vehicle. This step is critical when the ambient temperature is below 32ºF.

The VOCs, if present, will volatilize into the sealed bag. Allow the bag to stand (to achieve equilibrium) for approximately 15 minutes. Carefully open the bag slightly and place the tip of the PID into the opening. Do not insert the tip of the probe into the soil material and avoid the uptake of water droplets. Allow the PID to equilibrate and record the highest PID measurement noted. Erratic PID responses may result from high organic vapor concentrations or elevated headspace moisture. If these conditions exist, qualify the headspace data in the field book. It is also important to record the ambient temperature, humidity, and whether moisture was present in plastic bag. Duplicate 10% of the headspace samples by collecting two samples from the same location.

Generally, duplicate sample values should be consistent to ±20%. Samples collected for headspace screening cannot be retained for laboratory analysis.

9.5.4 SEMI- AND NON-VOLATILE ANALYTICAL SAMPLE COLLECTION

Collect remaining organic samples then inorganic samples in the following order of volatilization sensitivity:

- Extractable organics, petroleum hydrocarbons, aggregate organics, and oil and grease
- Metals
- Inorganic non-metallic and physical and aggregate properties
- Microbiological samples
- Radionuclides

If homogenization is required, mix the soils (using stainless steel bowls and spoons, or other appropriate equipment) to a homogeneous particle size and texture. Transfer the soils from the sampler or mixing bowl to the sample container using a decontaminated or dedicated stainless steel spoon or spatula. Collect QA/QC samples in accordance with SOP 4, the project-specific work plan, and the QAPP.

If approved by the appropriate regulatory agency and specified in the project-specific work plan, composite soil samples can be collected to minimize the total number of analytical samples. Composite samples consist of equal aliquots (same sample size) of soil from each location being sampled (e.g., from each borehole or from multiple areas of a soil pile), by mixing the waste to a homogeneous particle size and texture using new or decontaminated stainless steel bowls and a stainless steel spoon or trowel. Transfer the contents to the appropriate laboratory supplied sample container using a stainless steel spoon. Collect QA/QC samples in accordance with SOP 4, the project-specific work plan, and the QAPP, if required.

If necessary, conduct field tests or screening on soils in accordance with the project-specific work plan and manufacturer's specifications for field testing equipment.

9.5.5 SAMPLE LABELING AND PREPARATION FOR SHIPMENT

Once collected, prepare the soil samples for offsite laboratory analysis:

1. Clean the outside of the sample container with paper towels or appropriate materials, if necessary
2. Affix a sample tag or label to each sample container and complete all required information (sample number, date, time, depth interval, sampler's initials, analysis, preservatives, place of collection)
3. Place clear tape over the tag or label (if non-waterproof labels are used)
4. Preserve samples immediately after collection by placing them into an insulated cooler filled with bagged wet ice to maintain a temperature of approximately 4°Celcius (if required by analytical method)
5. Record the sample designation, date, time, depth interval, and the sampler's initials in the field book and on a sample tracking form, if appropriate
6. Complete the chain-of-custody forms with appropriate sampling information, including:
   - Location
   - Sample name
   - Sample collection date and time
   - Number of sample containers
   - Analytical method
7. Complete sample packing and ship in accordance with proper procedures

Do not ship hazardous waste samples without first consulting a company compliance professional.

9.5.6 SOIL CLASSIFICATION

Soil classification should be performed whenever soil samples are being collected to provide context for the analysis. Follow the Unified Soil Classification System (USCS) logging procedures as described in ATSM D2488[1] . The emphasis of soil classification in the field must be on describing the soils using ALL of the required descriptors; categorization of the USCS group name or symbol alone may not provide details about the soils that could later prove useful. Avoid geologic interpretation or the use of local formation names, which are often difficult to determine in the field without the regional framework. Record ALL of the following information for each sample interval/soil type:

- Depth interval
- USCS group name
- USCS group symbol
- Color, using Munsell chart (in moist condition)
- Percent of cobbles or boulders, or both (approximate; by volume)
- Percent of gravel, sand, or fines, or all three (approximate; by dry weight)
- Particle-size range:
  - Gravel—fine, coarse
  - Sand—fine, medium, coarse
  - Fines – clay or silt
- For gravel and sand:
  - Particle angularity: angular, subangular, subrounded, rounded
  - Particle shape: (if appropriate) flat, elongated, flat and elongated
  - Maximum particle size or dimension
  - Hardness of coarse sand and larger particles
- For clay and silt:
  - Plasticity: non-plastic, low, medium, high
  - Dry strength: none, low, medium, high, very high
  - Dilatancy: none, slow, rapid
  - Toughness: low, medium, high
- Odor (mention only if organic or unusual; factual descriptions only, no interpretations)
- Moisture: dry, moist, wet
- Additional comments: presence of roots or root holes, presence of mica, gypsum, etc., surface coatings on coarse-grained particles, caving or sloughing of auger hole or trench sides, difficulty in augering or excavating, etc.

For intact samples also include:

- Consistency (fine-grained [clay] soils only): very soft, soft, firm, hard, very hard
- Structure: stratified, laminated, fissured, lensed, homogeneous
- Cementation: weak, moderate, strong

Use the following standard descriptors for the textural percentages:

- Trace: <5%[2]
- Few: 5-10%
- Little: 15-25%
- Some: 30-45%
- Mostly: 50-100%

Example descriptions, using the information listed above, would read as follows:

[1] Note that certain states/regulatory programs may require soil classification under a secondary system (e.g., US Department of Agriculture) or the use of hydrochloric acid to test the reaction with soil (none, weak, strong).

[2] The use of "Trace" for describing the fraction of clay soils is inappropriate for field-based logs as clay contents of less than 20% in fine-grained soils cannot be reliably determined in the field.

- 8-10' – Well Graded Sand, SW (5YR 2/6) fine- to medium-grained sand, trace medium sub-angular rounded gravel (less than 0.5-inch diameter); medium dense to dense; wet; moderate petroleum-like odor between 9 feet bgs and 10 feet bgs.
- 10-12' – Lean Clay with Gravel, CL (5YR 2/6) some fine- to coarse-grained angular to subangular gravels (less than 0.25-inch diameter), trace fine- to medium-grained rounded sands; very stiff; low plasticity; low dry strength; no dilatancy; moist; no odors.

9.6 CLOSING NOTES

Once sampling is completed, restore and mark all sample locations with spray paint, stakes, or other appropriate marker for future reference or survey in accordance with the project-specific work plan. Decontaminate all equipment prior to departure and properly manage all PPE and IDW in conformance with applicable regulations.

FIELD STANDARD OPERATING PROCEDURE #1

NOTE TAKING AND FIELD BOOK ENTRIES PROCEDURE

The field book is a record of the day's activities that serves as a reference for future reporting and analyses. The field book is also a legal record for projects that may be used during legal proceedings. It is of the utmost importance that all notes are complete and comprehensive. The user is advised to read the entire standard operating procedure (SOP) and review the site health and safety plan (HASP) before beginning any onsite activities.

1.1 ACRONYMS AND ABBREVIATIONS

HASP	Health and safety plan
IDW	Investigation-derived waste
SOP	Standard operating procedure

1.2 MATERIALS

— Permanently-bound waterproof field book (e.g., Rite-in-the-Rain® #550, or equivalent)
— Black or blue ballpoint pen (waterproof ink recommended; do not use felt-tip pens)

1.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

This SOP is written for the sole use of company employees and will be revised periodically to reflect updates to company policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company's SOPs. Employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

The purpose of the field book is to provide a written log of all of field events and conditions. The notes must include sufficient detail (i.e., who, what, when, where, why, and how) to enable others to reconstruct the day's activities for analysis, reporting, or litigation. It is important to be objective, factual, and thorough. Language must be free of personal comments or terminology that might prove inappropriate. Additional data logs or worksheets, such as low flow groundwater sampling sheets, may be used as a supplement; however, under no circumstances should the data sheets be used as a substitute for the daily record of events to be recorded in the field book.

The field book forms the foundation upon which most of the project work (reports, subsequent work plans, etc.) is based. It is critical that the field book's chain of custody be maintained at all times.

1.4 SET-UP PROCEDURES

The first step in setting up a new field book is to add the information necessary for you to identify the field book in the future and for others to return the book to the company, should it be lost. On the first page of the field book (or, for some field books, the inside cover), place a "Return for Reward" notice. Include the following information:

- An "If Found – Return for Reward" notice in bold letters
- Our company name
- Our company address (usually the office where the project is being managed)
- Our company phone number

Reserve the second page of the field book for project-specific information, such as:

- The project name and number
- The project manager's name
- The site telephone number, address, and onsite contact (if appropriate)
- The names and telephone numbers for all key (onsite) personnel
- The emergency telephone numbers including the police, fire, and ambulance (found in the HASP)

Business cards from individuals who visit the site, (including the person in charge of the field book) can be affixed to the inside back cover.

1.5 FIELD BOOK ENTRIES

Start each day on a new page. Include the following information in the header of the first page (and all subsequent pages):

- The date
- The project name
- The page number (if not pre-printed in the field book)

Precede field book entries by the time entered along the left margin of the page using a 24-hour or military clock (e.g., 1330 for 1:30 PM). The first entry of the day must include your and your subcontractor's arrival time at the site, a description of the planned activities, key onsite personnel (including subcontractors), and the weather forecast. The first entry must also detail the tailgate review of the site-specific HASP with the onsite personnel. Be sure that field book entries are LEGIBLE and contain factual, accurate, and inclusive documentation of project field activities. Do not leave blank lines between field book entries. If a mistake is made in an entry, cross out the mistake with a single line and place your initials at the end of the line. Any acronyms written in the field book (including your initials) must be spelled out prior to the first use.

Subsequent log entries must document the day's activities in sequence and must be completed throughout the day as events occur (i.e., do not wait until the end of the work day to complete the notes); should notes need to be entered out of sequence, please identify the non-sequential entries using a footnote or by clearly indicating "Late Entry." Notes must be descriptive and provide location information or diagrams (if appropriate) of the work area or sample locations. Note any changes in the weather and document all deviations from the work plan. Arrival and departure times of all personnel, operational periods of standby, decontamination, and specific activities must be recorded.

Include the following information in entries describing field activities:

- The equipment, materials and methods used by subcontractors, if appropriate (e.g., drill rig type, boring diameters, well casing materials, etc.)
- The equipment, materials and methods used to obtain samples (e.g., split-spoon sampler, polyethylene bailer, pump types, geochemical, water or air monitoring equipment, low-flow purging procedures, etc.)
- The sample identification, which should include the location and depth, as appropriate
- The sample location, including a description of the approximate location as measured from a known point (e.g., 50 feet north of the building entrance; for points not yet surveyed)
- Any air or water monitoring equipment used, associated calibration activities, and measurements

- The sample collection time
- The sample identification of associated quality assurance/quality control samples (e.g., blind duplicate)
- The sample media and analyses to be performed; sizes, numbers, and types of containers; preservation (if any), and any resulting reactions (e.g., effervescence)
- If supplemental data recording logs (digital or hard copy) are used, such as groundwater sampling logs, chains-of-custody, and shipping records, the above information must be entered in the field book and the supplemental records cross-referenced
- The decontamination and disposal procedures for all equipment, samples, and personal protective equipment
- An inventory of the investigation-derived waste (IDW) materials generated during the site activities
- A description of the IDW labeling procedures and the onsite staging information; other sampling-specific information to be included in the IDW log is provided in SOP 5

Maintain a sequential log if the sample locations and areas of interest are photographed (strongly recommended). The photographic log must include:

- The date and time of the photograph
- The sequential number of the photograph (e.g., photograph-1, photograph-2, etc.)
- The general direction faced when the photograph was made
- A description of the subject in the image

1.6 CLOSING NOTES

The last entry of the day must include a brief wrap up of the work accomplished, a description of how the site is being secured, and a description of any near hits, accidents, and incidents that occurred during the day's work. Draw a line through the remainder of the page from the row of text diagonally through any blank lines and initial at the end of the diagonal line.

FIELD STANDARD OPERATING PROCEDURE #2

UTILITY LOCATING PROCEDURE

The purpose of this procedure is to ensure that all required and appropriate procedures are followed to locate and mark subsurface utilities (e.g., electrical lines, natural gas lines, communication lines) before initiating any intrusive field activities (e.g., drilling, test pits, trenching, excavation). The company's preference, as indicated in our subcontractor agreement templates, is for our contractors to be responsible for both public and private utility mark-outs; this includes contacting the public authority and obtaining a subcontractor for private utility locating services, if needed. Guidance for contractors to follow to conduct a utility clearance is provided in our request for proposal (RFP) template and must be included in all RFP's for intrusive field activities. **In certain extraordinary circumstances, the company may choose to be responsible for clearing utilities, which will require a change in the template language of our subcontractor agreement. The revised agreement requires the approval and signature of a member of the Environmental Leadership Team (ELT).**

For projects where the company will be responsible for clearing utilities, compliance with this procedure is mandatory. **ALL** deviations from this standard operating procedure (SOP) **MUST** be approved by the project manager and a member of the ELT **BEFORE** beginning intrusive work.

Field personnel have the authority and responsibility to postpone intrusive activities if a contractor has not completed utility clearances to the company's satisfaction; if sufficient information, as stipulated in this SOP, is not available; or if onsite reconnaissance identifies inconsistencies in the findings of utility locators. In these instances, field personnel must notify the project manager or the health and safety officer, or their designee, before proceeding with the proposed work; approval from a member of the ELT is required before the work commences.

The user is advised to read the entire SOP and review the site health and safety plan (HASP) before beginning any onsite activities.

2.1 ACRONYMS AND ABBREVIATIONS

HASP	Health and safety plan
ELT	Environmental Leadership Team
RFP	Request for proposal
SOP	Standard operating procedure

2.2 MATERIALS

- Utility Locating Form (Attachment 1)
- Field book
- Wood stakes
- Spray paint
- Flagging tape
- As-built drawings for sub-grade utilities (if available)
- Hand auger or post-hole digger

2.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field

personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

This SOP is written for the sole use of company employees and will be revised periodically to reflect updates to company policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company SOPs. Employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

This procedure is intended to allow the work to proceed safely and minimize the potential for damaging underground and aboveground utilities. Intrusive work includes all activities that require the company's employees or its subcontractors to penetrate the ground surface. Examples of intrusive work include, but are not limited to, hand augering, probing, drilling, injections, test pit excavations, trenching, and remedial excavations.

This SOP assumes the user is familiar with basic field procedures, such as recording field notes (SOP 1).

2.4 PRE-FIELD MOBILIZATION PROCEDURES

Regardless of who is responsible for completing these activities (company or a contractor), public rights-of-way and private property must be cleared of buried utilities and overhead utilities must be identified before any intrusive work can begin. The first step in this process is notifying the state public utility locating service of the planned work. These services provide a link between the entities performing the work and the various utility operators (e.g., the water company, the electric company, etc.). All of the public utility locating service call centers in the United States have been streamlined under a single "Call Before You Dig" phone number: 811.

Please note, some state laws require that the person who will actually be conducting the intrusive work must be the person who places the call to the public utility locating service. This means that the company cannot make this call on the contractor's behalf; the contractor must place the call in those states where required. The Common Ground Alliance has established a web site that includes state-specific information to assist in making this determination (http://www.call811.com/state-specific.aspx) for sites in the US and some parts of Canada. If there is any doubt about the requirements for the state where a project is located, the relevant state authority must be contacted.

When the call center is contacted, information regarding the site (e.g., location, nearest cross street, township, etc.) and work activity (e.g., drilling, excavation) will need to be provided to the operator to aid in locating the likely utilities at the work site. The information provided on the Utility Locating Form (Attachment 1) must be recorded (by the contractor or the company) and a completed copy of this form must be maintained as part of the project file. Be aware that several states, including California, require that the proposed drilling locations be marked with white spray paint before contacting the locating services.

The following information must accompany the field team at all times during the field project:

- The utility clearance ticket number
- The ticket's legal dig date
- The ticket's expiration date
- Utility providers that were contacted

The ticket number serves as a point of reference for both the utility service providers and for the company or contractor should follow up (e.g., renewing the ticket) with the locating service be required. The legal dig and expiration dates reflect the times when it will be legal to perform the proposed work. The legal dig date reflects the lead time necessary, typically between 48 and 72 hours after you call, for the utility service providers to mark the utilities in you work area. Be sure to include this delay when scheduling your work. Most utility clearance tickets expire about 2 weeks after the legal dig date. If your work is delayed beyond the expiration date, the 811 utility locating service will need to be called again and the ticket renewed. The renewed ticket will have a new legal dig date that incorporates the same lead-time (48 to 72 hours) as the original ticket.

The locating service will also provide the caller with a list of utility companies that will be notified. Compare this list with utilities generally expected at all sites (e.g., sewer, water, gas, communication, and electric). Some utilities (e.g., sewer, water, cable TV) may not be included. If any expected utilities are absent from the contact list, the utilities **MUST** be contacted directly for clearance before the start of intrusive activities. All contacts should be recorded on the Utility Locating Form.

2.4.1 PRIVATE UTILITY LOCATORS AND OTHER SOURCES

Public utility service providers will generally mark their underground lines within the public right-of-way up to the private property boundary. A public utility locating service must be contacted prior to any intrusive work, regardless of whether the intrusive work is located on public or private property. However, be aware that most service providers will not locate utilities on private property. If your work is to be conducted on private property, a private utility locating service **MUST** be used to clear the work area. These companies typically use a variety of methods (e.g., electromagnetic detectors, ground-penetrating radar, acoustic plastic pipe locator, trace wire) to locate utilities in the work area, including those that may be buried beneath onsite buildings. Be aware that witching is not an acceptable utility location method.

For all operating facilities and to the extent possible for closed facilities, identify a site contact familiar with the utilities on the property (e.g., plant manager, facility engineer, maintenance supervisor), and provide this individual with a site plan showing the proposed locations of all soil borings, monitoring wells, test pits, and other areas where intrusive activities will be conducted. These individuals often have knowledge of buried structures or process-specific utilities that may not be identified by the private utility locator. This is particularly important for work performed inside industrial buildings where reinforced concrete and other metallic components of the structure may interfere with the scanning devices used by the private utility locator. Ask the site contact for all drawings concerning underground utilities in the proposed work areas for future reference.

Keep in mind that no intrusive work may be done before the legal dig date provided by the state utility locating service and no digging, drilling, or other ground-breaking activities may be begin until all utilities on the list have been marked and visually verified in the work area (see below). It is **NOT ACCEPTABLE** to rely solely on as-built drawings or verbal utility clearances from the site contact (these should be used as guides only). A private locator may not be necessary in rare instances; however, nonconformity with the private locate requirement must be approved by the project manager **AND** a member of the ELT before work proceeds.

2.5 SITE MOBILIZATION PROCEDURES

Upon arrival, the first step in determining if you are clear of buried and overhead utilities is to locate all of the proposed drilling and trenching locations and mark them with (white) spray paint, stakes, or other appropriate markers. This will help you judge distances from marked utilities and minimizes any potential misunderstandings regarding the locations between you, the subcontractors (drillers, excavators, private utility locator), and the site contact.

Once you have the proposed work areas marked, verify that ALL utility companies listed by the state public utility locating service, and any contacted directly by the company or the contractor, have either marked the underground lines in the specified work areas or have responded (via telephone, facsimile, or e-mail) with “no conflict.” Document on the Utility Locating Form (Attachment 1) and in the field book as each utility mark is visually confirmed. When receiving verbal clearances by telephone from utility companies, or their subcontractors, it is imperative that you verify the utilities that are being cleared, particularly when dealing with subcontractors that may be marking more than one utility.

Review all available as-built utility diagrams and plans and conduct a site walk to identify potential areas where underground lines may be present; include the site contact in these activities. It is a good idea to survey your surroundings during the walk to identify any features that may indicate the presence of underground utilities, such as linear depressions in the ground, old road cuts, catch basins, or manholes. Keep in mind that many sewer lines can be offset from catch basins. The presence of aboveground utilities, such as parking lot lights or pad-mounted transformers, is also a good indicator of buried electrical lines. Check these items against the Utility Locating Form checklist and discuss the locations with the private utility locating service.

2.5.1 SAFE WORKING DISTANCES AND HAND CLEARING

A minimum of 4 feet clearance must exist between utilities and proposed drilling locations, and a minimum of 6 feet between utilities and proposed trenching locations. Be aware that some states and localities (e.g., New York City, Long Island) may require greater minimum working distances, depending on the utility (e.g., for high pressure gas mains). A minimum distance of 15 feet must be maintained by heavy equipment (e.g., excavator buckets, drill rig towers and rods) from overhead power lines and a safe distance of 25 feet must be maintained from high-tension overhead power lines. In the event that work must be conducted within 25 feet of high tension wires, the lines must be wrapped and insulated by the local utilities. Increase these minimum distances whenever possible to offer additional assurance that buried or overhead utilities will not be encountered.

If a utility conflict is identified within the minimum safe clearance distance, adjust the proposed location(s) using the criteria given above. It is recommended to have the private utility locator sweep a relatively large area (e.g., a 20-foot circle around a proposed drilling location) to provide room for adjustment should the proposed drilling or excavation area need to be moved to avoid a buried utility.

Uncertainty may exist in some circumstances (e.g., inside a building) even after the area has been swept for utilities. In these cases, advance the first few feet of a soil boring (or probe the area for excavation) using a hand auger or post-hole digger. If hand digging is unable to penetrate the subsurface soils, soft dig or air knife equipment service providers may be retained to clear the location. This equipment applies high pressure air to penetrate, loosen, and extract subsurface soils in the borehole, thereby safely exposing any utilities. If using either hand digging or soft digging, the probe hole should be advanced a minimum of 5 feet below ground surface at each proposed drilling or excavation location. Complete a sufficient number of probe holes so that the area is cleared for the proposed intrusive activity (i.e., use several holes for a proposed excavation). The use of hand digging or soft digging methods **does not** replace the need for state and private utility locating services.

2.5.2 EXPANDED WORK AREAS AND TICKET RENEWAL

Many projects begin with well-defined work areas only to expand quickly as the investigation or remediation progresses. If the scope of intrusion expands or includes new onsite or offsite area(s), you will need to review the existing ticket and work performed by the private utility locator to determine whether work can progress into the new area safely. It may be necessary, depending on the scope, to contact (or for the Contractor to contact) the state locating service and request another clearance for the new area(s) of investigation and retain a private locating service. Remember, the new request will provide a new legal dig date before which NO INTRUSIVE WORK CAN BEGIN. Additionally, if a clearance ticket will expire while the work is ongoing (typically after 2 weeks), a new clearance must be requested before the first ticket expires so that work can continue uninterrupted. Refer to the Utility Locating Form (Attachment 1) for the legal dig date time frame required by the state locating service.

2.5.3 UTILITY DAMAGE

It is possible, even if you followed all of the procedures outlined in this SOP, to damage an underground or overhead utility. Assuming it can be done safely, quickly turn off the drilling or excavating equipment, or move the equipment from the damaged line. Avoid contact with escaping liquids, live wires, and open flames. Abandon the equipment, evacuate the personnel from the area, and maintain a safe perimeter if there are any concerns about safety. If a fiber optic cable is damaged, do not handle the cable or look into the end of the cable as serious eye damage may occur. Once personnel are in a secure location, immediately notify the facility operator or site contact, 811, and the company's project manager. If the damaged utility has the potential to cause, or is causing, dangerous conditions, immediately notify the local emergency response number listed in your HASP.

** This form is mandatory for all intrusive work, regardless of who is responsible for the public and/or private locate.

Utility Locating Form

Project Name	Project No. and Task	Work being done for (Company or Individual Name)		Project Manager
Office Address	**Office Phone**	**Field Contact**		**Field Contact Phone**
Project Location: Street Address		**City/Township**	**County**	**State**
Nearest Intersecting Street				
Description of Work Area (street working on, which side of street, how far in which direction from nearest intersecting street; etc.)				
Type of Work	**Explosives (Y/N)**	**Directional Borings (Y/N)**	**Dig Locations Marked (Y/N)**	**Mark Type (e.g., stake)**
Scheduled Work Start (Date & Time)	**Estimated Work Stop Date**	**One-call Phone Number/Website Address**		**One-call Service Name**
Call/Web Notification Made By (Name, Title and Company)		**Date & Time of Call/Web Notification**		**Operator Name**
Ticket No.	**Legal Dig Date**	**Ticket Expiration Date**		**Ticket Renewal Date**

Utilities Notified		Complete After Receiving Notification (e.g., e-mail, facsimile) from Utilities or Subcontractor		
		Utilities Present (Y/N)	**Onsite Meeting (Y/N; if "Y" Date & Time)**	**Contact Name and Phone**
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Form Completed By (Signature)	
	(e-mail completed page 1 to Project Manager)

** This form is mandatory for all intrusive work, regardless of who is responsible for the public and/or private locate.

Private Utility Locator Information			
Company	**Contact Name**	**Phone**	**E-mail**
Who Contracted Locator?		**Scheduled Start (Date & Time)**	**Contract Executed (Y/N/NA)**

Onsite Visual Confirmation of Utilities			
Marking Color	**Utility Type and Visual Clues**	**Cleared or Marked (Y/N)**	**No Markings - Comments**
Blue	Potable water: fire hydrant, manholes; water meter, ASTs, interior connections, hose bib, valve box		
Yellow	Gas, oil steam, petroleum: gas meter, manholes; yellow bollards, interior connections, valve box		
Red	Electric power lines, lighting cables, parking lot lights, overhead lines (telephone poles), conduits: interior connections, underground vaults, manholes, transformers/switchgear, conduit on buildings		
Green	Sewer and drain lines: underground vaults, manholes, drain grates, leach field, sand mound, no evidence of sanitary sewer (for septic system)		
Orange	Communication, alarm or signal lines, cables or conduits: red/orange bollards, telephone poles, interior connections; manholes; conduit on buildings		
Purple	Reclaimed water, irrigation, and slurry lines: sprinkler heads, hose bibs		
Pink	Survey markings		
White	Proposed locations for excavation and drilling		

Project Manager Notified of any Conflicts? (Y/N)

Notes:

Marks Verified By (Signature)	
	(scan and save to client file)

FIELD STANDARD OPERATING PROCEDURE #3

SAMPLE PACKAGING AND SHIPMENT PROCEDURE

Shipping samples is a basic but important component of field work. The majority of field activities include the collection of environmental samples. Proper packing and preservation of those samples is critical to ensuring the integrity of our work product. The user is advised to read the entire standard operating procedure (SOP) and review the site health and safety plan (HASP) before beginning any onsite activities. In accordance with the HASP, proper personal protective equipment (PPE) must be selected and used appropriately.

3.1 ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
IATA	International Air Transport Association
HASP	Health and safety plan
PPE	Personal protective equipment
SOP	Standard operating procedure

3.2 MATERIALS

- Suitable shipping container (e.g., plastic cooler)
- Chain-of-custody forms
- Custody seals
- Sample container custody seals (as necessary)
- Mailing address labels (as necessary)
- Shipping form (with account number, as necessary)
- Tape (e.g., strapping, clear packing)
- Knife or scissors
- Permanent marker
- PPE
- Bubble wrap or other packing material

Temperature-preserved samples:

- Large plastic garbage bag
- Wet ice
- Heavy-duty zipper-style plastic bags
- Universal sorbent materials

Note: Some materials will be supplied by the laboratory, while others are must be supplied by the sampler. Confirm supplier of materials prior to mobilizing to the field.

3.3 PRECONDITIONS AND BACKGROUND

This SOP has been prepared as part of the company's Environmental Quality Management Plan and is designed to provide detailed procedures for common field practices. Compliance with the methods presented in this document is mandatory for all field

personnel and will ensure that the tasks are performed in a safe and consistent manner, are in accordance with federal and state guidance, and are technically defensible.

This SOP is written for the sole use of company employees and will be revised periodically to reflect updates to company policies, work practices, and the applicable state and/or federal guidance. Employees must verify that this document is the most recent version of the company SOPs. Employees are also strongly advised to review relevant state and/or federal guidance, which may stipulate program-specific procedures, in advance of task implementation.

This SOP is designed to provide the user with a general outline for shipping samples and assumes the user is familiar with basic field procedures, such as recording field notes (SOP 1), sample collection and quality assurance procedures (SOP 4), and investigation derived waste management procedures (SOP 5).

Most environmental samples are classified non-hazardous materials due to unknown characteristics and hazardous classes, however environmental samples can meet the definition of DOT hazardous materials when shipped by air, ground, or rail from a project site to the laboratory (e.g., free product, samples preserved with a hazardous material [TerraCore® samplers]). As such, field staff must work with their assigned company compliance professional to determine whether the sample shipment is subject to any specific requirements (e.g., packaging, marking, labeling, and documentation) under the DOT hazardous materials regulations.

3.4 SAMPLE SHIPMENT PROCEDURES

The two major concerns in shipping samples are incidental breakage during shipment and complying with applicable DOT and courier requirements for hazardous materials shipments.

> **NOTE: Many couriers, including Federal Express and UPS, have requirements that the company register with them before shipping hazard materials. In most cases, it is the sampling location, not the company office address, which needs to be registered. Therefore, each project will likely have unique requirements. Please contact your company compliance professional to determine whether or not you will be required to register for your shipment.**

Protecting the samples from incidental breakage can be achieved using "common sense." Pack all samples in a manner that will prevent them from moving freely about in the cooler or shipping container. Do not allow glass surfaces to contact each other. When possible, repack the sample containers in the same materials that they were originally received in from the laboratory. Cushion each sample container with plastic bubble wrap, styrofoam, or other nonreactive cushioning material. A more detailed procedure for packing environmental samples is presented below.

3.4.1 NON-HAZARDOUS MATERIAL ENVIRONMENTAL SAMPLES

The first step in preparing your samples for shipment is securing an appropriate shipping container. In most cases, the analytical laboratory will supply the appropriate container for bottle shipment, which can be used to return samples once they have been collected. Be sure that the container is large enough to contain the samples plus a sufficient amount of packing materials, and if applicable, enough wet ice to maintain the samples at the preservation temperature (usually 4 degrees Celsius). Use additional shipping containers as needed so that sample containers are protected from breakage due to overcrowding. Do not use lunch-box sized coolers or soft sided coolers, which do not offer sufficient insulation or protection from damage.

3.4.1.1 TEMPERATURE-PRESERVED SAMPLE CONTAINER PREPARATION

Temperature-preserved samples should be shipped to the laboratory in an insulated container (e.g., cooler). If using a plastic cooler with a drain, securely tape the inside of the drain plug with duct tape or other material to ensure that no water leaks from the cooler during shipment. Place universal sorbent materials (e.g., sorbent pads) in the bottom of the insulated container. The amount of sorbent material must be sufficient to absorb any condensation from the wet ice and a reasonable volume of water from melted wet ice (if a bag were to rupture) or a damaged (aqueous) sample container.

The next step is to line the insulated container with a large, heavy-duty plastic garbage bag. If shipping breakable sample containers (e.g., glass), place bubble wrap or other packing materials on the bottom of the container. Place the samples on the packing materials with sufficient space to allow for the addition of more bubble wrap or other packing material between the sample containers. Place large or heavy sample containers on the bottom of the cooler with lighter samples placed on top to minimize the potential for breakage. Place all sample containers in the shipping container right-side up. Do not overfill the cooler with samples; room must be left for a sufficient volume of wet ice. Wet ice must be double-bagged in heavy-duty zipper-style plastic bags (1 gallon-sized, or less); properly seal both bags before placing in the insulated container. Place the bags of ice on top of or between the samples. Place as much ice as possible into the cooler to ensure the samples arrive at the lab at the required preservation temperature, even if the shipment is delayed. Fill any remaining space in the container with bubble wrap or other packing material to limit the airspace and minimize the shifting of the sample containers and in-transit melting of ice. Securely close the top of the heavy-duty plastic bag and seal with tape.

3.4.1.2 NON-TEMPERATURE-PRESERVED SAMPLE CONTAINER PREPARATION

Non-temperature-preserved samples should be shipped to the laboratory in a durable package (e.g., hard plastic container or cardboard box). If shipping breakable sample containers (e.g., glass), place bubble wrap or other packing materials on the bottom of the container. Place the samples on the packing materials with sufficient space to allow for the addition of more bubble wrap or other packing material between and on top of the sample containers. Place large or heavy sample containers on the bottom of the container with lighter samples placed on top to minimize the potential for breakage. Place all sample containers within the shipping container right-side up. Fill any remaining space in the container with bubble wrap or other packing material to limit the airspace and minimize the shifting of the sample containers and in-transit melting of ice.

3.4.1.3 CONTAINER SHIPMENT

Place the original, white, top copy of the chain-of-custody form (i.e., laboratory copy) into a heavy-duty zipper-style plastic bag, affix/tape the bag to the shipping container's inside lid, and then close the shipping container. Only one chain-of-custody form is required to accompany one of the shipping containers per sample shipment; the other coolers in the shipment do not need to include chain-of-custody forms. At this point, sample shipment preparations are complete if using a laboratory courier.

Once the shipping container is sealed, shake test the shipping container to make sure that there are no loose sample containers. If loose sample containers are detected, open the shipping container, repack the contents, and reseal the shipping container. If sending the sample shipment through a commercial shipping vendor, place two signed and dated chain-of-custody seals on alternate sides of the shipping container lid so that it cannot be opened without breaking the seals. Securely fasten the top of the shipping container shut with clear packing tape; carefully tape over the custody seals to prevent damage during shipping.

Using clear tape, affix a mailing label with the company's return address to the top of the shipping container. Ship environmental samples to the contracted analytical laboratory using an appropriate delivery schedule. If applicable, check the appropriate box on the airbill for Saturday delivery (you need to verify with the laboratory that someone will be at the laboratory on a Saturday to receive the sample shipment). Declare the value of samples on the shipping form for insurance purposes, if applicable, and be sure to include the project billable number on the shipping form's internal billing reference section. When shipping samples to a lab, identify a declared value equal to the carrier's default value ($100); additional fees will be charged based on a higher value declared. Our preferred carrier, Federal Express, will only reimburse for the actual value of the cooler and its contents if a sample shipment is lost; they will not reimburse for the cost of having to re-collect the samples. [Please note: if you are shipping something other than samples, such as field equipment, declare the replacement value of the contents.]

Record the tracking numbers from the shipping company forms (i.e., the airbill number) in the field book and retain a copy of the shipping airbill. On the expected delivery date, confirm sample receipt by contacting the laboratory or tracking the package using the tracking number; provide this confirmation information to the project manager.

NOTE: Most shipping carriers adhere to transit schedules with final pickup times each day; these schedules are subject to change and vary by service location. If shipping containers are dropped off at a service location after the final pickup time, transit to the laboratory will not be initiated until the following day, and samples may not be properly preserved. Therefore, confirm transit schedules in advance of each sampling event, and ensure samples are dropped off before the final pickup time of the day.

3.4.2 HAZARDOUS MATERIALS SAMPLES

Employees rarely ship hazardous materials due to DOT shipping requirements. If you find that your samples could be considered a DOT hazardous material, first coordinate with the assigned company compliance professional and project manager to make a hazardous material classification and, if necessary, establish the necessary protocols and to receive the appropriate training/certification.

NOTE: Employees shipping samples regulated as hazardous materials or exempt hazardous materials by air must have International Air Transport Association (IATA) training. IATA training is a separate training required in addition to DOT hazardous materials training for such shipments. Most of our employees do not have IATA training and therefore, anyone who needs to ship by air MUST consult with a company IATA-trained compliance professional.

APPENDIX

C BORING LOGS

Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-18
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/12/2018	Drill End Date: 2/12/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 731

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
				96	2		***ORGANIC SOIL (ol/oh)*** Dark brown; moist; (Fill material). 1
2	729						***WELL-GRADED SAND WITH GRAVEL (sw)*** Brown; fine- to coarse-grained sand; about 20% fine-grained gravel; dry; few organics; (Fill material). 3.5
4	727			96	1		***SANDY ORGANIC SOIL (ol/oh)*** Black; moist; (Fill material). 4.6
6	725			50	3		***SILTY SAND (sm)*** Dark yellowish brown; fine-grained sand; about 20% silty fines; about 5% fine-grained gravel; moist;(Fill material). Granite cobble at 5 feet bgs.
8	723						
10	721						*Bottom of boring at 10 feet.* 10
12	719						
14	717						
16	715						
18	713						
20	711						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-19
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/12/2018	Drill End Date: 2/12/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 727

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
							ORGANIC SOIL (ol/oh) Dark brown; moist; (Fill material). 0.8
2	725			80	2		***SILTY SAND (sm)*** Dark yellowish brown; fine- to coarse-grained sand; about 20% silty fines; about 10% fine- to coarse-grained gravel; moist; (Fill material).
4	723			80	2		Dark grayish brown with some gravel at 4.6 - 4.8 feet bgs. Silt content increasing from 5 - 5.5 feet bgs. 5.5
6	721			80	2		***SANDY SILT (ml)*** Dark yellowish brown; medium stiff, nonplastic; about 35% fine-grained sand; moist; trace coarse-grained sand to fine-grained gravel; (Fill material). 7
8	719			80	2		***WELL-GRADED SAND (sw)*** Dark yellowish brown; fine- to coarse-grained sand; about 10% fine- to coarse-grained gravel; about 10% silty fines; moist; (Native material). Broken cobble clast at 9 feet bgs. 9.4
10	717						***SILT (ml)*** Dark yellowish brown; stiff, low plasticity; about 5% fine-grained sand; moist; (Native material). 10 *Bottom of boring at 10 feet.*
12	715						
14	713						
16	711						
18	709						
20	707						

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Project Name: I-35W Minnesota River Bridge	**Client:** MnDOT	**Location:** Burnsville, MN	**Boring Log:** DP-20
Drilled By: Dakota Technologies/Logan	**Drill Start Date:** 2/12/2018	**Drill End Date:** 2/12/2018	**Drill Method:** Direct Push
Logged By: Kevin Walter	**Total Depth (ft):** 10	**Bore Diameter (in):** 2	**Ground Surface (ft-msl):** 725

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Recovery (%)	PID (ppm)	Physical Description
				Ground Surface
		100	0	***SANDY ORGANIC SOIL (ol/oh)*** Very dark grayish brown; moist; (Fill material).
				1.4
2	723			***WELL-GRADED SAND WITH GRAVEL (sw)*** Dark yellowish brown; fine- to coarse-grained sand; about 20% fine- to coarse-grained gravel; about 10% silty fines; moist; (Fill material); (Fill material).
				3
		100	0	***POORLY-GRADED SAND (sp)*** Pale brown; fine-grained sand; moist; (Fill material).
				3.5
4	721			***WELL-GRADED SAND WITH SILT (sw-sm)*** Dark yellowish brown; fine- to coarse-grained sand; about 10% fine-grained gravel; about 10% silty fines; moist; (Fill material).
				4.5
				SILTY SAND (sm) Dark yellowish brown; fine- to coarse-grained sand; about 20% silty fines; about 10% fine-grained gravel; moist; (Fill material).
6	719			6
				Granite cobble at 6 feet bgs.
		50	1	***SILT (ml)*** Black; soft, low plasticity; about 5% fine-grained gravel; about 5% fine- to coarse-grained sand; moist; little organics; (Native material).
8	717			8.6
				SILTY SAND (sm) Dark yellowish brown; fine- to coarse-grained sand; about 40% silty fines; moist; (Native material).
				9.5
10	715			***SILT (ml)*** Yellowish brown; medium stiff, low plasticity; about 10% fine- to coarse-grained sand; moist; (Native material).
				10
12	713			*Bottom of boring at 10 feet.*
14	711			
16	709			
18	707			
20	705			

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-21
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/10/2018	Drill End Date: 2/10/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 720

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
				80	1		***SANDY ORGANIC SOIL (ol/oh)*** Dark grayish brown; moist; few fine-grained gravel at 1.7 - 2 feet bgs; (Fill material).
2	718						2
							WELL-GRADED SAND (sw) Brown; fine- to coarse-grained sand; about 10% fine-grained gravel; moist; (Fill material). 2.4
				80	1		***SANDY SILT (ml)*** Dark grayish brown; soft, nonplastic; moist; (Fill material). 3
4	716						***POORLY-GRADED SAND WITH SILT (sp-sm)*** Yellowish brown; fine- to medium-grained sand; about 10% silty fines; about 5% fine-grained; moist; (Fill material).
				88	1		Color transitions to dark yellowish brown at 5 feet bgs.
6	714						Little silt at 6 - 6.5 feet bgs; coarse-grained gravel clast at 6.5 feet bgs.
8	712			88	2		9.3
							SANDY LEAN CLAY (cl) Dark grayish brown; stiff, low plasticity; about 30% fine- to coarse-grained sand; about 10% fine-grained gravel; moist; (Native material). 10
10	710						*Bottom of boring at 10 feet.*
12	708						
14	706						
16	704						
18	702						
20	700						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-22
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/10/2018	Drill End Date: 2/10/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 712

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
				86	1		***SANDY ORGANIC SOIL (ol/oh)*** Dark grayish brown; moist; (Fill material). 1
							WELL-GRADED SAND WITH GRAVEL (sw) Dark brown; fine- to coarse-grained sand; about 40% fine- to coarse-grained gravel; (Fill material). 2
2	710						
				86	2		***WELL-GRADED SAND (sw)*** Dark yellowish brown; fine- to coarse-grained sand; about 10% fine- to coarse-grained gravel; moist; trace fine-grained gravel and few fines after 5 feet bgs; (Fill material).
4	708						
				60	3		7.8
6	706						
8	704						***SILTY SAND (sm)*** Yellowish brown; fine-grained sand; about 40% silty fines; moist; (Native material). 8.3
							SILTY SAND (sm) Dark brown; fine- to medium-grained sand; about 20% silty fines; about 5% fine-grained gravel; moist; (Native material). 10
10	702						*Bottom of boring at 10 feet.*
12	700						
14	698						
16	696						
18	694						
20	692						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-23
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/10/2018	Drill End Date: 2/10/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 713

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
2	711			96	0		***SANDY ORGANIC SOIL (ol/oh)*** Brown; about 25% fine- to coarse-grained sand; about 20% fine-grained gravel; moist; (Fill material). 0.75
4	709			96	0		***WELL-GRADED SAND WITH SILT (sw-sm)*** Dark yellowish brown; fine- to coarse-grained sand; about 10% silty fines; about 5% fine-grained gravel; moist; (Fill material). Few fine-grained gravel to 2 feet bgs. 4.2
6	707			80	1		***SILT WITH SAND (ml)*** Yellowish brown; medium stiff, nonplastic; about 25% fine-grained sand; moist; (Fill material). 5.5
8	705			80	0		***POORLY-GRADED SAND (sp)*** Dark yellowish brown; fine- to medium-grained sand; about 5% fine-grained gravel; moist; few fines to 7 feet bgs; (Native material).
10	703						*Bottom of boring at 10 feet.* 10
12	701						
14	699						
16	697						
18	695						
20	693						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-24
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/11/2018	Drill End Date: 2/11/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 27	Bore Diameter (in): 2	Ground Surface (ft-msl): 717

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 19.5 feet bgs.

Depth (ft)	Elevation (ft-msl)	Recovery (%)	PID (ppm)	Physical Description
				Ground Surface
				SILT WITH GRAVEL (ml) Yellowish brown; medium stiff, nonplastic; about 20% fine-grained gravel; moist; (Fill material). 0.5
				ASPHALT (Fill material). 0.75
2	715	100	4	***POORLY-GRADED SAND WITH SILT (sp-sm)*** Dark brown; fine-grained sand; about 10% silty fines; about 5% fine-grained gravel; moist; (Fill material).
4	713	100	3	Color transitions to grayish brown at 5 feet bgs. Coarsens to fine- to medium-grained sand at 5.5 feet bgs.
6	711	50	4	6 ***WELL-GRADED SAND WITH SILT (sw-sm)*** Grayish brown; fine- to coarse-grained sand; about 10% fine- to coarse-grained gravel; about 10% silty fines; moist; (Native material).
8	709			Color transitions to yellowish brown at 9.8 feet bgs.
10	707	60	4	10 ***SILT WITH GRAVEL (ml)*** Light gray; nonplastic; about 20% fine- to coarse-grained gravel; moist; (Native material).
12	705			12 ***SILT WITH SAND (ml)*** Dark brown; nonplastic; about 20% fine- to coarse-grained sand; about 5% fine-grained gravel; moist; few organics; sand lenses at 13 and 13.5 feet bgs; (Native material).
14	703			
16	701	40	4	15 ***SANDY SILT (ml)*** Dark brown; soft, nonplastic; about 30% fine- to coarse-grained sand; about 10% fine-grained gravel; moist; few organics; color transitions to black at 17 feet bgs (Native material).
18	699			Color transitions to very dark grayish brown at 20 feet bgs.
20	697			

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-24

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 19.5 feet bgs.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
22	695			40	8		21.7 ***WELL-GRADED SAND WITH SILT (sw-sm)*** Dark yellowish brown; fine- to coarse-grained sand; about 10% silty fines, ; about 5% fine-grained gravel; moist; about 10% silty fines; about 5% fine-grained gravel; moist; wet at 22 feet bgs; (Native material). Little silt to 23 feet bgs
24	693						
26	691			50	5		Coarse-grained gravel clast at 25.5 feet bgs; (Native material). 27
28	689						*Bottom of boring at 27 feet.*
30	687						
32	685						
34	683						
36	681						
38	679						
40	677						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-25
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/12/2018	Drill End Date: 2/12/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 23	Bore Diameter (in): 2	Ground Surface (ft-msl): 714

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 17.6 feet bgs.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
				100	6		***SANDY ORGANIC SOIL (ol/oh)*** Dark brown; moist; (Fill material). — 1
2	712						***SILTY SAND (sm)*** Dark yellowish brown; fine- to coarse-grained sand; about 20% silty fines; about 10% fine- to coarse-grained gravel; moist; (Fill material).
				100	8		
4	710						
							— 5.5
6	708						***SILTY SAND (sm)*** Yellowish brown; fine-grained sand; about 30% silty fines; moist; (Fill material). — 6.5
				56	3		***SILTY SAND (sm)*** Dark yellowish brown; fine- to coarse-grained sand; about 20% silty fines; about 10% fine- to coarse-grained gravel; moist; (Fill material).
8	706						
10	704			80	3		
12	702						— 12
							POORLY-GRADED SAND (sp) Gray; fine- to medium-grained sand; moist; (Fill material). — 12.5
				80	6		***POORLY-GRADED SAND (sp)*** Dark yellowish brown; fine-grained sand; about 5% fine- to coarse-grained gravel; moist; few medium- to coarse-grained sand; few silty fines; (Native material).
14	700						— 15
				70	7		***SANDY SILT (ml)*** Dark yellowish brown; stiff, low plasticity; about 30% fine-grained sand; about 5% fine-grained gravel; moist; trace coarse-grained sand; color transitions to dark grayish brown at 15.5 feet bgs; (Native material).
16	698						— 17
				70	7		***WELL-GRADED SAND (sw)*** Dark yellowish brown; fine- to coarse-grained sand; about 10% silty fines; about 5% fine-grained gravel; wet; (Native material).
18	696						
20	694						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-25

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 17.6 feet bgs.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
22	692			67	9		***WELL-GRADED SAND (sw)*** Dark yellowish brown; fine- to coarse-grained sand; about 10% silty fines; about 5% fine-grained gravel; wet; (Native material). *(continued)*
							23
							Bottom of boring at 23 feet.
24	690						
26	688						
28	686						
30	684						
32	682						
34	680						
36	678						
38	676						
40	674						

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Project Name: I-35W Minnesota River Bridge	**Client:** MnDOT	**Location:** Burnsville, MN	**Boring Log:** DP-26
Drilled By: Dakota Technologies/Logan	**Drill Start Date:** 2/11/2018	**Drill End Date:** 2/11/2018	**Drill Method:** Direct Push
Logged By: Kevin Walter	**Total Depth (ft):** 20	**Bore Diameter (in):** 2	**Ground Surface (ft-msl):** 712

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 17.8 feet bgs.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
2	710			0			Direct drilled top three feet to avoid liner recovery issues (Fill material).
							3
4	708			100	0		***POORLY-GRADED SAND (sp)*** Grayish brown; fine-grained sand; about 10% silty fines; moist; (Fill material).
							5.7
6	706						***SILTY SAND (sm)*** Light gray; medium-grained sand; about 20% silty fines; about 10% fine-grained gravel; wet; (Fill material).
8	704			44	2		
							9
10	702						***SILTY SAND WITH GRAVEL (sm)*** Very dark grayish brown; fine- to medium-grained sand; about 30% silty fines; about 20% fine- to coarse-grained gravel; moist; (Fill material).
							10.3
12	700			46	1		***SILTY SAND (sm)*** Very dark grayish brown; fine- to coarse-grained sand; about 20% silty fines; about 10% fine-grained gravel; moist; (Fill material).
							13
14	698						***SILT (ml)*** Black; medium stiff, low plasticity; moist; organic-type odor; (Native material).
							15
16	696						***SILTY SAND (sm)*** Very dark grayish brown; fine- to coarse-grained sand; about 20% silty fines; about 10% fine-grained gravel; moist becoming wet at 16 feet bgs (Native material). Black silt lenses at 17 - 17.2 and 17.5 - 17.7 feet bgs..
18	694			50	2		
							18
							POORLY-GRADED SAND (sp) Yellowish brown; fine-grained sand; about 10% silty fines; trace coarse-grained sand to fine-grained gravel; wet; (Native material).
20	692						20
							Bottom of boring at 20 feet.

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-27
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/11/2018	Drill End Date: 2/11/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 25	Bore Diameter (in): 2	Ground Surface (ft-msl): 714

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 17.6 feet bgs.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
				80	0		***ASPHALT*** (Fill material). 0.5
2	712						***SILTY SAND WITH GRAVEL (sm)*** Light yellowish brown; fine- to coarse-grained sand; about 30% silty fines; about 20% fine-grained gravel; moist; (Fill material). 2
				100	0		***POORLY-GRADED SAND (sp)*** Dark grayish brown; fine-grained sand; about 10% silty fines; moist; wet from 3.5 - 5 feet bgs; (Fill material).
4	710						Color transitions to very dark grayish brown at 4 feet bgs.
							Color transitions to dark gray at 5 feet bgs.
6	708						
				50	1		7
8	706						***SILTY SAND (sm)*** Black; fine- to coarse-grained sand; about 30% silty fines; about 10% fine- to coarse-grained gravel; moist; (Fill material).
10	704						10
				50	1		***SILT (ml)*** Black; soft, low to medium plasticity; moist; few organics; (Fill material).
12	702						Grayish brown well-graded sand with gravel lens from 14.3 - 15 feet bgs.
14	700						Few fine-grained gravel after 15 feet bgs.
16	698						16.3
				50	1		***WELL-GRADED SAND WITH GRAVEL (sw)*** Dark grayish brown; fine- to coarse-grained sand; about 15% fine-grained gravel; moist becoming wet at 19 feet bgs; (Native material).
18	696						
20	694						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-27

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 17.6 feet bgs.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							20
							SILTY SAND (sm) Dark yellowish brown; fine-grained sand; about 30% silty fines; moist; (Native material). 20.5
22	692			60	0		***SILT (ml)*** Yellowish brown; medium stiff, low plasticity; about 15% fine-grained sand; moist; sand increasing to some sand by 22 feet bgs; (Native material). 22
24	690						***SILTY SAND WITH GRAVEL (sm)*** Dark yellowish brown; fine- to coarse-grained sand; about 20% fine- to coarse-grained gravel; about 20% silty fines; moist; wet from 22.5 - 24.5 feet bgs (Native material). Black silt lens at 24.5 - 24.7 feet bgs. 25
26	688						*Bottom of boring at 25 feet.*
28	686						
30	684						
32	682						
34	680						
36	678						
38	676						
40	674						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-28
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/11/2018	Drill End Date: 2/11/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 19	Bore Diameter (in): 2	Ground Surface (ft-msl): 710

Notes: All soil classifications based on visual descriptions made during the installation of the boring. Depth to water measured at 18.2 feet bgs.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
2	708			0			Sample liner stuck in casing, sand found in drill shoe (Fill material).
4	706						
5							
6	704						***POORLY-GRADED SAND (sp)*** Bluish gray; fine-grained sand; about 10% silty fines; wet; saturated conditions may be the result of surface water infiltrating during drilling; (Fill material).
6.5							
8	702			44	2		***WELL-GRADED SAND (sw)*** Brownish gray; very fine- to medium-grained sand; about 10% silty fines; moist; (Fill material).
10	700						Minimal recovery from 10 - 15 feet bgs due to gravel stuck in liner; wet from 10 - 15 feet bgs (may be due to surface water).
12	698			8	1		
14	696						
15							
16	694			34	2		***WELL-GRADED SAND WITH SILT (sw-sm)*** Grayish brown; fine- to coarse-grained sand; about 25% silty fines; about 10% fine- to coarse-grained gravel; wet; (Fill material). Silt lens from 16 - 16.3 feet bgs; small (<1-inch) intermittent silt lenses from 17 - 18 feet bgs.
18	692						
18							***SILT WITH SAND (ml)*** Very dark grayish brown; stiff, low plasticity; about 25% fine-grained sand; moist; (Native material).
19							
20	690						*Bottom of boring at 19 feet. Boring terminated at refusal.*

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-29
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 706

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
							ASPHALT (Fill material). 0.5
							WELL-GRADED SAND WITH GRAVEL (sw) Pale brown; medium- to coarse-grained sand; about 40% fine-grained gravel; dry; (Fill material). 1
2	704			84	2		***SANDY SILT (ml)*** Dark grayish brown; about 55% silty fines, hard, nonplastic; about 35% fine-grained sand; about 10% fine-grained gravel; dry; (Native material).
4	702						4.1
							LEAN CLAY (cl) Black; medium stiff, medium plasticity; about 10% fine-grained sand; moist; few organics; (Native material).
6	700			76	3		
8	698						9.2
10	696						***WEATHERED BEDROCK*** Yellowish brown; fine- to coarse-grained gravel; dry; (Native material). 10
							Bottom of boring at 10 feet.
12	694						
14	692						
16	690						
18	688						
20	686						

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Project Name: I-35W Minnesota River Bridge	**Client:** MnDOT	**Location:** Burnsville, MN	**Boring Log:** DP-30
Drilled By: Dakota Technologies/Logan	**Drill Start Date:** 2/1/2018	**Drill End Date:** 2/1/2018	**Drill Method:** Direct Push
Logged By: Kevin Walter	**Total Depth (ft):** 10	**Bore Diameter (in):** 2	**Ground Surface (ft-msl):** 709

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Recovery (%)	PID (ppm)	Physical Description
				Ground Surface
				ASPHALT (Fill material). — 0.5
				WELL-GRADED SAND WITH GRAVEL (sw) Very dark grayish brown; fine- to coarse-grained sand; about 20% fine-grained gravel; dry; (Fill material). — 1.5
2	707	60	1	***SANDY LEAN CLAY WITH GRAVEL (cl)*** Brown; about 60% clayey fines, stiff, nonplastic; about 30% fine- to coarse-grained sand; about 10% fine-grained gravel; dry; (Fill material).
4	705			— 4
				SILT WITH SAND (ml) Very dark grayish brown to black; soft, low plasticity; about 20% fine-grained sand; moist; few organics; (Native material).
6	703			
		80	1	— 7.5
8	701			***WEATHERED BEDROCK*** Yellowish brown; dry; decomposed limestone-type bedrock; (Native material).
10	699			— 10
				Bottom of boring at 10 feet.
12	697			
14	695			
16	693			
18	691			
20	689			

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-31
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 711

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
							SILTY SAND (sm) Brown; fine- to coarse-grained sand; about 40% silty fines; about 5% fine-grained gravel; dry; (Fill material).
							1.5
2	709			44	3		***SILT (ml)*** Brownish gray; soft, nonplastic; about 10% fine-grained sand; moist; few organics; wet at 3.5 feet bgs; (Native material).
4	707						
6	705			50	3		6
							ORGANIC SOIL (ol/oh) Dark reddish brown; soft; moist; (Native material).
8	703						8
							WEATHERED BEDROCK Yellowish brown; dry; heavily weathered bedrock; powdered consistency with rock clasts; (Native material).
10	701						10
							Bottom of boring at 10 feet.
12	699						
14	697						
16	695						
18	693						
20	691						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-32
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 713

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
							ASPHALT (Fill material). 0.5
2	711			36	2		***SILTY SAND WITH GRAVEL (sm)*** Dark grayish brown; fine- to coarse-grained sand; about 40% silty fines; about 10% fine-grained gravel; dry; (Native material).
4	709						
							5
6	707			80	1		***SILT (ml)*** Dark gray; soft, low plasticity; about 10% fine-grained sand; wet; few organics at 9 feet bgs; (Native material).
8	705						
							9.6
10	703						***WEATHERED BEDROCK*** Gray; (Native material). 10
							Bottom of boring at 10 feet.
12	701						
14	699						
16	697						
18	695						
20	693						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-33
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 713

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
							ASPHALT (Fill material). 0.3
							SILTY SAND (sm) Dark brown; fine- to coarse-grained sand; about 40% silty fines; about 10% fine-grained gravel; dry; (Fill material). 1
2	711			60	2		***WEATHERED ROCK*** Yellowish brown; dry; weathered rock; powdered consitency with rock clasts; (Fill material). 1.5
							SANDY SILT (ml) Dark grayish brown; stiff, nonplastic; about 30% fine- to coarse-grained sand; about 10% fine-grained gravel; dry; (Fill material). 3
4	709						4
							SILT (ml) Dark reddish brown; soft, nonplastic; moist; few organics; (Fill material). 4.5
6	707						***SILT (ml)*** Gray; soft, low plasticity; about 20% fine-grained sand; wet; (Native material).
				76	2		***ORGANIC SOIL (ol/oh)*** Dark reddish brown; soft, nonplastic; moist; (Native material).
8	705						8.8
							SANDY FAT CLAY (ch) Greenish gray; high plasticity; about 30% fine-grained sand; about 10% fine-grained gravel; moist; (Native material). 9.5
10	703						10
							WEATHERED BEDROCK Gray; dry; powdered consistency with rock clasts; (Native material).
							Bottom of boring at 10 feet.
12	701						
14	699						
16	697						
18	695						
20	693						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-34
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 711

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
							SANDY ORGANIC SOIL (ol/oh) 0.3 Brown; (Fill material).
							1 ***WELL-GRADED SAND WITH GRAVEL (sw)*** Yellowish brown; fine- to coarse-grained sand; about 20% fine-grained gravel; dry; asphalt pieces at 0.7 - 1 foot bgs; (Fill material).
2	709			76	5		***SANDY SILT (ml)*** Dark brown; medium stiff, nonplastic; about 30% fine- to coarse-grained sand; about 10% fine- to coarse-grained gravel; moist; few organics; (Native material).
4	707						
6	705						
				70	5		
8	703						20% fine- to coarse-grained gravel at 7.5 - 9.3 feet bgs.
							9.3 ***FAT CLAY (ch)*** Greenish gray; medium stiff, high plasticity; moist; organic-type odor; few to little organics; (Native material). 10
10	701						*Bottom of boring at 10 feet.*
12	699						
14	697						
16	695						
18	693						
20	691						

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Project Name: I-35W Minnesota River Bridge	**Client:** MnDOT	**Location:** Burnsville, MN	**Boring Log:** DP-35
Drilled By: Dakota Technologies/Logan	**Drill Start Date:** 2/1/2018	**Drill End Date:** 2/1/2018	**Drill Method:** Direct Push
Logged By: Kevin Walter	**Total Depth (ft):** 10	**Bore Diameter (in):** 2	**Ground Surface (ft-msl):** 712

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
2	710			70	2		***WELL-GRADED SAND WITH GRAVEL (sw)*** Yellowish brown; fine- to coarse-grained sand; about 40% fine-grained gravel; dry; (Fill material). 0.8 ***POORLY-GRADED SAND (sp)*** Dark yellowish brown; fine-grained sand; about 10% silty fines, ; about 5% fine-grained gravel; moist; about 10% silty fines; about 5% fine-grained gravel; trace coarse-grained sand; moist; (Native material).
4	708						Little clay at 3.5 - 4 feet bgs; coarsens to fine- to medium-grained sand at 4 feet bgs. Wet from 5 - 6 feet bgs; (Native material).
6	706						6.5
8	704			70	3		***SANDY SILT (ml)*** Dark grayish brown; low plasticity; about 30% fine- to coarse-grained sand; about 10% fine- to coarse-grained gravel; moist; (Native material). Color transitions to very dark grayish brown at 8 feet bgs.
10	702						9.5 ***SILT (ml)*** Pale brown; soft, nonplastic; moist. 10 *Bottom of boring at 10 feet.*
12	700						
14	698						
16	696						
18	694						
20	692						

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-36
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 711

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
							SANDY ORGANIC SOIL (ol/oh) Brown; (Fill material). 0.5
2	709			50	0		***POORLY-GRADED SAND (sp)*** Dark yellowish brown; fine-grained sand; about 10% clayey fines; about 5% fine-grained gravel; moist; (Native material). Little fine-grained gravel at 0.5 - 1 foot bgs. Little clay from 3.8 - 4.2 feet bgs; sand coarsens to fine- to medium-grained sand at 4 feet bgs.
4	707						
6	705			70	0		5.5 ***SANDY SILT WITH GRAVEL (ml)*** Dark grayish brown; about 25% fine- to coarse-grained sand; about 20% fine- to coarse-grained gravel; color olive brown from 6 - 7 feet bgs; rock clasts at bottom; (Native material).
8	703						
10	701						10 *Bottom of boring at 10 feet.*
12	699						
14	697						
16	695						
18	693						
20	691						

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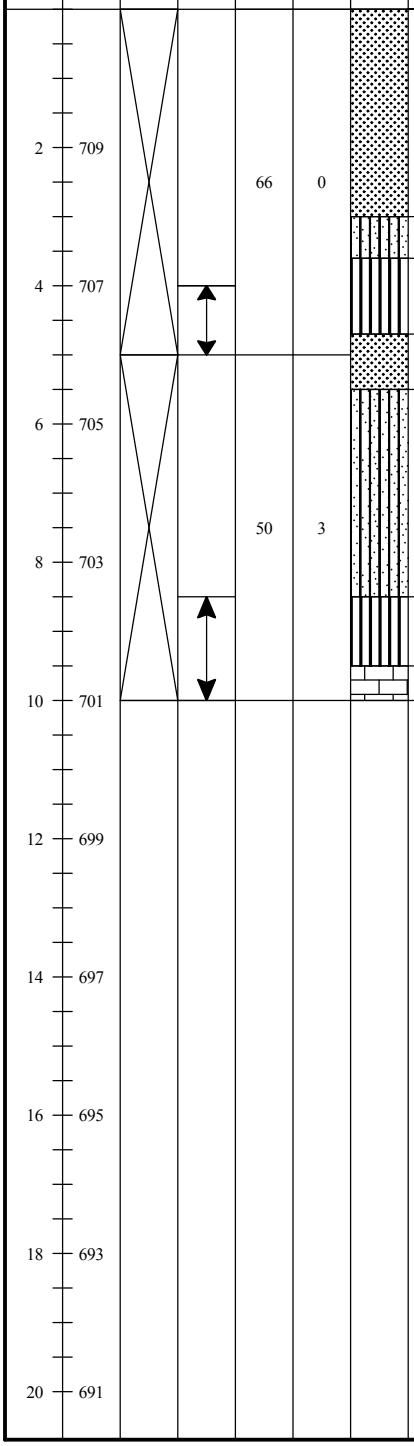
Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-37
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 711

Notes: All soil classifications based on visual descriptions made during the installation of the boring.



Physical Description	
Ground Surface	
WELL-GRADED SAND (sw) Yellowish brown; fine- to coarse-grained sand; about 10% fine-grained gravel; about 10% silty fines; moist; (Fill material).	3
SILTY SAND (sm) Dark yellowish brown; fine- to coarse-grained sand; about 25% silty fines; about 10% fine-grained gravel; moist; (Native material).	3.6
SANDY SILT (ml) Dark yellowish brown; medium stiff, nonplastic; about 40% fine-grained sand; moist; color transitions to grayish brown at 4 feet bgs; (Native material).	4.7
WELL-GRADED SAND (sw) Very dark grayish brown; fine- to coarse-grained sand; about 10% fine-grained gravel; dry; (Native material).	5.5
SILTY SAND (sm) Very dark grayish brown; fine-grained sand; about 20% silty fines; few medium- to coarse-grained sand; wet; (Native material).	8.5
SANDY SILT (ml) Very dark grayish brown; medium stiff, low plasticity; about 40% fine-grained sand; moist; (Native material).	9.5
WEATHERED BEDROCK Gray; dry; silt-sized particles with gravel clasts; (Native material).	10
Bottom of boring at 10 feet.	

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Project Name: I-35W Minnesota River Bridge	Client: MnDOT	Location: Burnsville, MN	Boring Log: DP-38
Drilled By: Dakota Technologies/Logan	Drill Start Date: 2/1/2018	Drill End Date: 2/1/2018	Drill Method: Direct Push
Logged By: Kevin Walter	Total Depth (ft): 10	Bore Diameter (in): 2	Ground Surface (ft-msl): 713

Notes: All soil classifications based on visual descriptions made during the installation of the boring.

Depth (ft)	Elevation (ft-msl)	Sample Type	Lab Sample Interval	Recovery (%)	PID (ppm)	Graphic Log	Physical Description
							Ground Surface
2	711			80	3		***WELL-GRADED SAND WITH SILT AND GRAVEL (sw-sm)*** Brownish yellow; fine- to coarse-grained sand; about 20% fine-grained gravel; about 20% silty fines; dry; (Fill material). Very dense at 1 - 2 feet bgs.
							2.5
4	709						***WELL-GRADED SAND WITH SILT AND GRAVEL (sw-sm)*** Very dark grayish brown; fine- to coarse-grained sand; about 20% fine-grained gravel; moist; about 20% silty fines; moist; (Native material). Very dense at 3.5 - 4 feet bgs. Little organics from 4 - 6 feet bgs; (Native material).
6	707			50	1		6 ***WELL-GRADED SAND WITH SILT AND GRAVEL (sw-sm)*** Very dark grayish brown; fine- to coarse-grained sand; about 20% silty fines; about 10% fine-grained gravel; moist; (Native material).
8	705						8 ***WEATHERED BEDROCK*** Gray; dry; powdered consistency with rock clasts (Native material). Greenish gray, clayey, and moist from 8 - 8.5 feet bgs.
10	703						10 *Bottom of boring at 10 feet.*
12	701						
14	699						
16	697						
18	695						
20	693						

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APPENDIX

D SOIL AND GROUNDWATER LABORATORY ANALYTICAL REPORTS

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

February 08, 2018

Ms. Paula Berger
WSP Environment and Energy
123 North Third Street
Suite 808
Minneapolis, MN 55401

RE: Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Dear Ms. Berger:
Enclosed are the analytical results for sample(s) received by the laboratory on February 02, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

Pace Analytical Services, LLC
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Minneapolis, MN 55414
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CERTIFICATIONS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
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 #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
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 NwTPH 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
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10419237001	**DP-30 (2-3)**	Solid	02/01/18 09:10	02/02/18 13:45
10419237002	**DP-30 (9-10)**	Solid	02/01/18 09:20	02/02/18 13:45
10419237003	**DP-29 (2-3)**	Solid	02/01/18 09:45	02/02/18 13:45
10419237004	**DP-29 (8.5-10)**	Solid	02/01/18 10:00	02/02/18 13:45
10419237005	**DP-31 (4-5)**	Solid	02/01/18 10:20	02/02/18 13:45
10419237006	**DP-31 (9-10)**	Solid	02/01/18 10:25	02/02/18 13:45
10419237007	**DP-32 (4-5)**	Solid	02/01/18 10:35	02/02/18 13:45
10419237008	**DP-32 (9-10)**	Solid	02/01/18 10:40	02/02/18 13:45
10419237009	**DP-33 (4-5)**	Solid	02/01/18 10:50	02/02/18 13:45
10419237010	**DP-33 (8.5-10)**	Solid	02/01/18 11:00	02/02/18 13:45
10419237011	**DP-34 (2-3)**	Solid	02/01/18 13:05	02/02/18 13:45
10419237012	**DP-34 (9-10)**	Solid	02/01/18 13:10	02/02/18 13:45
10419237013	**DP-35 (2-3)**	Solid	02/01/18 13:30	02/02/18 13:45
10419237014	**DP-35 (8.5-9.5)**	Solid	02/01/18 13:40	02/02/18 13:45
10419237015	**DP-36 (4-5)**	Solid	02/01/18 13:55	02/02/18 13:45
10419237016	**DP-36 (9-10)**	Solid	02/01/18 14:05	02/02/18 13:45
10419237017	**DP-37 (4-5)**	Solid	02/01/18 14:20	02/02/18 13:45
10419237018	**DP-37 (8.5-10)**	Solid	02/01/18 14:40	02/02/18 13:45
10419237019	**DP-38 (4-5)**	Solid	02/01/18 15:00	02/02/18 13:45
10419237020	**DP-38 (7-8.5)**	Solid	02/01/18 15:10	02/02/18 13:45

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10419237001	**DP-30 (2-3)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237002	**DP-30 (9-10)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237003	**DP-29 (2-3)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237004	**DP-29 (8.5-10)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237005	**DP-31 (4-5)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237006	**DP-31 (9-10)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237007	**DP-32 (4-5)**	WI MOD DRO	EC2	2	PASI-M
		EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237008	**DP-32 (9-10)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237009	**DP-33 (4-5)**	WI MOD DRO	EC2	2	PASI-M
		EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D2974	JDL	1	PASI-M
10419237010	**DP-33 (8.5-10)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237011	**DP-34 (2-3)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237012	**DP-34 (9-10)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237013	**DP-35 (2-3)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237014	**DP-35 (8.5-9.5)**	EPA 6010C	IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237015	**DP-36 (4-5)**	WI MOD DRO	EC2	2	PASI-M
		EPA 6010C	DM, IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237016	**DP-36 (9-10)**	EPA 6010C	DM, IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237017	**DP-37 (4-5)**	WI MOD DRO	EC2	2	PASI-M
		EPA 6010C	DM, IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10419237018	**DP-37 (8.5-10)**	EPA 6010C	DM, IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M

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SAMPLE ANALYTE COUNT

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	CS2	1	PASI-M
10419237019	**DP-38 (4-5)**	EPA 6010C	DM, IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	CS2	1	PASI-M
10419237020	**DP-38 (7-8.5)**	EPA 6010C	DM, IP	10	PASI-M
		EPA 6020A	WBS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	CS2	1	PASI-M

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-30 (2-3) **Lab ID: 10419237001** Collected: 02/01/18 09:10 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 14:08	7440-36-0	M1
Beryllium	**0.20J**	mg/kg	0.26	0.031	1	02/05/18 09:10	02/06/18 14:08	7440-41-7	
Cadmium	**0.056J**	mg/kg	0.16	0.016	1	02/05/18 09:10	02/06/18 14:08	7440-43-9	
Chromium	**6.7**	mg/kg	0.52	0.066	1	02/05/18 09:10	02/06/18 14:08	7440-47-3	
Copper	**7.2**	mg/kg	0.52	0.087	1	02/05/18 09:10	02/06/18 14:08	7440-50-8	
Lead	**5.8**	mg/kg	0.52	0.12	1	02/05/18 09:10	02/06/18 14:08	7439-92-1	
Nickel	**8.3**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 14:08	7440-02-0	
Silver	ND	mg/kg	0.52	0.041	1	02/05/18 09:10	02/06/18 14:08	7440-22-4	
Thallium	ND	mg/kg	1.0	0.23	1	02/05/18 09:10	02/06/18 14:08	7440-28-0	
Zinc	**19.1**	mg/kg	1.0	0.30	1	02/05/18 09:10	02/06/18 14:08	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.3**	mg/kg	0.53	0.24	20	02/05/18 09:26	02/05/18 20:38	7440-38-2	
Selenium	**0.28J**	mg/kg	0.53	0.27	20	02/05/18 09:26	02/05/18 20:38	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.022	0.010	1	02/05/18 09:33	02/07/18 16:49	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**9.6**	%	0.10	0.10	1		02/07/18 12:49		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-30 (9-10) **Lab ID: 10419237002** Collected: 02/01/18 09:20 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.33J**	mg/kg	1.1	0.12	1	02/05/18 09:10	02/06/18 14:28	7440-36-0	B
Beryllium	ND	mg/kg	0.26	0.032	1	02/05/18 09:10	02/06/18 14:28	7440-41-7	
Cadmium	**0.057J**	mg/kg	0.16	0.016	1	02/05/18 09:10	02/06/18 14:28	7440-43-9	
Chromium	**4.4**	mg/kg	0.53	0.067	1	02/05/18 09:10	02/06/18 14:28	7440-47-3	
Copper	**8.5**	mg/kg	0.53	0.089	1	02/05/18 09:10	02/06/18 14:28	7440-50-8	
Lead	**3.4**	mg/kg	0.53	0.12	1	02/05/18 09:10	02/06/18 14:28	7439-92-1	
Nickel	**3.7**	mg/kg	1.1	0.12	1	02/05/18 09:10	02/06/18 14:28	7440-02-0	
Silver	ND	mg/kg	0.53	0.041	1	02/05/18 09:10	02/06/18 14:28	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/05/18 09:10	02/06/18 14:28	7440-28-0	
Zinc	**4.6**	mg/kg	1.1	0.31	1	02/05/18 09:10	02/06/18 14:28	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.5**	mg/kg	0.52	0.23	20	02/05/18 09:26	02/05/18 20:51	7440-38-2	
Selenium	ND	mg/kg	0.52	0.26	20	02/05/18 09:26	02/05/18 20:51	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.020	0.0092	1	02/05/18 09:33	02/07/18 16:56	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**5.5**	%	0.10	0.10	1		02/07/18 13:48		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-29 (2-3) **Lab ID: 10419237003** Collected: 02/01/18 09:45 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 14:32	7440-36-0	
Beryllium	**0.24J**	mg/kg	0.26	0.031	1	02/05/18 09:10	02/06/18 14:32	7440-41-7	
Cadmium	**0.074J**	mg/kg	0.15	0.016	1	02/05/18 09:10	02/06/18 14:32	7440-43-9	
Chromium	**7.4**	mg/kg	0.51	0.066	1	02/05/18 09:10	02/06/18 14:32	7440-47-3	
Copper	**7.9**	mg/kg	0.51	0.086	1	02/05/18 09:10	02/06/18 14:32	7440-50-8	
Lead	**7.2**	mg/kg	0.51	0.12	1	02/05/18 09:10	02/06/18 14:32	7439-92-1	
Nickel	**9.6**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 14:32	7440-02-0	
Silver	ND	mg/kg	0.51	0.040	1	02/05/18 09:10	02/06/18 14:32	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/05/18 09:10	02/06/18 14:32	7440-28-0	
Zinc	**23.5**	mg/kg	1.0	0.30	1	02/05/18 09:10	02/06/18 14:32	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.7**	mg/kg	0.54	0.24	20	02/05/18 09:26	02/05/18 20:54	7440-38-2	
Selenium	**0.29J**	mg/kg	0.54	0.27	20	02/05/18 09:26	02/05/18 20:54	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.015J**	mg/kg	0.021	0.0097	1	02/05/18 09:33	02/07/18 16:58	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**10.1**	%	0.10	0.10	1		02/07/18 13:48		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-29 (8.5-10) **Lab ID: 10419237004** Collected: 02/01/18 10:00 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.37J**	mg/kg	1.5	0.17	1	02/05/18 09:10	02/06/18 14:36	7440-36-0	B
Beryllium	ND	mg/kg	0.37	0.044	1	02/05/18 09:10	02/06/18 14:36	7440-41-7	
Cadmium	**0.57**	mg/kg	0.22	0.022	1	02/05/18 09:10	02/06/18 14:36	7440-43-9	
Chromium	**3.8**	mg/kg	0.73	0.093	1	02/05/18 09:10	02/06/18 14:36	7440-47-3	
Copper	**9.3**	mg/kg	0.73	0.12	1	02/05/18 09:10	02/06/18 14:36	7440-50-8	
Lead	**2.2**	mg/kg	0.73	0.17	1	02/05/18 09:10	02/06/18 14:36	7439-92-1	
Nickel	**19.4**	mg/kg	1.5	0.17	1	02/05/18 09:10	02/06/18 14:36	7440-02-0	
Silver	ND	mg/kg	0.73	0.057	1	02/05/18 09:10	02/06/18 14:36	7440-22-4	
Thallium	ND	mg/kg	1.5	0.32	1	02/05/18 09:10	02/06/18 14:36	7440-28-0	
Zinc	**9.6**	mg/kg	1.5	0.43	1	02/05/18 09:10	02/06/18 14:36	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.8**	mg/kg	0.74	0.33	20	02/05/18 09:26	02/05/18 20:56	7440-38-2	
Selenium	**1.3**	mg/kg	0.74	0.37	20	02/05/18 09:26	02/05/18 20:56	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.028	0.013	1	02/05/18 09:33	02/07/18 17:00	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**35.6**	%	0.10	0.10	1		02/07/18 13:48		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-31 (4-5) **Lab ID: 10419237005** Collected: 02/01/18 10:20 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.98J**	mg/kg	1.4	0.16	1	02/05/18 09:10	02/06/18 14:48	7440-36-0	B
Beryllium	**2.6**	mg/kg	0.35	0.042	1	02/05/18 09:10	02/06/18 14:48	7440-41-7	
Cadmium	**1.7**	mg/kg	0.21	0.022	1	02/05/18 09:10	02/06/18 14:48	7440-43-9	
Chromium	**40.8**	mg/kg	0.71	0.090	1	02/05/18 09:10	02/06/18 14:48	7440-47-3	
Copper	**19.4**	mg/kg	0.71	0.12	1	02/05/18 09:10	02/06/18 14:48	7440-50-8	
Lead	**24.5**	mg/kg	0.71	0.16	1	02/05/18 09:10	02/06/18 14:48	7439-92-1	
Nickel	**18.4**	mg/kg	1.4	0.17	1	02/05/18 09:10	02/06/18 14:48	7440-02-0	
Silver	ND	mg/kg	0.71	0.055	1	02/05/18 09:10	02/06/18 14:48	7440-22-4	
Thallium	**2.6**	mg/kg	1.4	0.30	1	02/05/18 09:10	02/06/18 14:48	7440-28-0	
Zinc	**150**	mg/kg	1.4	0.41	1	02/05/18 09:10	02/06/18 14:48	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**23.8**	mg/kg	0.72	0.33	20	02/05/18 09:26	02/05/18 21:36	7440-38-2	
Selenium	**1.9**	mg/kg	0.72	0.36	20	02/05/18 09:26	02/05/18 21:36	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.047**	mg/kg	0.026	0.012	1	02/05/18 09:33	02/07/18 17:06	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**31.8**	%	0.10	0.10	1		02/07/18 13:49		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-31 (9-10) **Lab ID: 10419237006** Collected: 02/01/18 10:25 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.28J**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 14:52	7440-36-0	B
Beryllium	ND	mg/kg	0.26	0.031	1	02/05/18 09:10	02/06/18 14:52	7440-41-7	
Cadmium	**0.051J**	mg/kg	0.15	0.016	1	02/05/18 09:10	02/06/18 14:52	7440-43-9	
Chromium	**3.8**	mg/kg	0.51	0.065	1	02/05/18 09:10	02/06/18 14:52	7440-47-3	
Copper	**5.4**	mg/kg	0.51	0.086	1	02/05/18 09:10	02/06/18 14:52	7440-50-8	
Lead	**3.7**	mg/kg	0.51	0.12	1	02/05/18 09:10	02/06/18 14:52	7439-92-1	
Nickel	**1.4**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 14:52	7440-02-0	
Silver	ND	mg/kg	0.51	0.040	1	02/05/18 09:10	02/06/18 14:52	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/05/18 09:10	02/06/18 14:52	7440-28-0	
Zinc	**3.8**	mg/kg	1.0	0.30	1	02/05/18 09:10	02/06/18 14:52	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.4**	mg/kg	0.51	0.23	20	02/05/18 09:26	02/05/18 21:39	7440-38-2	
Selenium	**0.27J**	mg/kg	0.51	0.26	20	02/05/18 09:26	02/05/18 21:39	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.021	0.0098	1	02/05/18 09:33	02/07/18 17:08	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**8.2**	%	0.10	0.10	1		02/07/18 13:49		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-32 (4-5) **Lab ID: 10419237007** Collected: 02/01/18 10:35 Received: 02/02/18 13:45 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								
WDRO C10-C28	**801**	mg/kg	88.1	17.3	1	02/05/18 14:06	02/06/18 08:50		T6
Surrogates									
n-Triacontane (S)	119	%.	59-133		1	02/05/18 14:06	02/06/18 08:50	638-68-6	
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 14:56	7440-36-0	
Beryllium	**0.89**	mg/kg	0.28	0.034	1	02/05/18 09:10	02/06/18 14:56	7440-41-7	
Cadmium	**0.57**	mg/kg	0.17	0.017	1	02/05/18 09:10	02/06/18 14:56	7440-43-9	
Chromium	**16.9**	mg/kg	0.56	0.072	1	02/05/18 09:10	02/06/18 14:56	7440-47-3	
Copper	**16.2**	mg/kg	0.56	0.094	1	02/05/18 09:10	02/06/18 14:56	7440-50-8	
Lead	**43.0**	mg/kg	0.56	0.13	1	02/05/18 09:10	02/06/18 14:56	7439-92-1	
Nickel	**15.6**	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 14:56	7440-02-0	
Silver	ND	mg/kg	0.56	0.044	1	02/05/18 09:10	02/06/18 14:56	7440-22-4	
Thallium	ND	mg/kg	1.1	0.24	1	02/05/18 09:10	02/06/18 14:56	7440-28-0	
Zinc	**77.7**	mg/kg	1.1	0.33	1	02/05/18 09:10	02/06/18 14:56	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**6.6**	mg/kg	0.55	0.25	20	02/05/18 09:26	02/05/18 21:42	7440-38-2	
Selenium	**0.89**	mg/kg	0.55	0.27	20	02/05/18 09:26	02/05/18 21:42	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.010J**	mg/kg	0.020	0.0093	1	02/05/18 09:33	02/07/18 17:10	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**16.3**	%	0.10	0.10	1		02/07/18 13:49		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-32 (9-10) **Lab ID: 10419237008** Collected: 02/01/18 10:40 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.96J**	mg/kg	1.4	0.16	1	02/05/18 09:10	02/06/18 15:00	7440-36-0	B
Beryllium	**1.9**	mg/kg	0.35	0.042	1	02/05/18 09:10	02/06/18 15:00	7440-41-7	
Cadmium	**1.2**	mg/kg	0.21	0.022	1	02/05/18 09:10	02/06/18 15:00	7440-43-9	
Chromium	**33.4**	mg/kg	0.70	0.090	1	02/05/18 09:10	02/06/18 15:00	7440-47-3	
Copper	**16.4**	mg/kg	0.70	0.12	1	02/05/18 09:10	02/06/18 15:00	7440-50-8	
Lead	**16.7**	mg/kg	0.70	0.16	1	02/05/18 09:10	02/06/18 15:00	7439-92-1	
Nickel	**26.5**	mg/kg	1.4	0.16	1	02/05/18 09:10	02/06/18 15:00	7440-02-0	
Silver	ND	mg/kg	0.70	0.055	1	02/05/18 09:10	02/06/18 15:00	7440-22-4	
Thallium	**1.2J**	mg/kg	1.4	0.30	1	02/05/18 09:10	02/06/18 15:00	7440-28-0	
Zinc	**115**	mg/kg	1.4	0.41	1	02/05/18 09:10	02/06/18 15:00	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**12.4**	mg/kg	0.72	0.33	20	02/05/18 09:26	02/05/18 21:44	7440-38-2	
Selenium	**27.8**	mg/kg	0.72	0.36	20	02/05/18 09:26	02/05/18 21:44	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.047**	mg/kg	0.027	0.013	1	02/05/18 09:33	02/07/18 17:12	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**35.5**	%	0.10	0.10	1		02/07/18 13:49		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-33 (4-5) **Lab ID: 10419237009** Collected: 02/01/18 10:50 Received: 02/02/18 13:45 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								
WDRO C10-C28	**21.0**	mg/kg	13.9	2.7	1	02/05/18 14:06	02/06/18 08:43		T7
Surrogates									
n-Triacontane (S)	94	%.	59-133		1	02/05/18 14:06	02/06/18 08:43	638-68-6	
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.4	0.16	1	02/05/18 09:10	02/06/18 15:04	7440-36-0	
Beryllium	**2.1**	mg/kg	0.35	0.042	1	02/05/18 09:10	02/06/18 15:04	7440-41-7	
Cadmium	**1.1**	mg/kg	0.21	0.021	1	02/05/18 09:10	02/06/18 15:04	7440-43-9	
Chromium	**30.4**	mg/kg	0.70	0.089	1	02/05/18 09:10	02/06/18 15:04	7440-47-3	
Copper	**16.7**	mg/kg	0.70	0.12	1	02/05/18 09:10	02/06/18 15:04	7440-50-8	
Lead	**24.7**	mg/kg	0.70	0.16	1	02/05/18 09:10	02/06/18 15:04	7439-92-1	
Nickel	**17.0**	mg/kg	1.4	0.16	1	02/05/18 09:10	02/06/18 15:04	7440-02-0	
Silver	ND	mg/kg	0.70	0.055	1	02/05/18 09:10	02/06/18 15:04	7440-22-4	
Thallium	**0.99J**	mg/kg	1.4	0.30	1	02/05/18 09:10	02/06/18 15:04	7440-28-0	
Zinc	**114**	mg/kg	1.4	0.41	1	02/05/18 09:10	02/06/18 15:04	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**17.6**	mg/kg	0.71	0.32	20	02/05/18 09:26	02/05/18 21:47	7440-38-2	
Selenium	**2.3**	mg/kg	0.71	0.36	20	02/05/18 09:26	02/05/18 21:47	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.049**	mg/kg	0.030	0.014	1	02/05/18 09:33	02/07/18 17:14	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**34.4**	%	0.10	0.10	1		02/07/18 13:49		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-33 (8.5-10) **Lab ID: 10419237010** Collected: 02/01/18 11:00 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.51J**	mg/kg	1.7	0.19	1	02/05/18 09:10	02/06/18 15:07	7440-36-0	B
Beryllium	**0.55**	mg/kg	0.42	0.050	1	02/05/18 09:10	02/06/18 15:07	7440-41-7	
Cadmium	**0.41**	mg/kg	0.25	0.025	1	02/05/18 09:10	02/06/18 15:07	7440-43-9	
Chromium	**7.8**	mg/kg	0.83	0.11	1	02/05/18 09:10	02/06/18 15:07	7440-47-3	
Copper	**24.5**	mg/kg	0.83	0.14	1	02/05/18 09:10	02/06/18 15:07	7440-50-8	
Lead	**7.1**	mg/kg	0.83	0.19	1	02/05/18 09:10	02/06/18 15:07	7439-92-1	
Nickel	**15.6**	mg/kg	1.7	0.19	1	02/05/18 09:10	02/06/18 15:07	7440-02-0	
Silver	ND	mg/kg	0.83	0.065	1	02/05/18 09:10	02/06/18 15:07	7440-22-4	
Thallium	ND	mg/kg	1.7	0.36	1	02/05/18 09:10	02/06/18 15:07	7440-28-0	
Zinc	**15.6**	mg/kg	1.7	0.48	1	02/05/18 09:10	02/06/18 15:07	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.4**	mg/kg	0.77	0.35	20	02/05/18 09:26	02/05/18 21:50	7440-38-2	
Selenium	**1.6**	mg/kg	0.77	0.39	20	02/05/18 09:26	02/05/18 21:50	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.022J**	mg/kg	0.029	0.013	1	02/05/18 09:33	02/07/18 17:16	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**40.5**	%	0.10	0.10	1		02/07/18 13:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-34 (2-3) **Lab ID: 10419237011** Collected: 02/01/18 13:05 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:11	7440-36-0	
Beryllium	**0.15J**	mg/kg	0.26	0.031	1	02/05/18 09:10	02/06/18 15:11	7440-41-7	
Cadmium	**0.076J**	mg/kg	0.15	0.016	1	02/05/18 09:10	02/06/18 15:11	7440-43-9	
Chromium	**6.1**	mg/kg	0.51	0.066	1	02/05/18 09:10	02/06/18 15:11	7440-47-3	
Copper	**6.4**	mg/kg	0.51	0.086	1	02/05/18 09:10	02/06/18 15:11	7440-50-8	
Lead	**11.2**	mg/kg	0.51	0.12	1	02/05/18 09:10	02/06/18 15:11	7439-92-1	
Nickel	**8.7**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:11	7440-02-0	
Silver	ND	mg/kg	0.51	0.040	1	02/05/18 09:10	02/06/18 15:11	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/05/18 09:10	02/06/18 15:11	7440-28-0	
Zinc	**18.1**	mg/kg	1.0	0.30	1	02/05/18 09:10	02/06/18 15:11	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.2**	mg/kg	0.51	0.23	20	02/05/18 09:26	02/05/18 21:52	7440-38-2	
Selenium	ND	mg/kg	0.51	0.25	20	02/05/18 09:26	02/05/18 21:52	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.018	0.0085	1	02/05/18 09:33	02/07/18 17:18	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**5.6**	%	0.10	0.10	1		02/07/18 13:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-34 (9-10) **Lab ID: 10419237012** Collected: 02/01/18 13:10 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.3	0.15	1	02/05/18 09:10	02/06/18 15:15	7440-36-0	
Beryllium	**0.39**	mg/kg	0.32	0.038	1	02/05/18 09:10	02/06/18 15:15	7440-41-7	
Cadmium	**0.15J**	mg/kg	0.19	0.020	1	02/05/18 09:10	02/06/18 15:15	7440-43-9	
Chromium	**9.8**	mg/kg	0.64	0.081	1	02/05/18 09:10	02/06/18 15:15	7440-47-3	
Copper	**14.6**	mg/kg	0.64	0.11	1	02/05/18 09:10	02/06/18 15:15	7440-50-8	
Lead	**6.7**	mg/kg	0.64	0.14	1	02/05/18 09:10	02/06/18 15:15	7439-92-1	
Nickel	**29.8**	mg/kg	1.3	0.15	1	02/05/18 09:10	02/06/18 15:15	7440-02-0	
Silver	ND	mg/kg	0.64	0.050	1	02/05/18 09:10	02/06/18 15:15	7440-22-4	
Thallium	ND	mg/kg	1.3	0.28	1	02/05/18 09:10	02/06/18 15:15	7440-28-0	
Zinc	**28.6**	mg/kg	1.3	0.37	1	02/05/18 09:10	02/06/18 15:15	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.2**	mg/kg	0.64	0.29	20	02/05/18 09:26	02/05/18 21:55	7440-38-2	
Selenium	ND	mg/kg	0.64	0.32	20	02/05/18 09:26	02/05/18 21:55	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.025**	mg/kg	0.025	0.012	1	02/05/18 09:33	02/07/18 17:20	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**24.1**	%	0.10	0.10	1		02/07/18 13:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-35 (2-3) **Lab ID: 10419237013** Collected: 02/01/18 13:30 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:19	7440-36-0	
Beryllium	**0.14J**	mg/kg	0.25	0.031	1	02/05/18 09:10	02/06/18 15:19	7440-41-7	
Cadmium	**0.10J**	mg/kg	0.15	0.016	1	02/05/18 09:10	02/06/18 15:19	7440-43-9	
Chromium	**5.9**	mg/kg	0.51	0.065	1	02/05/18 09:10	02/06/18 15:19	7440-47-3	
Copper	**6.1**	mg/kg	0.51	0.085	1	02/05/18 09:10	02/06/18 15:19	7440-50-8	
Lead	**4.1**	mg/kg	0.51	0.12	1	02/05/18 09:10	02/06/18 15:19	7439-92-1	
Nickel	**9.7**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:19	7440-02-0	
Silver	ND	mg/kg	0.51	0.040	1	02/05/18 09:10	02/06/18 15:19	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/05/18 09:10	02/06/18 15:19	7440-28-0	
Zinc	**15.8**	mg/kg	1.0	0.30	1	02/05/18 09:10	02/06/18 15:19	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**3.4**	mg/kg	0.53	0.24	20	02/05/18 09:26	02/05/18 21:58	7440-38-2	
Selenium	ND	mg/kg	0.53	0.27	20	02/05/18 09:26	02/05/18 21:58	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.021	0.0096	1	02/05/18 09:33	02/07/18 17:27	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**6.5**	%	0.10	0.10	1		02/07/18 13:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-35 (8.5-9.5) **Lab ID: 10419237014** Collected: 02/01/18 13:40 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.13J**	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 15:23	7440-36-0	B
Beryllium	**0.24J**	mg/kg	0.27	0.033	1	02/05/18 09:10	02/06/18 15:23	7440-41-7	
Cadmium	**0.15J**	mg/kg	0.16	0.017	1	02/05/18 09:10	02/06/18 15:23	7440-43-9	
Chromium	**8.3**	mg/kg	0.55	0.069	1	02/05/18 09:10	02/06/18 15:23	7440-47-3	
Copper	**9.8**	mg/kg	0.55	0.091	1	02/05/18 09:10	02/06/18 15:23	7440-50-8	
Lead	**8.8**	mg/kg	0.55	0.12	1	02/05/18 09:10	02/06/18 15:23	7439-92-1	
Nickel	**11.7**	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 15:23	7440-02-0	
Silver	ND	mg/kg	0.55	0.043	1	02/05/18 09:10	02/06/18 15:23	7440-22-4	
Thallium	ND	mg/kg	1.1	0.24	1	02/05/18 09:10	02/06/18 15:23	7440-28-0	
Zinc	**28.5**	mg/kg	1.1	0.32	1	02/05/18 09:10	02/06/18 15:23	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.4**	mg/kg	0.55	0.25	20	02/05/18 09:26	02/05/18 22:00	7440-38-2	
Selenium	ND	mg/kg	0.55	0.28	20	02/05/18 09:26	02/05/18 22:00	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.013J**	mg/kg	0.020	0.0093	1	02/05/18 09:33	02/07/18 17:29	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**11.8**	%	0.10	0.10	1		02/07/18 13:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-36 (4-5) **Lab ID: 10419237015** Collected: 02/01/18 13:55 Received: 02/02/18 13:45 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								
WDRO C10-C28	**21.1**	mg/kg	8.0	1.6	1	02/05/18 14:06	02/06/18 08:36		
Surrogates									
n-Triacontane (S)	98	%.	59-133		1	02/05/18 14:06	02/06/18 08:36	638-68-6	
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.12	1	02/05/18 09:10	02/06/18 15:35	7440-36-0	
Beryllium	**0.13J**	mg/kg	0.26	0.032	1	02/05/18 09:10	02/06/18 15:35	7440-41-7	
Cadmium	**0.042J**	mg/kg	0.16	0.016	1	02/05/18 09:10	02/06/18 15:35	7440-43-9	
Chromium	**4.6**	mg/kg	0.53	0.067	1	02/05/18 09:10	02/06/18 15:35	7440-47-3	
Copper	**4.5**	mg/kg	0.53	0.088	1	02/05/18 09:10	02/06/18 15:35	7440-50-8	
Lead	**3.6**	mg/kg	0.53	0.12	1	02/05/18 09:10	02/07/18 14:13	7439-92-1	
Nickel	**7.8**	mg/kg	1.1	0.12	1	02/05/18 09:10	02/06/18 15:35	7440-02-0	
Silver	ND	mg/kg	0.53	0.041	1	02/05/18 09:10	02/06/18 15:35	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/05/18 09:10	02/06/18 15:35	7440-28-0	
Zinc	**13.6**	mg/kg	1.1	0.31	1	02/05/18 09:10	02/06/18 15:35	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.9**	mg/kg	0.52	0.24	20	02/05/18 09:26	02/05/18 22:14	7440-38-2	
Selenium	ND	mg/kg	0.52	0.26	20	02/05/18 09:26	02/05/18 22:14	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.022	0.010	1	02/05/18 09:33	02/07/18 17:31	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**9.8**	%	0.10	0.10	1		02/07/18 13:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-36 (9-10) **Lab ID: 10419237016** Collected: 02/01/18 14:05 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:39	7440-36-0	
Beryllium	**0.18J**	mg/kg	0.26	0.031	1	02/05/18 09:10	02/06/18 15:39	7440-41-7	
Cadmium	**0.070J**	mg/kg	0.16	0.016	1	02/05/18 09:10	02/06/18 15:39	7440-43-9	
Chromium	**7.2**	mg/kg	0.52	0.066	1	02/05/18 09:10	02/06/18 15:39	7440-47-3	
Copper	**7.4**	mg/kg	0.52	0.087	1	02/05/18 09:10	02/06/18 15:39	7440-50-8	
Lead	**5.0**	mg/kg	0.52	0.12	1	02/05/18 09:10	02/07/18 14:15	7439-92-1	
Nickel	**8.1**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:39	7440-02-0	
Silver	ND	mg/kg	0.52	0.041	1	02/05/18 09:10	02/06/18 15:39	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/05/18 09:10	02/06/18 15:39	7440-28-0	
Zinc	**18.5**	mg/kg	1.0	0.30	1	02/05/18 09:10	02/06/18 15:39	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.2**	mg/kg	0.53	0.24	20	02/05/18 09:26	02/05/18 22:17	7440-38-2	
Selenium	ND	mg/kg	0.53	0.27	20	02/05/18 09:26	02/05/18 22:17	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.019	0.0086	1	02/05/18 09:33	02/07/18 17:33	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**7.7**	%	0.10	0.10	1		02/07/18 13:51		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-37 (4-5) **Lab ID: 10419237017** Collected: 02/01/18 14:20 Received: 02/02/18 13:45 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								
WDRO C10-C28	**49.8**	mg/kg	39.5	7.7	5	02/05/18 14:06	02/06/18 08:29		T6
Surrogates									
n-Triacontane (S)	89	%.	59-133		5	02/05/18 14:06	02/06/18 08:29	638-68-6	
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.14J**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:43	7440-36-0	B
Beryllium	**0.074J**	mg/kg	0.26	0.031	1	02/05/18 09:10	02/06/18 15:43	7440-41-7	
Cadmium	**0.089J**	mg/kg	0.15	0.016	1	02/05/18 09:10	02/06/18 15:43	7440-43-9	
Chromium	**5.7**	mg/kg	0.51	0.065	1	02/05/18 09:10	02/06/18 15:43	7440-47-3	
Copper	**5.4**	mg/kg	0.51	0.086	1	02/05/18 09:10	02/06/18 15:43	7440-50-8	
Lead	**3.1**	mg/kg	0.51	0.12	1	02/05/18 09:10	02/07/18 14:18	7439-92-1	
Nickel	**7.8**	mg/kg	1.0	0.12	1	02/05/18 09:10	02/06/18 15:43	7440-02-0	
Silver	ND	mg/kg	0.51	0.040	1	02/05/18 09:10	02/06/18 15:43	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/05/18 09:10	02/06/18 15:43	7440-28-0	
Zinc	**13.9**	mg/kg	1.0	0.30	1	02/05/18 09:10	02/06/18 15:43	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.9**	mg/kg	0.54	0.25	20	02/05/18 09:26	02/05/18 22:19	7440-38-2	
Selenium	**0.29J**	mg/kg	0.54	0.27	20	02/05/18 09:26	02/05/18 22:19	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.022	0.010	1	02/05/18 09:33	02/07/18 17:35	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**8.0**	%	0.10	0.10	1		02/07/18 13:51		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-37 (8.5-10) **Lab ID: 10419237018** Collected: 02/01/18 14:40 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 15:47	7440-36-0	B
Beryllium	**0.30**	mg/kg	0.27	0.033	1	02/05/18 09:10	02/06/18 15:47	7440-41-7	
Cadmium	**0.14J**	mg/kg	0.16	0.017	1	02/05/18 09:10	02/06/18 15:47	7440-43-9	
Chromium	**7.3**	mg/kg	0.54	0.069	1	02/05/18 09:10	02/06/18 15:47	7440-47-3	
Copper	**8.0**	mg/kg	0.54	0.091	1	02/05/18 09:10	02/06/18 15:47	7440-50-8	
Lead	**65.9**	mg/kg	0.54	0.12	1	02/05/18 09:10	02/07/18 14:21	7439-92-1	
Nickel	**8.6**	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 15:47	7440-02-0	
Silver	ND	mg/kg	0.54	0.042	1	02/05/18 09:10	02/06/18 15:47	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/05/18 09:10	02/06/18 15:47	7440-28-0	
Zinc	**30.9**	mg/kg	1.1	0.32	1	02/05/18 09:10	02/06/18 15:47	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.3**	mg/kg	0.53	0.24	20	02/05/18 09:26	02/05/18 22:22	7440-38-2	
Selenium	ND	mg/kg	0.53	0.26	20	02/05/18 09:26	02/05/18 22:22	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.019	0.0089	1	02/05/18 09:33	02/07/18 17:37	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**10.5**	%	0.10	0.10	1		02/07/18 14:41		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-38 (4-5) **Lab ID: 10419237019** Collected: 02/01/18 15:00 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.3	0.15	1	02/05/18 09:10	02/06/18 15:51	7440-36-0	
Beryllium	**0.20J**	mg/kg	0.32	0.038	1	02/05/18 09:10	02/06/18 15:51	7440-41-7	
Cadmium	**0.098J**	mg/kg	0.19	0.020	1	02/05/18 09:10	02/06/18 15:51	7440-43-9	
Chromium	**6.8**	mg/kg	0.64	0.081	1	02/05/18 09:10	02/06/18 15:51	7440-47-3	
Copper	**7.2**	mg/kg	0.64	0.11	1	02/05/18 09:10	02/06/18 15:51	7440-50-8	
Lead	**5.6**	mg/kg	0.64	0.14	1	02/05/18 09:10	02/07/18 14:24	7439-92-1	
Nickel	**11.0**	mg/kg	1.3	0.15	1	02/05/18 09:10	02/06/18 15:51	7440-02-0	
Silver	ND	mg/kg	0.64	0.050	1	02/05/18 09:10	02/06/18 15:51	7440-22-4	
Thallium	ND	mg/kg	1.3	0.28	1	02/05/18 09:10	02/06/18 15:51	7440-28-0	
Zinc	**16.8**	mg/kg	1.3	0.37	1	02/05/18 09:10	02/06/18 15:51	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**3.9**	mg/kg	0.65	0.29	20	02/05/18 09:26	02/05/18 22:25	7440-38-2	
Selenium	**0.38J**	mg/kg	0.65	0.33	20	02/05/18 09:26	02/05/18 22:25	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.024	0.011	1	02/05/18 09:33	02/07/18 17:39	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**24.8**	%	0.10	0.10	1		02/07/18 14:43		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Sample: DP-38 (7-8.5) **Lab ID: 10419237020** Collected: 02/01/18 15:10 Received: 02/02/18 13:45 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 15:55	7440-36-0	
Beryllium	**0.20J**	mg/kg	0.28	0.034	1	02/05/18 09:10	02/06/18 15:55	7440-41-7	
Cadmium	**0.096J**	mg/kg	0.17	0.017	1	02/05/18 09:10	02/06/18 15:55	7440-43-9	
Chromium	**8.8**	mg/kg	0.57	0.073	1	02/05/18 09:10	02/06/18 15:55	7440-47-3	
Copper	**11.8**	mg/kg	0.57	0.095	1	02/05/18 09:10	02/06/18 15:55	7440-50-8	
Lead	**3.1**	mg/kg	0.57	0.13	1	02/05/18 09:10	02/07/18 14:27	7439-92-1	
Nickel	**9.2**	mg/kg	1.1	0.13	1	02/05/18 09:10	02/06/18 15:55	7440-02-0	
Silver	ND	mg/kg	0.57	0.044	1	02/05/18 09:10	02/06/18 15:55	7440-22-4	
Thallium	ND	mg/kg	1.1	0.25	1	02/05/18 09:10	02/06/18 15:55	7440-28-0	
Zinc	**21.5**	mg/kg	1.1	0.33	1	02/05/18 09:10	02/06/18 15:55	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.2**	mg/kg	0.56	0.25	20	02/05/18 09:26	02/05/18 22:27	7440-38-2	
Selenium	ND	mg/kg	0.56	0.28	20	02/05/18 09:26	02/05/18 22:27	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.022	0.010	1	02/05/18 09:33	02/07/18 17:41	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**12.2**	%	0.10	0.10	1		02/07/18 14:44		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

QC Batch: 521206 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids
Associated Lab Samples: 10419237001, 10419237002, 10419237003, 10419237004, 10419237005, 10419237006, 10419237007, 10419237008, 10419237009, 10419237010, 10419237011, 10419237012, 10419237013, 10419237014, 10419237015, 10419237016, 10419237017, 10419237018, 10419237019, 10419237020

METHOD BLANK: 2830276 Matrix: Solid
Associated Lab Samples: 10419237001, 10419237002, 10419237003, 10419237004, 10419237005, 10419237006, 10419237007, 10419237008, 10419237009, 10419237010, 10419237011, 10419237012, 10419237013, 10419237014, 10419237015, 10419237016, 10419237017, 10419237018, 10419237019, 10419237020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.019	0.0087	02/07/18 16:45	

LABORATORY CONTROL SAMPLE: 2830277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.42	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2830278 2830279

Parameter	Units	10419237001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	.48	.46	0.43	0.43	89	91	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

QC Batch: 521201 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10419237001, 10419237002, 10419237003, 10419237004, 10419237005, 10419237006, 10419237007, 10419237008, 10419237009, 10419237010, 10419237011, 10419237012, 10419237013, 10419237014, 10419237015, 10419237016, 10419237017, 10419237018, 10419237019, 10419237020

METHOD BLANK: 2830256 Matrix: Solid
Associated Lab Samples: 10419237001, 10419237002, 10419237003, 10419237004, 10419237005, 10419237006, 10419237007, 10419237008, 10419237009, 10419237010, 10419237011, 10419237012, 10419237013, 10419237014, 10419237015, 10419237016, 10419237017, 10419237018, 10419237019, 10419237020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	mg/kg	0.12J	0.96	0.11	02/06/18 14:00	
Beryllium	mg/kg	ND	0.24	0.029	02/06/18 14:00	
Cadmium	mg/kg	ND	0.14	0.015	02/06/18 14:00	
Chromium	mg/kg	ND	0.48	0.061	02/06/18 14:00	
Copper	mg/kg	ND	0.48	0.080	02/06/18 14:00	
Lead	mg/kg	ND	0.48	0.11	02/06/18 14:00	
Nickel	mg/kg	ND	0.96	0.11	02/06/18 14:00	
Silver	mg/kg	ND	0.48	0.038	02/06/18 14:00	
Thallium	mg/kg	ND	0.96	0.21	02/06/18 14:00	
Zinc	mg/kg	ND	0.96	0.28	02/06/18 14:00	

LABORATORY CONTROL SAMPLE: 2830257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	49.1	103	80-120	
Beryllium	mg/kg	47.6	44.6	94	80-120	
Cadmium	mg/kg	47.6	47.5	100	80-120	
Chromium	mg/kg	47.6	47.6	100	80-120	
Copper	mg/kg	47.6	47.2	99	80-120	
Lead	mg/kg	47.6	50.4	106	80-120	
Nickel	mg/kg	47.6	48.0	101	80-120	
Silver	mg/kg	23.8	23.2	97	80-120	
Thallium	mg/kg	47.6	49.0	103	80-120	
Zinc	mg/kg	47.6	51.0	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2830258 2830259

Parameter	Units	10419237001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	ND	50.7	50.3	32.7	30.9	65	61	75-125	6	20	M1
Beryllium	mg/kg	0.20J	50.7	50.3	46.0	45.4	90	90	75-125	1	20	
Cadmium	mg/kg	0.056J	50.7	50.3	47.3	47.1	93	94	75-125	1	20	
Chromium	mg/kg	6.7	50.7	50.3	53.5	53.5	92	93	75-125	0	20	
Copper	mg/kg	7.2	50.7	50.3	54.0	55.4	92	96	75-125	3	20	
Lead	mg/kg	5.8	50.7	50.3	52.6	53.0	92	94	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2830258 2830259

Parameter	Units	10419237001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nickel	mg/kg	8.3	50.7	50.3	53.9	55.5	90	94	75-125	3	20	
Silver	mg/kg	ND	25.3	25.1	23.6	23.4	93	93	75-125	1	20	
Thallium	mg/kg	ND	50.7	50.3	42.8	42.9	84	85	75-125	0	20	
Zinc	mg/kg	19.1	50.7	50.3	70.6	70.1	102	102	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

QC Batch: 521204 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10419237001, 10419237002, 10419237003, 10419237004, 10419237005, 10419237006, 10419237007, 10419237008, 10419237009, 10419237010, 10419237011, 10419237012, 10419237013, 10419237014, 10419237015, 10419237016, 10419237017, 10419237018, 10419237019, 10419237020

METHOD BLANK: 2830268 Matrix: Solid
Associated Lab Samples: 10419237001, 10419237002, 10419237003, 10419237004, 10419237005, 10419237006, 10419237007, 10419237008, 10419237009, 10419237010, 10419237011, 10419237012, 10419237013, 10419237014, 10419237015, 10419237016, 10419237017, 10419237018, 10419237019, 10419237020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.50	0.23	02/05/18 20:33	
Selenium	mg/kg	ND	0.50	0.25	02/05/18 20:33	

LABORATORY CONTROL SAMPLE: 2830269

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	49	44.1	90	80-120	
Selenium	mg/kg	49	44.1	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2830270 2830271

Parameter	Units	10419237001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	2.3	50.3	53.6	48.3	51.1	92	91	75-125	6	20	
Selenium	mg/kg	0.28J	50.3	53.6	44.0	45.6	87	84	75-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

QC Batch: 521693
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10419237001

SAMPLE DUPLICATE: 2832310

Parameter	Units	10419410004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.0	12.7	9	30	

SAMPLE DUPLICATE: 2832417

Parameter	Units	10419128012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.2	16.0	1	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

QC Batch: 521700 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10419237002, 10419237003, 10419237004, 10419237005, 10419237006, 10419237007, 10419237008, 10419237009, 10419237010, 10419237011, 10419237012, 10419237013, 10419237014, 10419237015, 10419237016, 10419237017

SAMPLE DUPLICATE: 2832341

Parameter	Units	10419410008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.4	17.9	3	30	

SAMPLE DUPLICATE: 2832421

Parameter	Units	10419237004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	35.6	37.9	6	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

QC Batch: 521751 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10419237018, 10419237019, 10419237020

SAMPLE DUPLICATE: 2832446

Parameter	Units	10419237018 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.5	10.7	3	30	

SAMPLE DUPLICATE: 2832447

Parameter	Units	10419316006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	25.7	27.2	6	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

QC Batch: 521364 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO Solid GCV
Associated Lab Samples: 10419237007, 10419237009, 10419237015, 10419237017

METHOD BLANK: 2830821 Matrix: Solid
Associated Lab Samples: 10419237007, 10419237009, 10419237015, 10419237017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	2.0	02/06/18 08:08	
n-Triacontane (S)	%.	85	59-133		02/06/18 08:08	

LABORATORY CONTROL SAMPLE & LCSD: 2830822 2830823

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	70.2	73.2	88	92	54-125	4	20	
n-Triacontane (S)	%.				88	91	59-133			

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

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.

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.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
T6	High boiling point hydrocarbons are present in the sample.
T7	Low boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10419237007	**DP-32 (4-5)**	WI MOD DRO	521364	WI MOD DRO	521453
10419237009	**DP-33 (4-5)**	WI MOD DRO	521364	WI MOD DRO	521453
10419237015	**DP-36 (4-5)**	WI MOD DRO	521364	WI MOD DRO	521453
10419237017	**DP-37 (4-5)**	WI MOD DRO	521364	WI MOD DRO	521453
10419237001	**DP-30 (2-3)**	EPA 3050	521201	EPA 6010C	521439
10419237002	**DP-30 (9-10)**	EPA 3050	521201	EPA 6010C	521439
10419237003	**DP-29 (2-3)**	EPA 3050	521201	EPA 6010C	521439
10419237004	**DP-29 (8.5-10)**	EPA 3050	521201	EPA 6010C	521439
10419237005	**DP-31 (4-5)**	EPA 3050	521201	EPA 6010C	521439
10419237006	**DP-31 (9-10)**	EPA 3050	521201	EPA 6010C	521439
10419237007	**DP-32 (4-5)**	EPA 3050	521201	EPA 6010C	521439
10419237008	**DP-32 (9-10)**	EPA 3050	521201	EPA 6010C	521439
10419237009	**DP-33 (4-5)**	EPA 3050	521201	EPA 6010C	521439
10419237010	**DP-33 (8.5-10)**	EPA 3050	521201	EPA 6010C	521439
10419237011	**DP-34 (2-3)**	EPA 3050	521201	EPA 6010C	521439
10419237012	**DP-34 (9-10)**	EPA 3050	521201	EPA 6010C	521439
10419237013	**DP-35 (2-3)**	EPA 3050	521201	EPA 6010C	521439
10419237014	**DP-35 (8.5-9.5)**	EPA 3050	521201	EPA 6010C	521439
10419237015	**DP-36 (4-5)**	EPA 3050	521201	EPA 6010C	521439
10419237016	**DP-36 (9-10)**	EPA 3050	521201	EPA 6010C	521439
10419237017	**DP-37 (4-5)**	EPA 3050	521201	EPA 6010C	521439
10419237018	**DP-37 (8.5-10)**	EPA 3050	521201	EPA 6010C	521439
10419237019	**DP-38 (4-5)**	EPA 3050	521201	EPA 6010C	521439
10419237020	**DP-38 (7-8.5)**	EPA 3050	521201	EPA 6010C	521439
10419237001	**DP-30 (2-3)**	EPA 3050	521204	EPA 6020A	521378
10419237002	**DP-30 (9-10)**	EPA 3050	521204	EPA 6020A	521378
10419237003	**DP-29 (2-3)**	EPA 3050	521204	EPA 6020A	521378
10419237004	**DP-29 (8.5-10)**	EPA 3050	521204	EPA 6020A	521378
10419237005	**DP-31 (4-5)**	EPA 3050	521204	EPA 6020A	521378
10419237006	**DP-31 (9-10)**	EPA 3050	521204	EPA 6020A	521378
10419237007	**DP-32 (4-5)**	EPA 3050	521204	EPA 6020A	521378
10419237008	**DP-32 (9-10)**	EPA 3050	521204	EPA 6020A	521378
10419237009	**DP-33 (4-5)**	EPA 3050	521204	EPA 6020A	521378
10419237010	**DP-33 (8.5-10)**	EPA 3050	521204	EPA 6020A	521378
10419237011	**DP-34 (2-3)**	EPA 3050	521204	EPA 6020A	521378
10419237012	**DP-34 (9-10)**	EPA 3050	521204	EPA 6020A	521378
10419237013	**DP-35 (2-3)**	EPA 3050	521204	EPA 6020A	521378
10419237014	**DP-35 (8.5-9.5)**	EPA 3050	521204	EPA 6020A	521378
10419237015	**DP-36 (4-5)**	EPA 3050	521204	EPA 6020A	521378
10419237016	**DP-36 (9-10)**	EPA 3050	521204	EPA 6020A	521378
10419237017	**DP-37 (4-5)**	EPA 3050	521204	EPA 6020A	521378
10419237018	**DP-37 (8.5-10)**	EPA 3050	521204	EPA 6020A	521378
10419237019	**DP-38 (4-5)**	EPA 3050	521204	EPA 6020A	521378
10419237020	**DP-38 (7-8.5)**	EPA 3050	521204	EPA 6020A	521378
10419237001	**DP-30 (2-3)**	EPA 7471B	521206	EPA 7471B	521351
10419237002	**DP-30 (9-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237003	**DP-29 (2-3)**	EPA 7471B	521206	EPA 7471B	521351

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31401059.001 I-35W MN Rvr Brid
Pace Project No.: 10419237

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10419237004	**DP-29 (8.5-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237005	**DP-31 (4-5)**	EPA 7471B	521206	EPA 7471B	521351
10419237006	**DP-31 (9-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237007	**DP-32 (4-5)**	EPA 7471B	521206	EPA 7471B	521351
10419237008	**DP-32 (9-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237009	**DP-33 (4-5)**	EPA 7471B	521206	EPA 7471B	521351
10419237010	**DP-33 (8.5-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237011	**DP-34 (2-3)**	EPA 7471B	521206	EPA 7471B	521351
10419237012	**DP-34 (9-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237013	**DP-35 (2-3)**	EPA 7471B	521206	EPA 7471B	521351
10419237014	**DP-35 (8.5-9.5)**	EPA 7471B	521206	EPA 7471B	521351
10419237015	**DP-36 (4-5)**	EPA 7471B	521206	EPA 7471B	521351
10419237016	**DP-36 (9-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237017	**DP-37 (4-5)**	EPA 7471B	521206	EPA 7471B	521351
10419237018	**DP-37 (8.5-10)**	EPA 7471B	521206	EPA 7471B	521351
10419237019	**DP-38 (4-5)**	EPA 7471B	521206	EPA 7471B	521351
10419237020	**DP-38 (7-8.5)**	EPA 7471B	521206	EPA 7471B	521351
10419237001	**DP-30 (2-3)**	ASTM D2974	521693		
10419237002	**DP-30 (9-10)**	ASTM D2974	521700		
10419237003	**DP-29 (2-3)**	ASTM D2974	521700		
10419237004	**DP-29 (8.5-10)**	ASTM D2974	521700		
10419237005	**DP-31 (4-5)**	ASTM D2974	521700		
10419237006	**DP-31 (9-10)**	ASTM D2974	521700		
10419237007	**DP-32 (4-5)**	ASTM D2974	521700		
10419237008	**DP-32 (9-10)**	ASTM D2974	521700		
10419237009	**DP-33 (4-5)**	ASTM D2974	521700		
10419237010	**DP-33 (8.5-10)**	ASTM D2974	521700		
10419237011	**DP-34 (2-3)**	ASTM D2974	521700		
10419237012	**DP-34 (9-10)**	ASTM D2974	521700		
10419237013	**DP-35 (2-3)**	ASTM D2974	521700		
10419237014	**DP-35 (8.5-9.5)**	ASTM D2974	521700		
10419237015	**DP-36 (4-5)**	ASTM D2974	521700		
10419237016	**DP-36 (9-10)**	ASTM D2974	521700		
10419237017	**DP-37 (4-5)**	ASTM D2974	521700		
10419237018	**DP-37 (8.5-10)**	ASTM D2974	521751		
10419237019	**DP-38 (4-5)**	ASTM D2974	521751		
10419237020	**DP-38 (7-8.5)**	ASTM D2974	521751		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

10419237

Page: 1 of 2

2258735

Section A Required Client Information:

Company: WSP
Address: 123 North 3rd St. Ste. 509
Minneapolis, MN 55401
Email To: Paula Berger
Phone: 612-343-0570 Fax:
Requested Due Date/TAT: MnDOT 5-day

Section B Required Project Information:

Report To: Paula Berger
Copy To: Kevin Walter
Purchase Order No.:
Project Name: I-35W MN River Bridge
Project Number: 31401059.001

Section C Invoice Information:

Attention: Accounts Payable
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Bob Michels
Pace Profile #: 27017

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: Priority Pollutant metals	DRO (Silica gel cleanup)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	DP-30 (2-3)	SL	G			2-1	0910		1	X								X			001
2	DP-30 (9-10)						0920		1	X								X			002
3	DP-29 (2-3)						0945		1	X								X			003
4	DP-29 (8.5-10)						1000		1	X								X			004
5	DP-31 (4-5)						1020		1	X								X			005
6	DP-31 (9-10)						1025		1	X								X			006
7	DP-32 (4-5)						1035		2	X								X	X		007
8	DP-32 (9-10)						1040		1	X								X			008
9	DP-33 (4-5)						1050		3	X								X	X		009
10	DP-33 (8.5-10)						1100		1	X								X			010
11	DP-34 (2-3)						1305		1	X								X			011
12	DP-34 (9-10)						1310		1	X								X			012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Run DRO with silica gel cleanup	WSP	2-2-18	1345	PACE	2-2-18	1345	0.8	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Kevin Walter
SIGNATURE of SAMPLER:
DATE Signed (MM/DD/YY): 02/02/18

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

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

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

10419237

Page: 2 of 2

2258734

Section A Required Client Information:

Company: WSP
Address: 123 North 3rd St. Ste 507
Minneapolis, MN 55401
Email To: Paula Berger
Phone: 612 343-0570 Fax:
Requested Due Date/TAT: MnDOT 5-day

Section B Required Project Information:

Report To: Paula Berger
Copy To: Kevin Walter
Purchase Order No.:
Project Name: I35W MN River Bridge
Project Number: 3140159.001

Section C Invoice Information:

Attention: Accounts Payable
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Bob Michels
Pace Profile #: 27017

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: Priority Poll. metals	DRO Silica gel cleanup	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	DP-35 (2-3)	SL	G			2-1-2018	1330		1	X								X			013
2	DP-35 (8.5-9.5)	SL	G				1340		1	X								X			014
3	DP-36 (4-5)						1355		3	X								X	X		015
4	DP-36 (9-10)						1405		1	X								X			016
5	DP-37 (4-5)						1420		3	X								X	X		017
6	DP-37 (8.5-10)						1440		1	X								X			018
7	DP-38 (4-5)						1500		1	X								X			019
8	DP-38 (7-8.5)						1510		1	X								X			020
9																					
10																					
11																					
12																					

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Run DRO with silica gel cleanup	WSP	2-2-18	1345	PACE	2-2-18	1345	0.8	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Kevin Walter
SIGNATURE of SAMPLER:
DATE Signed (MM/DD/YY): 02/01/18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 14Dec2017 Page 1 of 2
	Document No.: **F-MN-L-213-rev.22**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: WSP

Project #: WO# : 10419237

10419237

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

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No **Optional:** Proj. Due Date: Proj. Name:

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

Thermometer Used: ☑ 151401163 ☐ G87A9155100842 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 1.0 **Cooler Temp Corrected (°C):** 0.8 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** ME 2/2/18

USDA Regulated Soil (☐ N/A, water sample)

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?	☑ 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?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No		12.
-Includes Date/Time/ID/Analysis Matrix: SL				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☑ N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	☐ Yes	☐ No	☑ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
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: BLM **Date:** 2/2/18

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
(612)607-1700

February 20, 2018

Ms. Paula Berger
WSP Environment and Energy
123 North Third Street
Suite 808
Minneapolis, MN 55401

RE: Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Dear Ms. Berger:
Enclosed are the analytical results for sample(s) received by the laboratory on February 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

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

CERTIFICATIONS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
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 #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
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 NwTPH 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
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

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

SAMPLE SUMMARY

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10420484001	**DP-22 (2-3)**	Solid	02/10/18 14:00	02/13/18 10:40
10420484002	**DP-22 (9-10)**	Solid	02/10/18 14:05	02/13/18 10:40
10420484003	**DP-21 (2-3)**	Solid	02/10/18 14:25	02/13/18 10:40
10420484004	**DP-21 (9-10)**	Solid	02/10/18 14:30	02/13/18 10:40
10420484005	**DP-23 (2-3)**	Solid	02/10/18 15:30	02/13/18 10:40
10420484006	**DP-23 (9-10)**	Solid	02/10/18 15:35	02/13/18 10:40
10420484007	**DP-24 (2-3)**	Solid	02/11/18 09:10	02/13/18 10:40
10420484008	**DP-24 (20-22)**	Solid	02/11/18 09:30	02/13/18 10:40
10420484009	**DP-24**	Water	02/11/18 10:00	02/13/18 10:40
10420484010	**DP-27 (2-3)**	Solid	02/11/18 15:15	02/13/18 10:40
10420484011	**DP-27 (20-21)**	Solid	02/11/18 15:50	02/13/18 10:40
10420484012	**DP-26 (3-4)**	Solid	02/11/18 16:40	02/13/18 10:40
10420484013	**DP-26 (14-16)**	Solid	02/11/18 16:55	02/13/18 10:40
10420484014	**DP-26**	Water	02/11/18 17:05	02/13/18 10:40
10420484015	**DP-25 (2-3)**	Solid	02/12/18 08:30	02/13/18 10:40
10420484016	**DP-25 (16-17)**	Solid	02/12/18 08:55	02/13/18 10:40
10420484017	**DP-25**	Water	02/12/18 09:10	02/13/18 10:40
10420484018	**DP-18 (2-3)**	Solid	02/12/18 10:50	02/13/18 10:40
10420484019	**DP-18 (9-10)**	Solid	02/12/18 10:55	02/13/18 10:40
10420484020	**DP-19 (2-3)**	Solid	02/12/18 12:30	02/13/18 10:40
10420484021	**DP-19 (9-10)**	Solid	02/12/18 12:50	02/13/18 10:40
10420484022	**DP-20 (2-3)**	Solid	02/12/18 13:30	02/13/18 10:40
10420484023	**DP-20 (9-10)**	Solid	02/12/18 13:45	02/13/18 10:40

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10420484001	**DP-22 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484002	**DP-22 (9-10)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484003	**DP-21 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484004	**DP-21 (9-10)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484005	**DP-23 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484006	**DP-23 (9-10)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484007	**DP-24 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484008	**DP-24 (20-22)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484009	**DP-24**	6010C Met	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7470A	LMW	1	PASI-M
10420484010	**DP-27 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M

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SAMPLE ANALYTE COUNT

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484011	**DP-27 (20-21)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484012	**DP-26 (3-4)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484013	**DP-26 (14-16)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484014	**DP-26**	6010C Met	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7470A	LMW	1	PASI-M
10420484015	**DP-25 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484016	**DP-25 (16-17)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484017	**DP-25**	6010C Met	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7470A	LMW	1	PASI-M
10420484018	**DP-18 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484019	**DP-18 (9-10)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484020	**DP-19 (2-3)**	EPA 6010C	BD1	10	PASI-M

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SAMPLE ANALYTE COUNT

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484021	**DP-19 (9-10)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484022	**DP-20 (2-3)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10420484023	**DP-20 (9-10)**	EPA 6010C	BD1	10	PASI-M
		EPA 6020A	RJS	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-22 (2-3) **Lab ID: 10420484001** Collected: 02/10/18 14:00 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	4.9	0.57	5	02/14/18 09:16	02/16/18 15:10	7440-36-0	D3,M1
Beryllium	ND	mg/kg	1.2	0.15	5	02/14/18 09:16	02/16/18 15:10	7440-41-7	D3
Cadmium	**0.096J**	mg/kg	0.74	0.076	5	02/14/18 09:16	02/16/18 15:10	7440-43-9	D3
Chromium	**7.1**	mg/kg	2.5	0.32	5	02/14/18 09:16	02/16/18 15:10	7440-47-3	
Copper	**8.7**	mg/kg	2.5	0.41	5	02/14/18 09:16	02/16/18 15:10	7440-50-8	
Lead	**2.9**	mg/kg	2.5	0.56	5	02/14/18 09:16	02/16/18 15:10	7439-92-1	
Nickel	**8.1**	mg/kg	4.9	0.58	5	02/14/18 09:16	02/16/18 15:10	7440-02-0	
Silver	ND	mg/kg	2.5	0.19	5	02/14/18 09:16	02/16/18 15:10	7440-22-4	D3
Thallium	ND	mg/kg	4.9	1.1	5	02/14/18 09:16	02/16/18 15:10	7440-28-0	D3
Zinc	**15.6**	mg/kg	4.9	1.4	5	02/14/18 09:16	02/16/18 15:10	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.7**	mg/kg	0.52	0.24	20	02/15/18 07:32	02/17/18 03:26	7440-38-2	
Selenium	**0.38J**	mg/kg	0.52	0.26	20	02/15/18 07:32	02/17/18 03:26	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.019	0.0086	1	02/14/18 05:58	02/19/18 15:00	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**4.7**	%	0.10	0.10	1		02/15/18 10:49		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-22 (9-10) **Lab ID: 10420484002** Collected: 02/10/18 14:05 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.46J**	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 15:36	7440-36-0	B
Beryllium	ND	mg/kg	0.27	0.032	1	02/14/18 09:16	02/16/18 15:36	7440-41-7	
Cadmium	**0.058J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 15:36	7440-43-9	
Chromium	**4.3**	mg/kg	0.53	0.068	1	02/14/18 09:16	02/16/18 15:36	7440-47-3	
Copper	**5.0**	mg/kg	0.53	0.089	1	02/14/18 09:16	02/16/18 15:36	7440-50-8	
Lead	**2.5**	mg/kg	0.53	0.12	1	02/14/18 09:16	02/16/18 15:36	7439-92-1	
Nickel	**7.3**	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 15:36	7440-02-0	
Silver	ND	mg/kg	0.53	0.042	1	02/14/18 09:16	02/16/18 15:36	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/14/18 09:16	02/16/18 15:36	7440-28-0	
Zinc	**11.1**	mg/kg	1.1	0.31	1	02/14/18 09:16	02/16/18 15:36	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.3**	mg/kg	0.49	0.22	20	02/15/18 07:32	02/17/18 03:22	7440-38-2	
Selenium	**0.28J**	mg/kg	0.49	0.25	20	02/15/18 07:32	02/17/18 03:22	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.021	0.0099	1	02/14/18 05:58	02/19/18 15:06	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**6.4**	%	0.10	0.10	1		02/15/18 10:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-21 (2-3) **Lab ID: 10420484003** Collected: 02/10/18 14:25 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.41J**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:39	7440-36-0	B
Beryllium	**0.044J**	mg/kg	0.26	0.032	1	02/14/18 09:16	02/16/18 15:39	7440-41-7	
Cadmium	**0.053J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 15:39	7440-43-9	
Chromium	**7.5**	mg/kg	0.52	0.067	1	02/14/18 09:16	02/16/18 15:39	7440-47-3	
Copper	**6.8**	mg/kg	0.52	0.088	1	02/14/18 09:16	02/16/18 15:39	7440-50-8	
Lead	**6.1**	mg/kg	0.52	0.12	1	02/14/18 09:16	02/16/18 15:39	7439-92-1	
Nickel	**8.2**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:39	7440-02-0	
Silver	ND	mg/kg	0.52	0.041	1	02/14/18 09:16	02/16/18 15:39	7440-22-4	
Thallium	**0.27J**	mg/kg	1.0	0.23	1	02/14/18 09:16	02/16/18 15:39	7440-28-0	
Zinc	**17.3**	mg/kg	1.0	0.30	1	02/14/18 09:16	02/16/18 15:39	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.7**	mg/kg	0.52	0.23	20	02/15/18 07:32	02/17/18 03:56	7440-38-2	
Selenium	**0.49J**	mg/kg	0.52	0.26	20	02/15/18 07:32	02/17/18 03:56	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.013J**	mg/kg	0.021	0.0096	1	02/14/18 05:58	02/19/18 15:09	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**9.0**	%	0.10	0.10	1		02/15/18 10:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-21 (9-10) **Lab ID: 10420484004** Collected: 02/10/18 14:30 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.24J**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 15:42	7440-36-0	
Beryllium	**0.049J**	mg/kg	0.27	0.033	1	02/14/18 09:16	02/16/18 15:42	7440-41-7	
Cadmium	**0.077J**	mg/kg	0.16	0.017	1	02/14/18 09:16	02/16/18 15:42	7440-43-9	
Chromium	**5.8**	mg/kg	0.54	0.069	1	02/14/18 09:16	02/16/18 15:42	7440-47-3	
Copper	**6.5**	mg/kg	0.54	0.091	1	02/14/18 09:16	02/16/18 15:42	7440-50-8	
Lead	**4.1**	mg/kg	0.54	0.12	1	02/14/18 09:16	02/16/18 15:42	7439-92-1	
Nickel	**8.5**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 15:42	7440-02-0	
Silver	ND	mg/kg	0.54	0.042	1	02/14/18 09:16	02/16/18 15:42	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/14/18 09:16	02/16/18 15:42	7440-28-0	
Zinc	**15.8**	mg/kg	1.1	0.32	1	02/14/18 09:16	02/16/18 15:42	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**3.7**	mg/kg	0.54	0.25	20	02/15/18 07:32	02/17/18 04:00	7440-38-2	
Selenium	**0.71**	mg/kg	0.54	0.27	20	02/15/18 07:32	02/17/18 04:00	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.013J**	mg/kg	0.020	0.0093	1	02/14/18 05:58	02/19/18 15:11	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**11.4**	%	0.10	0.10	1		02/15/18 10:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-23 (2-3) **Lab ID: 10420484005** Collected: 02/10/18 15:30 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.18J**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:44	7440-36-0	B
Beryllium	ND	mg/kg	0.26	0.031	1	02/14/18 09:16	02/16/18 15:44	7440-41-7	
Cadmium	**0.089J**	mg/kg	0.15	0.016	1	02/14/18 09:16	02/16/18 15:44	7440-43-9	
Chromium	**4.5**	mg/kg	0.52	0.066	1	02/14/18 09:16	02/16/18 15:44	7440-47-3	
Copper	**9.8**	mg/kg	0.52	0.086	1	02/14/18 09:16	02/16/18 15:44	7440-50-8	
Lead	**2.3**	mg/kg	0.52	0.12	1	02/14/18 09:16	02/16/18 15:44	7439-92-1	
Nickel	**7.5**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:44	7440-02-0	
Silver	**0.046J**	mg/kg	0.52	0.040	1	02/14/18 09:16	02/16/18 15:44	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/14/18 09:16	02/16/18 15:44	7440-28-0	
Zinc	**12.0**	mg/kg	1.0	0.30	1	02/14/18 09:16	02/16/18 15:44	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.9**	mg/kg	0.53	0.24	20	02/15/18 07:32	02/17/18 04:04	7440-38-2	
Selenium	**0.44J**	mg/kg	0.53	0.26	20	02/15/18 07:32	02/17/18 04:04	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.019	0.0086	1	02/14/18 05:58	02/19/18 15:17	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**5.0**	%	0.10	0.10	1		02/15/18 10:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-23 (9-10) **Lab ID: 10420484006** Collected: 02/10/18 15:35 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.12J**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:47	7440-36-0	B
Beryllium	ND	mg/kg	0.26	0.031	1	02/14/18 09:16	02/16/18 15:47	7440-41-7	
Cadmium	**0.060J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 15:47	7440-43-9	
Chromium	**4.1**	mg/kg	0.52	0.066	1	02/14/18 09:16	02/16/18 15:47	7440-47-3	
Copper	**3.5**	mg/kg	0.52	0.087	1	02/14/18 09:16	02/16/18 15:47	7440-50-8	
Lead	**2.1**	mg/kg	0.52	0.12	1	02/14/18 09:16	02/16/18 15:47	7439-92-1	
Nickel	**7.8**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:47	7440-02-0	
Silver	**0.041J**	mg/kg	0.52	0.040	1	02/14/18 09:16	02/16/18 15:47	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/14/18 09:16	02/16/18 15:47	7440-28-0	
Zinc	**10.1**	mg/kg	1.0	0.30	1	02/14/18 09:16	02/16/18 15:47	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.7**	mg/kg	0.50	0.23	20	02/15/18 07:32	02/17/18 04:08	7440-38-2	
Selenium	**0.33J**	mg/kg	0.50	0.25	20	02/15/18 07:32	02/17/18 04:08	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.020	0.0094	1	02/14/18 05:58	02/19/18 15:19	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**4.5**	%	0.10	0.10	1		02/15/18 10:50		

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-24 (2-3) **Lab ID: 10420484007** Collected: 02/11/18 09:10 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.38J**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 15:50	7440-36-0	
Beryllium	**0.11J**	mg/kg	0.28	0.033	1	02/14/18 09:16	02/16/18 15:50	7440-41-7	
Cadmium	**0.15J**	mg/kg	0.17	0.017	1	02/14/18 09:16	02/16/18 15:50	7440-43-9	
Chromium	**9.1**	mg/kg	0.55	0.070	1	02/14/18 09:16	02/16/18 15:50	7440-47-3	
Copper	**10.7**	mg/kg	0.55	0.092	1	02/14/18 09:16	02/16/18 15:50	7440-50-8	
Lead	**5.3**	mg/kg	0.55	0.12	1	02/14/18 09:16	02/16/18 15:50	7439-92-1	
Nickel	**14.0**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 15:50	7440-02-0	
Silver	**0.052J**	mg/kg	0.55	0.043	1	02/14/18 09:16	02/16/18 15:50	7440-22-4	
Thallium	ND	mg/kg	1.1	0.24	1	02/14/18 09:16	02/16/18 15:50	7440-28-0	
Zinc	**23.3**	mg/kg	1.1	0.32	1	02/14/18 09:16	02/16/18 15:50	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**5.9**	mg/kg	0.57	0.26	20	02/15/18 07:32	02/17/18 04:12	7440-38-2	
Selenium	**0.83**	mg/kg	0.57	0.28	20	02/15/18 07:32	02/17/18 04:12	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.024**	mg/kg	0.021	0.0099	1	02/14/18 05:58	02/19/18 15:21	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**14.3**	%	0.10	0.10	1		02/15/18 10:51		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-24 (20-22) **Lab ID: 10420484008** Collected: 02/11/18 09:30 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 15:53	7440-36-0	
Beryllium	ND	mg/kg	0.28	0.034	1	02/14/18 09:16	02/16/18 15:53	7440-41-7	
Cadmium	**0.036J**	mg/kg	0.17	0.017	1	02/14/18 09:16	02/16/18 15:53	7440-43-9	
Chromium	**4.3**	mg/kg	0.56	0.071	1	02/14/18 09:16	02/16/18 15:53	7440-47-3	
Copper	**3.6**	mg/kg	0.56	0.094	1	02/14/18 09:16	02/16/18 15:53	7440-50-8	
Lead	**3.0**	mg/kg	0.56	0.13	1	02/14/18 09:16	02/16/18 15:53	7439-92-1	
Nickel	**4.2**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 15:53	7440-02-0	
Silver	ND	mg/kg	0.56	0.044	1	02/14/18 09:16	02/16/18 15:53	7440-22-4	
Thallium	ND	mg/kg	1.1	0.24	1	02/14/18 09:16	02/16/18 15:53	7440-28-0	
Zinc	**12.0**	mg/kg	1.1	0.33	1	02/14/18 09:16	02/16/18 15:53	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.7**	mg/kg	0.56	0.25	20	02/15/18 07:32	02/17/18 04:16	7440-38-2	
Selenium	**0.41J**	mg/kg	0.56	0.28	20	02/15/18 07:32	02/17/18 04:16	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.023	0.011	1	02/14/18 05:58	02/19/18 15:23	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**14.3**	%	0.10	0.10	1		02/15/18 10:51		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-24 **Lab ID: 10420484009** Collected: 02/11/18 10:00 Received: 02/13/18 10:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP, Dissolved	Analytical Method: 6010C Met Preparation Method: EPA 3010								
Antimony, Dissolved	**3.3J**	ug/L	20.0	3.1	1	02/15/18 12:04	02/16/18 17:01	7440-36-0	
Beryllium, Dissolved	**0.15J**	ug/L	5.0	0.11	1	02/15/18 12:04	02/16/18 17:01	7440-41-7	
Cadmium, Dissolved	**0.72J**	ug/L	3.0	0.46	1	02/15/18 12:04	02/16/18 17:01	7440-43-9	
Chromium, Dissolved	ND	ug/L	10.0	0.50	1	02/15/18 12:04	02/16/18 17:01	7440-47-3	
Copper, Dissolved	**3.5J**	ug/L	10.0	0.83	1	02/15/18 12:04	02/16/18 17:01	7440-50-8	
Lead, Dissolved	ND	ug/L	10.0	3.0	1	02/15/18 12:04	02/16/18 17:01	7439-92-1	
Nickel, Dissolved	**39.0**	ug/L	20.0	1.1	1	02/15/18 12:04	02/16/18 17:01	7440-02-0	
Silver, Dissolved	**0.55J**	ug/L	10.0	0.27	1	02/15/18 12:04	02/16/18 17:01	7440-22-4	
Thallium, Dissolved	**8.6J**	ug/L	20.0	4.8	1	02/15/18 12:04	02/16/18 17:01	7440-28-0	
Zinc, Dissolved	**3.8J**	ug/L	20.0	1.8	1	02/15/18 12:04	02/16/18 17:01	7440-66-6	
6020A MET ICPMS, Dissolved	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Arsenic, Dissolved	ND	ug/L	0.50	0.21	1	02/15/18 12:04	02/19/18 22:30	7440-38-2	
Selenium, Dissolved	ND	ug/L	0.50	0.17	1	02/15/18 12:04	02/19/18 22:30	7782-49-2	
7470A Mercury, Dissolved	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury, Dissolved	ND	ug/L	0.20	0.062	1	02/15/18 12:32	02/15/18 15:50	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-27 (2-3) **Lab ID: 10420484010** Collected: 02/11/18 15:15 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.37J**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:56	7440-36-0	B
Beryllium	ND	mg/kg	0.26	0.031	1	02/14/18 09:16	02/16/18 15:56	7440-41-7	
Cadmium	**0.069J**	mg/kg	0.15	0.016	1	02/14/18 09:16	02/16/18 15:56	7440-43-9	
Chromium	**4.1**	mg/kg	0.51	0.066	1	02/14/18 09:16	02/16/18 15:56	7440-47-3	
Copper	**2.2**	mg/kg	0.51	0.086	1	02/14/18 09:16	02/16/18 15:56	7440-50-8	
Lead	**2.4**	mg/kg	0.51	0.12	1	02/14/18 09:16	02/16/18 15:56	7439-92-1	
Nickel	**5.4**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 15:56	7440-02-0	
Silver	ND	mg/kg	0.51	0.040	1	02/14/18 09:16	02/16/18 15:56	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/14/18 09:16	02/16/18 15:56	7440-28-0	
Zinc	**11.1**	mg/kg	1.0	0.30	1	02/14/18 09:16	02/16/18 15:56	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.7**	mg/kg	0.50	0.23	20	02/15/18 07:32	02/17/18 04:19	7440-38-2	
Selenium	**0.47J**	mg/kg	0.50	0.25	20	02/15/18 07:32	02/17/18 04:19	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.019	0.0091	1	02/14/18 05:58	02/19/18 15:25	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**6.5**	%	0.10	0.10	1		02/15/18 10:51		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-27 (20-21) **Lab ID: 10420484011** Collected: 02/11/18 15:50 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.26J**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 16:06	7440-36-0	
Beryllium	**0.048J**	mg/kg	0.27	0.033	1	02/14/18 09:16	02/16/18 16:06	7440-41-7	
Cadmium	**0.072J**	mg/kg	0.16	0.017	1	02/14/18 09:16	02/16/18 16:06	7440-43-9	
Chromium	**7.3**	mg/kg	0.54	0.069	1	02/14/18 09:16	02/16/18 16:06	7440-47-3	
Copper	**7.0**	mg/kg	0.54	0.091	1	02/14/18 09:16	02/16/18 16:06	7440-50-8	
Lead	**3.8**	mg/kg	0.54	0.12	1	02/14/18 09:16	02/16/18 16:06	7439-92-1	
Nickel	**9.4**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 16:06	7440-02-0	
Silver	ND	mg/kg	0.54	0.042	1	02/14/18 09:16	02/16/18 16:06	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/14/18 09:16	02/16/18 16:06	7440-28-0	
Zinc	**17.7**	mg/kg	1.1	0.32	1	02/14/18 09:16	02/16/18 16:06	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**3.4**	mg/kg	0.57	0.26	20	02/15/18 07:32	02/17/18 04:23	7440-38-2	
Selenium	**0.57**	mg/kg	0.57	0.29	20	02/15/18 07:32	02/17/18 04:23	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.019J**	mg/kg	0.022	0.010	1	02/14/18 05:58	02/19/18 15:27	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**13.2**	%	0.10	0.10	1		02/15/18 10:51		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-26 (3-4) **Lab ID: 10420484012** Collected: 02/11/18 16:40 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.33J**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 16:08	7440-36-0	B
Beryllium	ND	mg/kg	0.26	0.032	1	02/14/18 09:16	02/16/18 16:08	7440-41-7	
Cadmium	**0.044J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 16:08	7440-43-9	
Chromium	**3.7**	mg/kg	0.52	0.067	1	02/14/18 09:16	02/16/18 16:08	7440-47-3	
Copper	**1.6**	mg/kg	0.52	0.088	1	02/14/18 09:16	02/16/18 16:08	7440-50-8	
Lead	**2.2**	mg/kg	0.52	0.12	1	02/14/18 09:16	02/16/18 16:08	7439-92-1	
Nickel	**4.0**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 16:08	7440-02-0	
Silver	ND	mg/kg	0.52	0.041	1	02/14/18 09:16	02/16/18 16:08	7440-22-4	
Thallium	ND	mg/kg	1.0	0.23	1	02/14/18 09:16	02/16/18 16:08	7440-28-0	
Zinc	**9.9**	mg/kg	1.0	0.31	1	02/14/18 09:16	02/16/18 16:08	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.5**	mg/kg	0.55	0.25	20	02/15/18 07:32	02/17/18 04:27	7440-38-2	
Selenium	**0.35J**	mg/kg	0.55	0.27	20	02/15/18 07:32	02/17/18 04:27	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.021	0.0098	1	02/14/18 05:58	02/19/18 15:29	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**8.4**	%	0.10	0.10	1		02/15/18 10:51		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-26 (14-16) **Lab ID: 10420484013** Collected: 02/11/18 16:55 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 16:11	7440-36-0	
Beryllium	ND	mg/kg	0.26	0.032	1	02/14/18 09:16	02/16/18 16:11	7440-41-7	
Cadmium	**0.053J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 16:11	7440-43-9	
Chromium	**5.9**	mg/kg	0.53	0.067	1	02/14/18 09:16	02/16/18 16:11	7440-47-3	
Copper	**7.0**	mg/kg	0.53	0.088	1	02/14/18 09:16	02/16/18 16:11	7440-50-8	
Lead	**2.9**	mg/kg	0.53	0.12	1	02/14/18 09:16	02/16/18 16:11	7439-92-1	
Nickel	**7.2**	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 16:11	7440-02-0	
Silver	ND	mg/kg	0.53	0.041	1	02/14/18 09:16	02/16/18 16:11	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/14/18 09:16	02/16/18 16:11	7440-28-0	
Zinc	**13.3**	mg/kg	1.1	0.31	1	02/14/18 09:16	02/16/18 16:11	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.7**	mg/kg	0.53	0.24	20	02/15/18 07:32	02/17/18 04:31	7440-38-2	
Selenium	**0.41J**	mg/kg	0.53	0.26	20	02/15/18 07:32	02/17/18 04:31	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.023	0.011	1	02/14/18 05:58	02/19/18 15:31	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**12.3**	%	0.10	0.10	1		02/15/18 10:52		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-26 **Lab ID: 10420484014** Collected: 02/11/18 17:05 Received: 02/13/18 10:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP, Dissolved	Analytical Method: 6010C Met Preparation Method: EPA 3010								
Antimony, Dissolved	**3.2J**	ug/L	20.0	3.1	1	02/15/18 12:04	02/16/18 17:15	7440-36-0	
Beryllium, Dissolved	ND	ug/L	5.0	0.11	1	02/15/18 12:04	02/16/18 17:15	7440-41-7	
Cadmium, Dissolved	ND	ug/L	3.0	0.46	1	02/15/18 12:04	02/16/18 17:15	7440-43-9	
Chromium, Dissolved	ND	ug/L	10.0	0.50	1	02/15/18 12:04	02/16/18 17:15	7440-47-3	
Copper, Dissolved	**2.6J**	ug/L	10.0	0.83	1	02/15/18 12:04	02/16/18 17:15	7440-50-8	
Lead, Dissolved	ND	ug/L	10.0	3.0	1	02/15/18 12:04	02/16/18 17:15	7439-92-1	
Nickel, Dissolved	**15.8J**	ug/L	20.0	1.1	1	02/15/18 12:04	02/16/18 17:15	7440-02-0	
Silver, Dissolved	**0.29J**	ug/L	10.0	0.27	1	02/15/18 12:04	02/16/18 17:15	7440-22-4	
Thallium, Dissolved	**8.6J**	ug/L	20.0	4.8	1	02/15/18 12:04	02/16/18 17:15	7440-28-0	
Zinc, Dissolved	**2.9J**	ug/L	20.0	1.8	1	02/15/18 12:04	02/16/18 17:15	7440-66-6	
6020A MET ICPMS, Dissolved	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Arsenic, Dissolved	**3.2**	ug/L	0.50	0.21	1	02/15/18 12:04	02/19/18 22:35	7440-38-2	
Selenium, Dissolved	**0.48J**	ug/L	0.50	0.17	1	02/15/18 12:04	02/19/18 22:35	7782-49-2	
7470A Mercury, Dissolved	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury, Dissolved	ND	ug/L	0.20	0.062	1	02/15/18 12:32	02/15/18 15:52	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-25 (2-3) **Lab ID: 10420484015** Collected: 02/12/18 08:30 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 16:14	7440-36-0	
Beryllium	**0.091J**	mg/kg	0.28	0.033	1	02/14/18 09:16	02/16/18 16:14	7440-41-7	
Cadmium	**0.14J**	mg/kg	0.17	0.017	1	02/14/18 09:16	02/16/18 16:14	7440-43-9	
Chromium	**13.9**	mg/kg	0.55	0.070	1	02/14/18 09:16	02/16/18 16:14	7440-47-3	
Copper	**13.8**	mg/kg	0.55	0.092	1	02/14/18 09:16	02/16/18 16:14	7440-50-8	
Lead	**13.7**	mg/kg	0.55	0.12	1	02/14/18 09:16	02/16/18 16:14	7439-92-1	
Nickel	**10.7**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 16:14	7440-02-0	
Silver	**0.059J**	mg/kg	0.55	0.043	1	02/14/18 09:16	02/16/18 16:14	7440-22-4	
Thallium	**0.27J**	mg/kg	1.1	0.24	1	02/14/18 09:16	02/16/18 16:14	7440-28-0	
Zinc	**27.8**	mg/kg	1.1	0.32	1	02/14/18 09:16	02/16/18 16:14	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.5**	mg/kg	0.57	0.26	20	02/15/18 07:32	02/17/18 04:42	7440-38-2	
Selenium	**0.47J**	mg/kg	0.57	0.29	20	02/15/18 07:32	02/17/18 04:42	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.029**	mg/kg	0.020	0.0095	1	02/14/18 05:58	02/19/18 15:37	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**13.5**	%	0.10	0.10	1		02/15/18 10:52		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-25 (16-17) **Lab ID: 10420484016** Collected: 02/12/18 08:55 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.12J**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 16:17	7440-36-0	B
Beryllium	ND	mg/kg	0.26	0.031	1	02/14/18 09:16	02/16/18 16:17	7440-41-7	
Cadmium	**0.058J**	mg/kg	0.15	0.016	1	02/14/18 09:16	02/16/18 16:17	7440-43-9	
Chromium	**6.2**	mg/kg	0.51	0.066	1	02/14/18 09:16	02/16/18 16:17	7440-47-3	
Copper	**7.0**	mg/kg	0.51	0.086	1	02/14/18 09:16	02/16/18 16:17	7440-50-8	
Lead	**3.4**	mg/kg	0.51	0.12	1	02/14/18 09:16	02/16/18 16:17	7439-92-1	
Nickel	**8.3**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 16:17	7440-02-0	
Silver	ND	mg/kg	0.51	0.040	1	02/14/18 09:16	02/16/18 16:17	7440-22-4	
Thallium	ND	mg/kg	1.0	0.22	1	02/14/18 09:16	02/16/18 16:17	7440-28-0	
Zinc	**17.3**	mg/kg	1.0	0.30	1	02/14/18 09:16	02/16/18 16:17	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.8**	mg/kg	0.53	0.24	20	02/15/18 07:32	02/17/18 04:46	7440-38-2	
Selenium	**0.48J**	mg/kg	0.53	0.26	20	02/15/18 07:32	02/17/18 04:46	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.013J**	mg/kg	0.020	0.0092	1	02/14/18 05:58	02/19/18 15:40	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**8.3**	%	0.10	0.10	1		02/15/18 10:52		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-25 **Lab ID: 10420484017** Collected: 02/12/18 09:10 Received: 02/13/18 10:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP, Dissolved	Analytical Method: 6010C Met Preparation Method: EPA 3010								
Antimony, Dissolved	ND	ug/L	20.0	3.1	1	02/15/18 12:04	02/16/18 17:18	7440-36-0	
Beryllium, Dissolved	ND	ug/L	5.0	0.11	1	02/15/18 12:04	02/16/18 17:18	7440-41-7	
Cadmium, Dissolved	ND	ug/L	3.0	0.46	1	02/15/18 12:04	02/16/18 17:18	7440-43-9	
Chromium, Dissolved	ND	ug/L	10.0	0.50	1	02/15/18 12:04	02/16/18 17:18	7440-47-3	
Copper, Dissolved	**2.6J**	ug/L	10.0	0.83	1	02/15/18 12:04	02/16/18 17:18	7440-50-8	
Lead, Dissolved	ND	ug/L	10.0	3.0	1	02/15/18 12:04	02/16/18 17:18	7439-92-1	
Nickel, Dissolved	**12.7J**	ug/L	20.0	1.1	1	02/15/18 12:04	02/16/18 17:18	7440-02-0	
Silver, Dissolved	**0.28J**	ug/L	10.0	0.27	1	02/15/18 12:04	02/16/18 17:18	7440-22-4	
Thallium, Dissolved	**6.2J**	ug/L	20.0	4.8	1	02/15/18 12:04	02/16/18 17:18	7440-28-0	
Zinc, Dissolved	**2.4J**	ug/L	20.0	1.8	1	02/15/18 12:04	02/16/18 17:18	7440-66-6	
6020A MET ICPMS, Dissolved	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Arsenic, Dissolved	**0.22J**	ug/L	0.50	0.21	1	02/15/18 12:04	02/19/18 22:25	7440-38-2	
Selenium, Dissolved	ND	ug/L	0.50	0.17	1	02/15/18 12:04	02/19/18 22:25	7782-49-2	
7470A Mercury, Dissolved	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury, Dissolved	ND	ug/L	0.20	0.062	1	02/15/18 12:32	02/15/18 15:55	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-18 (2-3) **Lab ID: 10420484018** Collected: 02/12/18 10:50 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 16:20	7440-36-0	
Beryllium	**0.040J**	mg/kg	0.26	0.032	1	02/14/18 09:16	02/16/18 16:20	7440-41-7	
Cadmium	**0.21**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 16:20	7440-43-9	
Chromium	**12.5**	mg/kg	0.53	0.067	1	02/14/18 09:16	02/16/18 16:20	7440-47-3	
Copper	**14.4**	mg/kg	0.53	0.089	1	02/14/18 09:16	02/16/18 16:20	7440-50-8	
Lead	**55.0**	mg/kg	0.53	0.12	1	02/14/18 09:16	02/16/18 16:20	7439-92-1	
Nickel	**10.1**	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 16:20	7440-02-0	
Silver	ND	mg/kg	0.53	0.041	1	02/14/18 09:16	02/16/18 16:20	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/14/18 09:16	02/16/18 16:20	7440-28-0	
Zinc	**53.2**	mg/kg	1.1	0.31	1	02/14/18 09:16	02/16/18 16:20	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**4.4**	mg/kg	0.55	0.25	20	02/15/18 07:32	02/17/18 04:50	7440-38-2	
Selenium	**0.59**	mg/kg	0.55	0.27	20	02/15/18 07:32	02/17/18 04:50	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.038**	mg/kg	0.021	0.0098	1	02/14/18 05:58	02/19/18 15:42	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**10.8**	%	0.10	0.10	1		02/15/18 10:52		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-18 (9-10) **Lab ID: 10420484019** Collected: 02/12/18 10:55 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 16:23	7440-36-0	
Beryllium	**0.035J**	mg/kg	0.27	0.032	1	02/14/18 09:16	02/16/18 16:23	7440-41-7	
Cadmium	**0.12J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 16:23	7440-43-9	
Chromium	**7.8**	mg/kg	0.54	0.069	1	02/14/18 09:16	02/16/18 16:23	7440-47-3	
Copper	**7.5**	mg/kg	0.54	0.090	1	02/14/18 09:16	02/16/18 16:23	7440-50-8	
Lead	**3.4**	mg/kg	0.54	0.12	1	02/14/18 09:16	02/16/18 16:23	7439-92-1	
Nickel	**7.8**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 16:23	7440-02-0	
Silver	ND	mg/kg	0.54	0.042	1	02/14/18 09:16	02/16/18 16:23	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/14/18 09:16	02/16/18 16:23	7440-28-0	
Zinc	**21.2**	mg/kg	1.1	0.31	1	02/14/18 09:16	02/16/18 16:23	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**3.0**	mg/kg	0.55	0.25	20	02/15/18 07:32	02/17/18 04:54	7440-38-2	
Selenium	**1.0**	mg/kg	0.55	0.27	20	02/15/18 07:32	02/17/18 04:54	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.017J**	mg/kg	0.020	0.0092	1	02/14/18 05:58	02/19/18 15:44	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**10.7**	%	0.10	0.10	1		02/15/18 12:43		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-19 (2-3) **Lab ID: 10420484020** Collected: 02/12/18 12:30 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	**0.17J**	mg/kg	0.98	0.11	1	02/14/18 09:16	02/16/18 16:25	7440-36-0	B
Beryllium	ND	mg/kg	0.25	0.030	1	02/14/18 09:16	02/16/18 16:25	7440-41-7	
Cadmium	**0.058J**	mg/kg	0.15	0.015	1	02/14/18 09:16	02/16/18 16:25	7440-43-9	
Chromium	**5.2**	mg/kg	0.49	0.063	1	02/14/18 09:16	02/16/18 16:25	7440-47-3	
Copper	**5.5**	mg/kg	0.49	0.082	1	02/14/18 09:16	02/16/18 16:25	7440-50-8	
Lead	**2.0**	mg/kg	0.49	0.11	1	02/14/18 09:16	02/16/18 16:25	7439-92-1	
Nickel	**6.5**	mg/kg	0.98	0.11	1	02/14/18 09:16	02/16/18 16:25	7440-02-0	
Silver	ND	mg/kg	0.49	0.038	1	02/14/18 09:16	02/16/18 16:25	7440-22-4	
Thallium	ND	mg/kg	0.98	0.21	1	02/14/18 09:16	02/16/18 16:25	7440-28-0	
Zinc	**11.1**	mg/kg	0.98	0.29	1	02/14/18 09:16	02/16/18 16:25	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**1.5**	mg/kg	0.52	0.24	20	02/15/18 07:32	02/17/18 04:58	7440-38-2	
Selenium	ND	mg/kg	0.52	0.26	20	02/15/18 07:32	02/17/18 04:58	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.019	0.0090	1	02/14/18 05:58	02/19/18 15:46	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**5.7**	%	0.10	0.10	1		02/15/18 12:44		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-19 (9-10) **Lab ID: 10420484021** Collected: 02/12/18 12:50 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 16:28	7440-36-0	
Beryllium	**0.060J**	mg/kg	0.26	0.031	1	02/14/18 09:16	02/16/18 16:28	7440-41-7	
Cadmium	**0.074J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 16:28	7440-43-9	
Chromium	**14.9**	mg/kg	0.52	0.067	1	02/14/18 09:16	02/16/18 16:28	7440-47-3	
Copper	**17.3**	mg/kg	0.52	0.087	1	02/14/18 09:16	02/16/18 16:28	7440-50-8	
Lead	**3.9**	mg/kg	0.52	0.12	1	02/14/18 09:16	02/16/18 16:28	7439-92-1	
Nickel	**14.2**	mg/kg	1.0	0.12	1	02/14/18 09:16	02/16/18 16:28	7440-02-0	
Silver	**0.054J**	mg/kg	0.52	0.041	1	02/14/18 09:16	02/16/18 16:28	7440-22-4	
Thallium	**0.28J**	mg/kg	1.0	0.23	1	02/14/18 09:16	02/16/18 16:28	7440-28-0	
Zinc	**21.9**	mg/kg	1.0	0.30	1	02/14/18 09:16	02/16/18 16:28	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.6**	mg/kg	0.54	0.25	20	02/15/18 07:32	02/17/18 05:02	7440-38-2	
Selenium	**0.55**	mg/kg	0.54	0.27	20	02/15/18 07:32	02/17/18 05:02	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.012J**	mg/kg	0.020	0.0093	1	02/14/18 05:58	02/19/18 15:48	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**11.4**	%	0.10	0.10	1		02/15/18 12:44		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-20 (2-3) **Lab ID: 10420484022** Collected: 02/12/18 13:30 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 16:31	7440-36-0	B
Beryllium	ND	mg/kg	0.27	0.032	1	02/14/18 09:16	02/16/18 16:31	7440-41-7	
Cadmium	**0.085J**	mg/kg	0.16	0.016	1	02/14/18 09:16	02/16/18 16:31	7440-43-9	
Chromium	**5.9**	mg/kg	0.53	0.068	1	02/14/18 09:16	02/16/18 16:31	7440-47-3	
Copper	**6.0**	mg/kg	0.53	0.089	1	02/14/18 09:16	02/16/18 16:31	7440-50-8	
Lead	**5.1**	mg/kg	0.53	0.12	1	02/14/18 09:16	02/16/18 16:31	7439-92-1	
Nickel	**6.2**	mg/kg	1.1	0.12	1	02/14/18 09:16	02/16/18 16:31	7440-02-0	
Silver	ND	mg/kg	0.53	0.042	1	02/14/18 09:16	02/16/18 16:31	7440-22-4	
Thallium	ND	mg/kg	1.1	0.23	1	02/14/18 09:16	02/16/18 16:31	7440-28-0	
Zinc	**24.3**	mg/kg	1.1	0.31	1	02/14/18 09:16	02/16/18 16:31	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**2.2**	mg/kg	0.53	0.24	20	02/15/18 07:32	02/17/18 05:05	7440-38-2	
Selenium	**0.33J**	mg/kg	0.53	0.26	20	02/15/18 07:32	02/17/18 05:05	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.011J**	mg/kg	0.020	0.0093	1	02/14/18 05:58	02/19/18 15:50	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**8.8**	%	0.10	0.10	1		02/15/18 12:44		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Sample: DP-20 (9-10) **Lab ID: 10420484023** Collected: 02/12/18 13:45 Received: 02/13/18 10:40 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
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 16:53	7440-36-0	
Beryllium	**0.084J**	mg/kg	0.28	0.033	1	02/14/18 09:16	02/16/18 16:53	7440-41-7	
Cadmium	**0.13J**	mg/kg	0.17	0.017	1	02/14/18 09:16	02/16/18 16:53	7440-43-9	
Chromium	**9.7**	mg/kg	0.55	0.070	1	02/14/18 09:16	02/16/18 16:53	7440-47-3	
Copper	**9.9**	mg/kg	0.55	0.092	1	02/14/18 09:16	02/16/18 16:53	7440-50-8	
Lead	**5.0**	mg/kg	0.55	0.12	1	02/14/18 09:16	02/16/18 16:53	7439-92-1	
Nickel	**13.4**	mg/kg	1.1	0.13	1	02/14/18 09:16	02/16/18 16:53	7440-02-0	
Silver	ND	mg/kg	0.55	0.043	1	02/14/18 09:16	02/16/18 16:53	7440-22-4	
Thallium	ND	mg/kg	1.1	0.24	1	02/14/18 09:16	02/16/18 16:53	7440-28-0	
Zinc	**22.8**	mg/kg	1.1	0.32	1	02/14/18 09:16	02/16/18 16:53	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Arsenic	**3.5**	mg/kg	0.54	0.24	20	02/15/18 07:32	02/17/18 05:09	7440-38-2	
Selenium	**0.58**	mg/kg	0.54	0.27	20	02/15/18 07:32	02/17/18 05:09	7782-49-2	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	ND	mg/kg	0.021	0.0097	1	02/14/18 05:58	02/19/18 15:52	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974								
Percent Moisture	**12.9**	%	0.10	0.10	1		02/15/18 12:44		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 522980 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved
Associated Lab Samples: 10420484009, 10420484014, 10420484017

METHOD BLANK: 2839022 Matrix: Water
Associated Lab Samples: 10420484009, 10420484014, 10420484017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	0.062	02/15/18 15:46	

LABORATORY CONTROL SAMPLE: 2839023

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2839024 2839025

Parameter	Units	10420484017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	ND	5	5	5.0	5.1	99	102	80-120	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 522877 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids
Associated Lab Samples: 10420484001, 10420484002, 10420484003, 10420484004, 10420484005, 10420484006, 10420484007, 10420484008, 10420484010, 10420484011, 10420484012, 10420484013, 10420484015, 10420484016, 10420484018, 10420484019, 10420484020, 10420484021, 10420484022, 10420484023

METHOD BLANK: 2838615 Matrix: Solid
Associated Lab Samples: 10420484001, 10420484002, 10420484003, 10420484004, 10420484005, 10420484006, 10420484007, 10420484008, 10420484010, 10420484011, 10420484012, 10420484013, 10420484015, 10420484016, 10420484018, 10420484019, 10420484020, 10420484021, 10420484022, 10420484023

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.019	0.0090	02/19/18 14:56	

LABORATORY CONTROL SAMPLE: 2838616

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.46	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2838617 2838618

Parameter	Units	10420484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	.47	.49	0.47	0.49	97	97	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 522862 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10420484001, 10420484002, 10420484003, 10420484004, 10420484005, 10420484006, 10420484007, 10420484008, 10420484010, 10420484011, 10420484012, 10420484013, 10420484015, 10420484016, 10420484018, 10420484019, 10420484020, 10420484021, 10420484022, 10420484023

METHOD BLANK: 2838564 Matrix: Solid
Associated Lab Samples: 10420484001, 10420484002, 10420484003, 10420484004, 10420484005, 10420484006, 10420484007, 10420484008, 10420484010, 10420484011, 10420484012, 10420484013, 10420484015, 10420484016, 10420484018, 10420484019, 10420484020, 10420484021, 10420484022, 10420484023

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	mg/kg	0.12J	0.99	0.11	02/16/18 15:02	
Beryllium	mg/kg	ND	0.25	0.030	02/16/18 15:02	
Cadmium	mg/kg	ND	0.15	0.015	02/16/18 15:02	
Chromium	mg/kg	ND	0.50	0.063	02/16/18 15:02	
Copper	mg/kg	ND	0.50	0.083	02/16/18 15:02	
Lead	mg/kg	ND	0.50	0.11	02/16/18 15:02	
Nickel	mg/kg	ND	0.99	0.12	02/16/18 15:02	
Silver	mg/kg	ND	0.50	0.039	02/16/18 15:02	
Thallium	mg/kg	ND	0.99	0.21	02/16/18 15:02	
Zinc	mg/kg	ND	0.99	0.29	02/16/18 15:02	

LABORATORY CONTROL SAMPLE: 2838565

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	48.1	47.9	100	80-120	
Beryllium	mg/kg	48.1	46.2	96	80-120	
Cadmium	mg/kg	48.1	46.3	96	80-120	
Chromium	mg/kg	48.1	49.8	104	80-120	
Copper	mg/kg	48.1	48.7	101	80-120	
Lead	mg/kg	48.1	47.7	99	80-120	
Nickel	mg/kg	48.1	49.1	102	80-120	
Silver	mg/kg	24	22.8	95	80-120	
Thallium	mg/kg	48.1	48.4	101	80-120	
Zinc	mg/kg	48.1	47.1	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2838566 2838567

Parameter	Units	10420484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	ND	49.9	50.5	35.8	37.6	71	74	75-125	5	20	M1
Beryllium	mg/kg	ND	49.9	50.5	48.6	49.4	97	98	75-125	2	20	
Cadmium	mg/kg	0.096J	49.9	50.5	48.5	49.6	97	98	75-125	2	20	
Chromium	mg/kg	7.1	49.9	50.5	56.9	58.4	100	102	75-125	3	20	
Copper	mg/kg	8.7	49.9	50.5	57.0	57.9	97	98	75-125	2	20	
Lead	mg/kg	2.9	49.9	50.5	51.3	52.6	97	99	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2838566 2838567

Parameter	Units	10420484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nickel	mg/kg	8.1	49.9	50.5	57.3	58.7	98	100	75-125	2	20	
Silver	mg/kg	ND	25	25.2	23.8	24.2	95	96	75-125	2	20	
Thallium	mg/kg	ND	49.9	50.5	50.0	51.1	98	99	75-125	2	20	
Zinc	mg/kg	15.6	49.9	50.5	61.7	64.0	92	96	75-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 523126 Analysis Method: 6010C Met
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved
Associated Lab Samples: 10420484009, 10420484014, 10420484017

METHOD BLANK: 2839994 Matrix: Water
Associated Lab Samples: 10420484009, 10420484014, 10420484017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	20.0	3.1	02/16/18 16:56	
Beryllium, Dissolved	ug/L	ND	5.0	0.11	02/16/18 16:56	
Cadmium, Dissolved	ug/L	ND	3.0	0.46	02/16/18 16:56	
Chromium, Dissolved	ug/L	ND	10.0	0.50	02/16/18 16:56	
Copper, Dissolved	ug/L	ND	10.0	0.83	02/16/18 16:56	
Lead, Dissolved	ug/L	ND	10.0	3.0	02/16/18 16:56	
Nickel, Dissolved	ug/L	ND	20.0	1.1	02/16/18 16:56	
Silver, Dissolved	ug/L	ND	10.0	0.27	02/16/18 16:56	
Thallium, Dissolved	ug/L	ND	20.0	4.8	02/16/18 16:56	
Zinc, Dissolved	ug/L	ND	20.0	1.8	02/16/18 16:56	

LABORATORY CONTROL SAMPLE: 2839995

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	1000	1020	102	80-120	
Beryllium, Dissolved	ug/L	1000	1040	104	80-120	
Cadmium, Dissolved	ug/L	1000	1010	101	80-120	
Chromium, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	987	99	80-120	
Lead, Dissolved	ug/L	1000	1010	101	80-120	
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Silver, Dissolved	ug/L	500	496	99	80-120	
Thallium, Dissolved	ug/L	1000	1030	103	80-120	
Zinc, Dissolved	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2839996 2839997

Parameter	Units	10420484009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony, Dissolved	ug/L	3.3J	1000	1000	1080	1070	107	107	75-125	0	20	
Beryllium, Dissolved	ug/L	0.15J	1000	1000	1110	1090	111	109	75-125	2	20	
Cadmium, Dissolved	ug/L	0.72J	1000	1000	1060	1040	106	104	75-125	2	20	
Chromium, Dissolved	ug/L	ND	1000	1000	996	976	100	98	75-125	2	20	
Copper, Dissolved	ug/L	3.5J	1000	1000	1070	1050	106	105	75-125	2	20	
Lead, Dissolved	ug/L	ND	1000	1000	964	945	96	94	75-125	2	20	
Nickel, Dissolved	ug/L	39.0	1000	1000	1010	987	97	95	75-125	2	20	
Silver, Dissolved	ug/L	0.55J	500	500	538	529	107	106	75-125	2	20	
Thallium, Dissolved	ug/L	8.6J	1000	1000	949	931	94	92	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2839996 2839997

Parameter	Units	10420484009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Zinc, Dissolved	ug/L	3.8J	1000	1000	940	920	94	92	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 522976 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10420484001, 10420484002, 10420484003, 10420484004, 10420484005, 10420484006, 10420484007, 10420484008, 10420484010, 10420484011, 10420484012, 10420484013, 10420484015, 10420484016, 10420484018, 10420484019, 10420484020, 10420484021, 10420484022, 10420484023

METHOD BLANK: 2838987 Matrix: Solid
Associated Lab Samples: 10420484001, 10420484002, 10420484003, 10420484004, 10420484005, 10420484006, 10420484007, 10420484008, 10420484010, 10420484011, 10420484012, 10420484013, 10420484015, 10420484016, 10420484018, 10420484019, 10420484020, 10420484021, 10420484022, 10420484023

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.48	0.22	02/17/18 03:11	
Selenium	mg/kg	ND	0.48	0.24	02/17/18 03:11	

LABORATORY CONTROL SAMPLE: 2838988

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	45.9	45.9	100	80-120	
Selenium	mg/kg	45.9	45.8	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2838989 2838990

Parameter	Units	10420484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	1.7	49.5	52.4	50.5	54.4	99	101	75-125	7	20	
Selenium	mg/kg	0.38J	49.5	52.4	49.2	51.3	99	97	75-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 523127 Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 Analysis Description: 6020A Water Dissolved UPD4
Associated Lab Samples: 10420484009, 10420484014, 10420484017

METHOD BLANK: 2839998 Matrix: Water
Associated Lab Samples: 10420484009, 10420484014, 10420484017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	ND	0.50	0.21	02/19/18 22:21	
Selenium, Dissolved	ug/L	ND	0.50	0.17	02/19/18 22:21	

LABORATORY CONTROL SAMPLE: 2839999

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	100	107	107	80-120	
Selenium, Dissolved	ug/L	100	108	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2840000 2840001

Parameter	Units	10420484014 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	3.2	100	100	109	111	106	108	75-125	2	20	
Selenium, Dissolved	ug/L	0.48J	100	100	106	104	106	103	75-125	2	20	

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 523145 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10420484001, 10420484002, 10420484003, 10420484004, 10420484005, 10420484006, 10420484007, 10420484008, 10420484010, 10420484011, 10420484012, 10420484013, 10420484015, 10420484016, 10420484018

SAMPLE DUPLICATE: 2840052

Parameter	Units	60263379007 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	2.3	2.2	4	30	

SAMPLE DUPLICATE: 2840053

Parameter	Units	10420484018 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.8	10.6	2	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

QC Batch: 523159 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10420484019, 10420484020, 10420484021, 10420484022, 10420484023

SAMPLE DUPLICATE: 2840091

Parameter	Units	10420484019 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.7	10.7	0	30	

SAMPLE DUPLICATE: 2840092

Parameter	Units	10419819001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	60.7	60.5	0	30	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

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.

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.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10420484001	**DP-22 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484002	**DP-22 (9-10)**	EPA 3050	522862	EPA 6010C	523036
10420484003	**DP-21 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484004	**DP-21 (9-10)**	EPA 3050	522862	EPA 6010C	523036
10420484005	**DP-23 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484006	**DP-23 (9-10)**	EPA 3050	522862	EPA 6010C	523036
10420484007	**DP-24 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484008	**DP-24 (20-22)**	EPA 3050	522862	EPA 6010C	523036
10420484010	**DP-27 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484011	**DP-27 (20-21)**	EPA 3050	522862	EPA 6010C	523036
10420484012	**DP-26 (3-4)**	EPA 3050	522862	EPA 6010C	523036
10420484013	**DP-26 (14-16)**	EPA 3050	522862	EPA 6010C	523036
10420484015	**DP-25 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484016	**DP-25 (16-17)**	EPA 3050	522862	EPA 6010C	523036
10420484018	**DP-18 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484019	**DP-18 (9-10)**	EPA 3050	522862	EPA 6010C	523036
10420484020	**DP-19 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484021	**DP-19 (9-10)**	EPA 3050	522862	EPA 6010C	523036
10420484022	**DP-20 (2-3)**	EPA 3050	522862	EPA 6010C	523036
10420484023	**DP-20 (9-10)**	EPA 3050	522862	EPA 6010C	523036
10420484009	**DP-24**	EPA 3010	523126	6010C Met	523272
10420484014	**DP-26**	EPA 3010	523126	6010C Met	523272
10420484017	**DP-25**	EPA 3010	523126	6010C Met	523272
10420484001	**DP-22 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484002	**DP-22 (9-10)**	EPA 3050	522976	EPA 6020A	523275
10420484003	**DP-21 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484004	**DP-21 (9-10)**	EPA 3050	522976	EPA 6020A	523275
10420484005	**DP-23 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484006	**DP-23 (9-10)**	EPA 3050	522976	EPA 6020A	523275
10420484007	**DP-24 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484008	**DP-24 (20-22)**	EPA 3050	522976	EPA 6020A	523275
10420484010	**DP-27 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484011	**DP-27 (20-21)**	EPA 3050	522976	EPA 6020A	523275
10420484012	**DP-26 (3-4)**	EPA 3050	522976	EPA 6020A	523275
10420484013	**DP-26 (14-16)**	EPA 3050	522976	EPA 6020A	523275
10420484015	**DP-25 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484016	**DP-25 (16-17)**	EPA 3050	522976	EPA 6020A	523275
10420484018	**DP-18 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484019	**DP-18 (9-10)**	EPA 3050	522976	EPA 6020A	523275
10420484020	**DP-19 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484021	**DP-19 (9-10)**	EPA 3050	522976	EPA 6020A	523275
10420484022	**DP-20 (2-3)**	EPA 3050	522976	EPA 6020A	523275
10420484023	**DP-20 (9-10)**	EPA 3050	522976	EPA 6020A	523275
10420484009	**DP-24**	EPA 3020	523127	EPA 6020A	523471
10420484014	**DP-26**	EPA 3020	523127	EPA 6020A	523471
10420484017	**DP-25**	EPA 3020	523127	EPA 6020A	523471
10420484009	**DP-24**	EPA 7470A	522980	EPA 7470A	523253

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420484

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10420484014	**DP-26**	EPA 7470A	522980	EPA 7470A	523253
10420484017	**DP-25**	EPA 7470A	522980	EPA 7470A	523253
10420484001	**DP-22 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484002	**DP-22 (9-10)**	EPA 7471B	522877	EPA 7471B	523017
10420484003	**DP-21 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484004	**DP-21 (9-10)**	EPA 7471B	522877	EPA 7471B	523017
10420484005	**DP-23 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484006	**DP-23 (9-10)**	EPA 7471B	522877	EPA 7471B	523017
10420484007	**DP-24 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484008	**DP-24 (20-22)**	EPA 7471B	522877	EPA 7471B	523017
10420484010	**DP-27 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484011	**DP-27 (20-21)**	EPA 7471B	522877	EPA 7471B	523017
10420484012	**DP-26 (3-4)**	EPA 7471B	522877	EPA 7471B	523017
10420484013	**DP-26 (14-16)**	EPA 7471B	522877	EPA 7471B	523017
10420484015	**DP-25 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484016	**DP-25 (16-17)**	EPA 7471B	522877	EPA 7471B	523017
10420484018	**DP-18 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484019	**DP-18 (9-10)**	EPA 7471B	522877	EPA 7471B	523017
10420484020	**DP-19 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484021	**DP-19 (9-10)**	EPA 7471B	522877	EPA 7471B	523017
10420484022	**DP-20 (2-3)**	EPA 7471B	522877	EPA 7471B	523017
10420484023	**DP-20 (9-10)**	EPA 7471B	522877	EPA 7471B	523017
10420484001	**DP-22 (2-3)**	ASTM D2974	523145		
10420484002	**DP-22 (9-10)**	ASTM D2974	523145		
10420484003	**DP-21 (2-3)**	ASTM D2974	523145		
10420484004	**DP-21 (9-10)**	ASTM D2974	523145		
10420484005	**DP-23 (2-3)**	ASTM D2974	523145		
10420484006	**DP-23 (9-10)**	ASTM D2974	523145		
10420484007	**DP-24 (2-3)**	ASTM D2974	523145		
10420484008	**DP-24 (20-22)**	ASTM D2974	523145		
10420484010	**DP-27 (2-3)**	ASTM D2974	523145		
10420484011	**DP-27 (20-21)**	ASTM D2974	523145		
10420484012	**DP-26 (3-4)**	ASTM D2974	523145		
10420484013	**DP-26 (14-16)**	ASTM D2974	523145		
10420484015	**DP-25 (2-3)**	ASTM D2974	523145		
10420484016	**DP-25 (16-17)**	ASTM D2974	523145		
10420484018	**DP-18 (2-3)**	ASTM D2974	523145		
10420484019	**DP-18 (9-10)**	ASTM D2974	523159		
10420484020	**DP-19 (2-3)**	ASTM D2974	523159		
10420484021	**DP-19 (9-10)**	ASTM D2974	523159		
10420484022	**DP-20 (2-3)**	ASTM D2974	523159		
10420484023	**DP-20 (9-10)**	ASTM D2974	523159		

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / WO# : 10420484

The Chain-of-Custody is a LEGAL DOCUM

10420484

1 of 2

2258736

Section A Required Client Information:

Company: WSP
Address: 123 North 3rd St. Ste 501
Minneapolis, MN 55401
Email To: Paula Berger
Phone: 612-343-0516 Fax:
Requested Due Date/TAT: MnDOT 5-day

Section B Required Project Information:

Report To: Paula Berger
Copy To: Kevin Walter
Purchase Order No.:
Project Name: I-35W MN River Bridge
Project Number: 31401059.001

Section C Invoice Information:

Attention: Accounts Payable
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Bob Michels
Pace Profile #: 27017

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: Priority Pollutant Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	DP-22 (2-3)	SL	G			2/10	1400		1	X								X		001
2	DP-22 (9-10)	SL	G			2/10	1405		1	X								X		002
3	DP-21 (2-3)	SL	G			2/10	1425		1	X								X		003
4	DP-21 (9-10)	SL	G			2/10	1430		1	X								X		004
5	DP-23 (2-3)	SL	G			2/10	1530		1	X								X		005
6	DP-23 (9-10)	SL	G			2/10	1535		1	X								X		006
7	DP-24 (2-3)	SL	G			2/11	0910		1	X								X		007
8	DP-24 (20-22)	SL	G			2/11	0930		1	X								X		008
9	DP-24	WT	G			2/11	1000		1			X						X		009
10	[illegible]	[illegible]	G			2/11	1105		1			X						X		[illegible]
11	DP-27 (2-3)	SL	G			2/11	1515		1	X								X		010
12	DP-27 (20-21)	SL	G			2/11	1550		1	X								X		011

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Run As & Se by ICP-MS	WSP	2/13/18	1040	Pace	2/13/18	1040	0.2	Y	N	T
DP-24 Field-Filtered										

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kevin Walter

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 02/13/18

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

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

2258733

Section A Required Client Information:

Company: WSP
Address: 123 North 3rd St Ste 507
Minneapolis, MN 55401
Email To: Paula.Berger
Phone: 612-343-0840 Fax:
Requested Due Date/TAT: MnDOT 5-day

Section B Required Project Information:

Report To: Paula Berger
Copy To: Kevin Walter
Purchase Order No.:
Project Name: I-35W MN River Bridge
Project Number: 31401059.001

Section C Invoice Information:

Attention: Accounts Payable
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: Bob Michels
Pace Profile #: 27017

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: Priority Pollutant Metals	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	DP-26 (3-4)	SL	G			2/11	1640		1	X								X		012
2	DP-26 (14-16)	SL	G			2/11	1655		1	X								X		013
3	DP-26	WT	G			2/11	1705		1			X						X		014
4	DP-25 (2-3)	SL	G			2/12	0830		1	X								X		015
5	DP-25 (16-17)	SL	G			2/12	0855		1	X								X		016
6	DP-25	WT	G			2/12	0910		1			X						X		017
7	DP-18 (2-3)	SL	G			2/12	1050		1	X								X		018
8	DP-18 (9-10)	SL	G			2/12	1055		1	X								X		019
9	DP-19 (2-3)	SL	G			2/12	1230		1	X								X		020
10	DP-19 (9-10)	SL	G			2/12	1250		1	X								X		021
11	DP-20 (2-3)	SL	G			2/12	1330		1	X								X		022
12	DP-20 (9-10)	SL	G			2/12	1345		1	X								X		023

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Run As & Se with ICP-MS	WSP	2/13/18	1040	FOL Pace	2/13/18	1040	6.2	Y	N	Y
Water samples DP-26 and DP25 field-filtered										

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kevin Walter
SIGNATURE of SAMPLER:
DATE Signed (MM/DD/YY): 02/13/18

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

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 14Dec2017 Page 1 of 2
	Document No.: **F-MN-L-213-rev.22**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: WSP

Project #: **WO#: 10420484**

PM: BM2 Due Date: 02/20/18

CLIENT: WSP E & E

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

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

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

Thermometer Used: ☑ 151401163 ☐ G87A9155100842 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 0.4 **Cooler Temp Corrected (°C):** 0.2 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** ME 2/13/18

USDA Regulated Soil (☐ N/A, water sample)

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?	☑ 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?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10. ME 2/13/18
Filtered Volume Received for Dissolved Tests?	☑ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -includes Date/Time/ID/Analysis Matrix: wt, SL	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked? All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	☑ Yes ☑ Yes ☐ Yes	☐ No ☐ No ☐ No	☐ N/A ☐ N/A ☑ N/A	13. ☑ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N Sample # 9,12,18 1/1 Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
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: BL VC **Date:** 2/14/18

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).

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-106396-1
TestAmerica Sample Delivery Group: 31401059.001
Client Project/Site: MnDOT I-35W Minnesota River Bridge

For:
WSP USA Inc.
123 N 3rd Street
Suite 507
Minneapolis, Minnesota 55401

Attn: Ms. Paula Berger

Authorized for release by:
2/28/2018 11:10:36 AM

Zach Bindert, Project Manager I
(319)277-2401
zach.bindert@testamericainc.com

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Job ID: 280-106396-1

Laboratory: TestAmerica Denver

Narrative

Job Narrative
280-106396-1

Comments
No additional comments.

Receipt
The samples were received on 2/14/2018 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

LCMS
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 3535: The following samples: DP-24 (280-106396-1), DP-28 (280-106396-2), DP-27 (280-106396-3), DP-26 (280-106396-4) and DP-25 (280-106396-5) were decanted prior to preparation as there was about an inch sediment layer in the client sample containers

Batch 405741
3535_PFC

Batch 406017
3535_FOSA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Client Sample ID: DP-24 — Lab Sample ID: 280-106396-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutyric acid	0.0380		0.0200		ug/L	1		DV-LC-0012	Total/NA

Client Sample ID: DP-28 — Lab Sample ID: 280-106396-2

No Detections.

Client Sample ID: DP-27 — Lab Sample ID: 280-106396-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutyric acid	0.0509		0.0206		ug/L	1		DV-LC-0012	Total/NA

Client Sample ID: DP-26 — Lab Sample ID: 280-106396-4

No Detections.

Client Sample ID: DP-25 — Lab Sample ID: 280-106396-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutyric acid	0.0361		0.0223		ug/L	1		DV-LC-0012	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Method	Method Description	Protocol	Laboratory
DV-LC-0012	Fluorinated Alkyl Substances	TAL-DEN	TAL DEN
PFC -FOSA	FOSA in Water (LC/MS/MS)	TAL-DEN	TAL DEN

Protocol References:

TAL-DEN = TestAmerica Laboratories, Denver, Facility Standard Operating Procedure.

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-106396-1	DP-24	Ground Water	02/11/18 10:00	02/14/18 09:40
280-106396-2	DP-28	Ground Water	02/11/18 14:05	02/14/18 09:40
280-106396-3	DP-27	Ground Water	02/11/18 16:00	02/14/18 09:40
280-106396-4	DP-26	Ground Water	02/11/18 17:05	02/14/18 09:40
280-106396-5	DP-25	Ground Water	02/11/18 09:10	02/14/18 09:40

Method: DV-LC-0012 - Fluorinated Alkyl Substances

Client Sample ID: DP-24
Date Collected: 02/11/18 10:00
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-1
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutane Sulfonate	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorobutyric acid	**0.0380**		0.0200		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorodecane Sulfonate	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorodecanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorododecanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluoroheptanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorohexane Sulfonate	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorohexanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorononanoic acid	<0.0400		0.0400		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorooctane sulfonic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorooctanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluoropentanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorotetradecanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluorotridecanoic acid	<0.0400		0.0400		ug/L		02/21/18 21:02	02/22/18 19:08	1
Perfluoroundecanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 19:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*94*		*60 - 155*	*02/21/18 21:02*	*02/22/18 19:08*	*1*
13C8 PFOS	*95*		*45 - 130*	*02/21/18 21:02*	*02/22/18 19:08*	*1*

Client Sample ID: DP-28
Date Collected: 02/11/18 14:05
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-2
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutane Sulfonate	<0.0192		0.0192		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorobutyric acid	<0.0192		0.0192		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorodecane Sulfonate	<0.0192		0.0192		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorodecanoic acid	<0.0192		0.0192		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorododecanoic acid	<0.0289		0.0289		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluoroheptanoic acid	<0.0289		0.0289		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorohexane Sulfonate	<0.0289		0.0289		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorohexanoic acid	<0.0192		0.0192		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorononanoic acid	<0.0385		0.0385		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorooctane sulfonic acid	<0.0289		0.0289		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorooctanoic acid	<0.0192		0.0192		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluoropentanoic acid	<0.0289		0.0289		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorotetradecanoic acid	<0.0289		0.0289		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluorotridecanoic acid	<0.0385		0.0385		ug/L		02/21/18 21:02	02/22/18 18:43	1
Perfluoroundecanoic acid	<0.0192		0.0192		ug/L		02/21/18 21:02	02/22/18 18:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*92*		*60 - 155*	*02/21/18 21:02*	*02/22/18 18:43*	*1*
13C8 PFOS	*92*		*45 - 130*	*02/21/18 21:02*	*02/22/18 18:43*	*1*

Client Sample ID: DP-27
Date Collected: 02/11/18 16:00
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-3
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutane Sulfonate	<0.0206		0.0206		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorobutyric acid	**0.0509**		0.0206		ug/L		02/21/18 21:02	02/22/18 18:31	1

Method: DV-LC-0012 - Fluorinated Alkyl Substances (Continued)

Client Sample ID: DP-27
Date Collected: 02/11/18 16:00
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-3
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecane Sulfonate	<0.0206		0.0206		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorodecanoic acid	<0.0206		0.0206		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorododecanoic acid	<0.0309		0.0309		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluoroheptanoic acid	<0.0309		0.0309		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorohexane Sulfonate	<0.0309		0.0309		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorohexanoic acid	<0.0206		0.0206		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorononanoic acid	<0.0412		0.0412		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorooctane sulfonic acid	<0.0309		0.0309		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorooctanoic acid	<0.0206		0.0206		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluoropentanoic acid	<0.0309		0.0309		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorotetradecanoic acid	<0.0309		0.0309		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluorotridecanoic acid	<0.0412		0.0412		ug/L		02/21/18 21:02	02/22/18 18:31	1
Perfluoroundecanoic acid	<0.0206		0.0206		ug/L		02/21/18 21:02	02/22/18 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*91*		*60 - 155*	*02/21/18 21:02*	*02/22/18 18:31*	*1*
13C8 PFOS	*100*		*45 - 130*	*02/21/18 21:02*	*02/22/18 18:31*	*1*

Client Sample ID: DP-26
Date Collected: 02/11/18 17:05
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-4
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutane Sulfonate	<0.0229		0.0229		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorobutyric acid	<0.0229		0.0229		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorodecane Sulfonate	<0.0229		0.0229		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorodecanoic acid	<0.0229		0.0229		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorododecanoic acid	<0.0343		0.0343		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluoroheptanoic acid	<0.0343		0.0343		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorohexane Sulfonate	<0.0343		0.0343		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorohexanoic acid	<0.0229		0.0229		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorononanoic acid	<0.0458		0.0458		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorooctane sulfonic acid	<0.0343		0.0343		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorooctanoic acid	<0.0229		0.0229		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluoropentanoic acid	<0.0343		0.0343		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorotetradecanoic acid	<0.0343		0.0343		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluorotridecanoic acid	<0.0458		0.0458		ug/L		02/21/18 21:02	02/22/18 18:19	1
Perfluoroundecanoic acid	<0.0229		0.0229		ug/L		02/21/18 21:02	02/22/18 18:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*95*		*60 - 155*	*02/21/18 21:02*	*02/22/18 18:19*	*1*
13C8 PFOS	*94*		*45 - 130*	*02/21/18 21:02*	*02/22/18 18:19*	*1*

Client Sample ID: DP-25
Date Collected: 02/11/18 09:10
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-5
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutane Sulfonate	<0.0223		0.0223		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorobutyric acid	**0.0361**		0.0223		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorodecane Sulfonate	<0.0223		0.0223		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorodecanoic acid	<0.0223		0.0223		ug/L		02/21/18 21:02	02/22/18 18:06	1

Method: DV-LC-0012 - Fluorinated Alkyl Substances (Continued)

Client Sample ID: DP-25
Date Collected: 02/11/18 09:10
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-5
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid	<0.0335		0.0335		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluoroheptanoic acid	<0.0335		0.0335		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorohexane Sulfonate	<0.0335		0.0335		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorohexanoic acid	<0.0223		0.0223		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorononanoic acid	<0.0446		0.0446		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorooctane sulfonic acid	<0.0335		0.0335		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorooctanoic acid	<0.0223		0.0223		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluoropentanoic acid	<0.0335		0.0335		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorotetradecanoic acid	<0.0335		0.0335		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluorotridecanoic acid	<0.0446		0.0446		ug/L		02/21/18 21:02	02/22/18 18:06	1
Perfluoroundecanoic acid	<0.0223		0.0223		ug/L		02/21/18 21:02	02/22/18 18:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*98*		*60 - 155*	*02/21/18 21:02*	*02/22/18 18:06*	*1*
13C8 PFOS	*92*		*45 - 130*	*02/21/18 21:02*	*02/22/18 18:06*	*1*

Method: PFC -FOSA - FOSA in Water (LC/MS/MS)

Client Sample ID: DP-24
Date Collected: 02/11/18 10:00
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-1
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide	<0.0524		0.0524		ug/L		02/24/18 20:02	02/26/18 23:03	1

Client Sample ID: DP-28
Date Collected: 02/11/18 14:05
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-2
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide	<0.0513		0.0513		ug/L		02/24/18 20:02	02/26/18 23:16	1

Client Sample ID: DP-27
Date Collected: 02/11/18 16:00
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-3
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide	<0.0486		0.0486		ug/L		02/24/18 20:02	02/26/18 23:28	1

Client Sample ID: DP-26
Date Collected: 02/11/18 17:05
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-4
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide	<0.0597		0.0597		ug/L		02/24/18 20:02	02/26/18 23:53	1

Client Sample ID: DP-25
Date Collected: 02/11/18 09:10
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-5
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide	<0.0611		0.0611		ug/L		02/24/18 20:02	02/27/18 00:05	1

Surrogate Summary

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Method: DV-LC-0012 - Fluorinated Alkyl Substances

Matrix: Ground Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		PFOA	PFOS
Lab Sample ID	Client Sample ID	(60-155)	(45-130)
280-106396-1	DP-24	94	95
280-106396-2	DP-28	92	92
280-106396-3	DP-27	91	100
280-106396-4	DP-26	95	94
280-106396-5	DP-25	98	92

Surrogate Legend

PFOA = 13C8 PFOA

PFOS = 13C8 PFOS

Method: DV-LC-0012 - Fluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		PFOA	PFOS
Lab Sample ID	Client Sample ID	(60-155)	(45-130)
DLCK 280-401950/14	Lab Control Sample	109	104
LCS 280-405741/2-A	Lab Control Sample	92	98
MB 280-405741/1-A	Method Blank	96	97

Surrogate Legend

PFOA = 13C8 PFOA

PFOS = 13C8 PFOS

Method: DV-LC-0012 - Fluorinated Alkyl Substances

Lab Sample ID: DLCK 280-401950/14
Matrix: Water
Analysis Batch: 401950

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	DLCK Result	DLCK Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutane Sulfonate	0.442	0.4763		ug/L		108	70 - 130
Perfluorobutyric acid	0.490	0.4896		ug/L		100	70 - 130
Perfluorodecane Sulfonate	0.482	0.5189		ug/L		108	70 - 130
Perfluorodecanoic acid	0.490	0.5265		ug/L		107	70 - 130
Perfluorododecanoic acid	0.490	0.3950		ug/L		81	70 - 130
Perfluoroheptanoic acid	0.490	0.5458		ug/L		111	70 - 130
Perfluorohexane Sulfonate	0.455	0.4498		ug/L		99	70 - 130
Perfluorohexanoic acid	0.490	0.5412		ug/L		110	70 - 130
Perfluorononanoic acid	0.490	0.5982		ug/L		122	70 - 130
Perfluorooctane sulfonic acid	0.464	0.4629		ug/L		100	70 - 130
Perfluorooctanoic acid	0.490	0.5148		ug/L		105	70 - 130
Perfluoropentanoic acid	0.490	0.4509		ug/L		92	70 - 130
Perfluorotetradecanoic acid	0.490	0.4679		ug/L		95	70 - 130
Perfluorotridecanoic acid	0.490	0.4727		ug/L		96	70 - 130
Perfluoroundecanoic acid	0.490	0.5025		ug/L		103	70 - 130

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C8 PFOA	*109*		*60 - 155*
13C8 PFOS	*104*		*45 - 130*

Lab Sample ID: MB 280-405741/1-A
Matrix: Water
Analysis Batch: 405923

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 405741

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutane Sulfonate	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorobutyric acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorodecane Sulfonate	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorodecanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorododecanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluoroheptanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorohexane Sulfonate	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorohexanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorononanoic acid	<0.0400		0.0400		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorooctane sulfonic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorooctanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluoropentanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorotetradecanoic acid	<0.0300		0.0300		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluorotridecanoic acid	<0.0400		0.0400		ug/L		02/21/18 21:02	02/22/18 16:52	1
Perfluoroundecanoic acid	<0.0200		0.0200		ug/L		02/21/18 21:02	02/22/18 16:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*96*		*60 - 155*	*02/21/18 21:02*	*02/22/18 16:52*	*1*
13C8 PFOS	*97*		*45 - 130*	*02/21/18 21:02*	*02/22/18 16:52*	*1*

Method: DV-LC-0012 - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 280-405741/2-A
Matrix: Water
Analysis Batch: 405923

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 405741

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutane Sulfonate	0.177	0.2098		ug/L		119	70 - 134
Perfluorobutyric acid	0.196	0.2034		ug/L		104	70 - 130
Perfluorodecane Sulfonate	0.193	0.1470		ug/L		76	34 - 130
Perfluorodecanoic acid	0.196	0.2068		ug/L		106	70 - 130
Perfluorododecanoic acid	0.196	0.2087		ug/L		106	66 - 133
Perfluoroheptanoic acid	0.196	0.2322		ug/L		118	70 - 135
Perfluorohexane Sulfonate	0.182	0.2112		ug/L		116	70 - 132
Perfluorohexanoic acid	0.196	0.2174		ug/L		111	70 - 130
Perfluorononanoic acid	0.196	0.1901		ug/L		97	69 - 143
Perfluorooctane sulfonic acid	0.186	0.2103		ug/L		113	70 - 130
Perfluorooctanoic acid	0.196	0.2321		ug/L		118	70 - 130
Perfluoropentanoic acid	0.196	0.2111		ug/L		108	66 - 134
Perfluorotetradecanoic acid	0.196	0.2555		ug/L		130	23 - 149
Perfluorotridecanoic acid	0.196	0.2344		ug/L		120	26 - 136
Perfluoroundecanoic acid	0.196	0.2110		ug/L		108	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 PFOA	*92*		*60 - 155*
13C8 PFOS	*98*		*45 - 130*

Method: PFC -FOSA - FOSA in Water (LC/MS/MS)

Lab Sample ID: DLCK 280-401100/14
Matrix: Water
Analysis Batch: 401100

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	DLCK Result	DLCK Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctane Sulfonamide	0.500	<2.50		ug/L		100	70 - 130

Lab Sample ID: MB 280-406017/1-A
Matrix: Water
Analysis Batch: 406235

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 406017

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide	<0.0500		0.0500		ug/L		02/24/18 20:02	02/26/18 21:36	1

Lab Sample ID: LCS 280-406017/2-A
Matrix: Water
Analysis Batch: 406235

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 406017

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctane Sulfonamide	0.200	0.1897		ug/L		95	57 - 133

LCMS

Analysis Batch: 401100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-401100/14	Lab Control Sample	Total/NA	Water	PFC -FOSA	

Analysis Batch: 401950

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-401950/14	Lab Control Sample	Total/NA	Water	DV-LC-0012	

Prep Batch: 405741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-106396-1	DP-24	Total/NA	Ground Water	3535	
280-106396-2	DP-28	Total/NA	Ground Water	3535	
280-106396-3	DP-27	Total/NA	Ground Water	3535	
280-106396-4	DP-26	Total/NA	Ground Water	3535	
280-106396-5	DP-25	Total/NA	Ground Water	3535	
MB 280-405741/1-A	Method Blank	Total/NA	Water	3535	
LCS 280-405741/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 405923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-106396-1	DP-24	Total/NA	Ground Water	DV-LC-0012	405741
280-106396-2	DP-28	Total/NA	Ground Water	DV-LC-0012	405741
280-106396-3	DP-27	Total/NA	Ground Water	DV-LC-0012	405741
280-106396-4	DP-26	Total/NA	Ground Water	DV-LC-0012	405741
280-106396-5	DP-25	Total/NA	Ground Water	DV-LC-0012	405741
MB 280-405741/1-A	Method Blank	Total/NA	Water	DV-LC-0012	405741
LCS 280-405741/2-A	Lab Control Sample	Total/NA	Water	DV-LC-0012	405741

Prep Batch: 406017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-106396-1	DP-24	Total/NA	Ground Water	3535	
280-106396-2	DP-28	Total/NA	Ground Water	3535	
280-106396-3	DP-27	Total/NA	Ground Water	3535	
280-106396-4	DP-26	Total/NA	Ground Water	3535	
280-106396-5	DP-25	Total/NA	Ground Water	3535	
MB 280-406017/1-A	Method Blank	Total/NA	Water	3535	
LCS 280-406017/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 406235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-106396-1	DP-24	Total/NA	Ground Water	PFC -FOSA	406017
280-106396-2	DP-28	Total/NA	Ground Water	PFC -FOSA	406017
280-106396-3	DP-27	Total/NA	Ground Water	PFC -FOSA	406017
280-106396-4	DP-26	Total/NA	Ground Water	PFC -FOSA	406017
280-106396-5	DP-25	Total/NA	Ground Water	PFC -FOSA	406017
MB 280-406017/1-A	Method Blank	Total/NA	Water	PFC -FOSA	406017
LCS 280-406017/2-A	Lab Control Sample	Total/NA	Water	PFC -FOSA	406017

Lab Chronicle

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Client Sample ID: DP-24
Date Collected: 02/11/18 10:00
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-1
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			250.07 mL	5 mL	405741	02/21/18 21:02	CDC	TAL DEN
Total/NA	Analysis	DV-LC-0012		1			405923	02/22/18 19:08	HKF	TAL DEN
Total/NA	Prep	3535			238.4 mL	5 mL	406017	02/24/18 20:02	CDC	TAL DEN
Total/NA	Analysis	PFC -FOSA		1			406235	02/26/18 23:03	HKF	TAL DEN

Client Sample ID: DP-28
Date Collected: 02/11/18 14:05
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-2
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			259.95 mL	5 mL	405741	02/21/18 21:02	CDC	TAL DEN
Total/NA	Analysis	DV-LC-0012		1			405923	02/22/18 18:43	HKF	TAL DEN
Total/NA	Prep	3535			243.6 mL	5 mL	406017	02/24/18 20:02	CDC	TAL DEN
Total/NA	Analysis	PFC -FOSA		1			406235	02/26/18 23:16	HKF	TAL DEN

Client Sample ID: DP-27
Date Collected: 02/11/18 16:00
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-3
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			242.50 mL	5 mL	405741	02/21/18 21:02	CDC	TAL DEN
Total/NA	Analysis	DV-LC-0012		1			405923	02/22/18 18:31	HKF	TAL DEN
Total/NA	Prep	3535			257.2 mL	5 mL	406017	02/24/18 20:02	CDC	TAL DEN
Total/NA	Analysis	PFC -FOSA		1			406235	02/26/18 23:28	HKF	TAL DEN

Client Sample ID: DP-26
Date Collected: 02/11/18 17:05
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-4
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			218.47 mL	5 mL	405741	02/21/18 21:02	CDC	TAL DEN
Total/NA	Analysis	DV-LC-0012		1			405923	02/22/18 18:19	HKF	TAL DEN
Total/NA	Prep	3535			209.5 mL	5 mL	406017	02/24/18 20:02	CDC	TAL DEN
Total/NA	Analysis	PFC -FOSA		1			406235	02/26/18 23:53	HKF	TAL DEN

Client Sample ID: DP-25
Date Collected: 02/11/18 09:10
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-5
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			224.08 mL	5 mL	405741	02/21/18 21:02	CDC	TAL DEN
Total/NA	Analysis	DV-LC-0012		1			405923	02/22/18 18:06	HKF	TAL DEN
Total/NA	Prep	3535			204.6 mL	5 mL	406017	02/24/18 20:02	CDC	TAL DEN

Lab Chronicle

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Client Sample ID: DP-25

Date Collected: 02/11/18 09:10
Date Received: 02/14/18 09:40

Lab Sample ID: 280-106396-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	PFC -FOSA		1			406235	02/27/18 00:05	HKF	TAL DEN

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: WSP USA Inc.
Project/Site: MnDOT I-35W Minnesota River Bridge

TestAmerica Job ID: 280-106396-1
SDG: 31401059.001

Laboratory: TestAmerica Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Minnesota	NELAP	5	8-999-405	12-31-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
DV-LC-0012	3535	Ground Water	Perfluorodecane Sulfonate
DV-LC-0012	3535	Ground Water	Perfluorotridecanoic acid
PFC -FOSA	3535	Ground Water	Perfluorooctane Sulfonamide

Laboratory: TestAmerica Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Minnesota	NELAP	5	019-999-319	12-31-18

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613

Phone 319-277-2401 or 800-750-2401
Fax 319-277-2425

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring _____

Client Name: WSP
Client #: _____
Address: 123 North 3rd st Ste. 507
City/State/Zip Code: Minneapolis, MN 55401
Project Manager: Paula Berger
Email Address: Paula.Berger@wsp.com
Telephone Number: 612-343-0510
Fax: _____
Sampler Name: (Print Name) Kevin Walter
Sampler Signature:

Project Name: MnDOT I-35W MN River Bridge
Project #: 31401059.001
Site/Location ID: _____
State: MN
Report To: Paula Berger, Kevin Walter
Invoice To: Accounts Payable
Quote #: _____
PO#: _____

TAT
X Standard MnDOT 5-day or closest possible
___ Rush (surcharges may apply)
Date Needed: _____
Fax Results: Y N
Email Results: (Y) N

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix (SL - Sludge, DW - Drinking Water, GW - Groundwater, S - Soil/Solid, WW - Wastewater, Specify, Other)	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: PFC FOSA	PFC
DP-24	2/1/18	1000	G	N	GW						4		X	X
DP-28	2/11/18	1405									4		X	X
DP-27	2/11/18	1600									4		X	X
DP-26	2/11/18	1705									4		X	X
DP-25	2/12/18	0910									4		X	X

280-106396 Chain of Custody

QC Deliverables
___ None
___ Level 2 (Batch QC)
___ Level 3
___ Level 4
Other: _____

REMARKS

Special Instructions:

LABORATORY COMMENTS:

	Date	Time		Date	Time
Relinquished By:	2/13/18	10:20	Received By: Barb Kutter	2/13/18	10:20
Relinquished By: Barb Kutter	2/13/18	1700	Received By:		
Relinquished By:			Received By:		

TAL-0033 (0708)

Page 1 of 1

Login Sample Receipt Checklist

Client: WSP USA Inc.

Job Number: 280-106396-1
SDG Number: 31401059.001

Login Number: 106396
List Number: 1
Creator: True, Joshua A

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX

E SOIL GAS SAMPLE LABORATORY ANALYTICAL REPORTS

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

March 02, 2018

Ms. Paula Berger
WSP Environment and Energy
123 North Third Street
Suite 808
Minneapolis, MN 55401

RE: Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Dear Ms. Berger:
Enclosed are the analytical results for sample(s) received by the laboratory on February 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

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

CERTIFICATIONS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
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 #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
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 NwTPH 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
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

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

SAMPLE SUMMARY

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10420487001	**SG-16**	Air	02/10/18 08:47	02/13/18 11:05
10420487002	**SG-15**	Air	02/10/18 09:23	02/13/18 11:05
10420487003	**SG-1**	Air	02/10/18 10:00	02/13/18 11:05
10420487004	**SG-3**	Air	02/10/18 10:48	02/13/18 11:05
10420487005	**SG-6**	Air	02/10/18 11:22	02/13/18 11:05
10420487006	**SG-8**	Air	02/10/18 11:48	02/13/18 11:05
10420487007	**SG-7**	Air	02/10/18 12:22	02/13/18 11:05
10420487008	**SG-9**	Air	02/10/18 15:12	02/13/18 11:05
10420487009	**SG-13**	Air	02/10/18 16:15	02/13/18 11:05
10420487010	**SG-11**	Air	02/10/18 16:48	02/13/18 11:05
10420487011	**SG-10**	Air	02/11/18 08:40	02/13/18 11:05
10420487012	**SG-12**	Air	02/11/18 11:18	02/13/18 11:05
10420487013	**SG-14**	Air	02/11/18 11:48	02/13/18 11:05
10420487014	**SG-2**	Air	02/12/18 10:34	02/13/18 11:05
10420487015	**SG-4**	Air	02/12/18 11:33	02/13/18 11:05
10420487016	**SG-5**	Air	02/12/18 13:14	02/13/18 11:05
10420487017	**Unused Can # PACE2736**	Air		02/13/18 11:05
10420487018	**Unused Can # PACE2404**	Air		02/13/18 11:05

Pace Analytical Services, LLC
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(612)607-1700

SAMPLE ANALYTE COUNT

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10420487001	**SG-16**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487002	**SG-15**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487003	**SG-1**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487004	**SG-3**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487005	**SG-6**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487006	**SG-8**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487007	**SG-7**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487008	**SG-9**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487009	**SG-13**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487010	**SG-11**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487011	**SG-10**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487012	**SG-12**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487013	**SG-14**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487014	**SG-2**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487015	**SG-4**	TO-15	CH1, MLS	61	PASI-M
		TO-3 Air	CH1	1	PASI-M
10420487016	**SG-5**	TO-15	CH1	61	PASI-M
		TO-3 Air	CH1	1	PASI-M

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-16 **Lab ID: 10420487001** Collected: 02/10/18 08:47 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**523**	ug/m3	3.9	2.4	1.63		02/20/18 14:07	67-64-1	
Benzene	**55.7**	ug/m3	0.53	0.25	1.63		02/20/18 14:07	71-43-2	
Benzyl chloride	ND	ug/m3	1.7	0.38	1.63		02/20/18 14:07	100-44-7	
Bromodichloromethane	ND	ug/m3	2.2	0.58	1.63		02/20/18 14:07	75-27-4	
Bromoform	ND	ug/m3	8.6	1.1	1.63		02/20/18 14:07	75-25-2	
Bromomethane	ND	ug/m3	1.3	0.34	1.63		02/20/18 14:07	74-83-9	
1,3-Butadiene	ND	ug/m3	1.8	0.34	1.63		02/20/18 14:07	106-99-0	
2-Butanone (MEK)	**145**	ug/m3	4.9	0.33	1.63		02/20/18 14:07	78-93-3	
Carbon disulfide	**56.3**	ug/m3	1.0	0.29	1.63		02/20/18 14:07	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.0	0.52	1.63		02/20/18 14:07	56-23-5	
Chlorobenzene	ND	ug/m3	1.5	0.29	1.63		02/20/18 14:07	108-90-7	
Chloroethane	**79.0**	ug/m3	2.2	0.33	1.63		02/20/18 14:07	75-00-3	
Chloroform	ND	ug/m3	0.81	0.38	1.63		02/20/18 14:07	67-66-3	
Chloromethane	ND	ug/m3	0.68	0.22	1.63		02/20/18 14:07	74-87-3	
Cyclohexane	**388**	ug/m3	30.1	9.8	43.03		02/21/18 02:24	110-82-7	
Dibromochloromethane	ND	ug/m3	2.8	0.72	1.63		02/20/18 14:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.5	0.54	1.63		02/20/18 14:07	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.0	0.53	1.63		02/20/18 14:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.0	0.76	1.63		02/20/18 14:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.0	0.36	1.63		02/20/18 14:07	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.6	0.68	1.63		02/20/18 14:07	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.3	0.35	1.63		02/20/18 14:07	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.67	0.32	1.63		02/20/18 14:07	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.3	0.39	1.63		02/20/18 14:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.3	0.56	1.63		02/20/18 14:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.3	0.48	1.63		02/20/18 14:07	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.5	0.50	1.63		02/20/18 14:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.5	0.40	1.63		02/20/18 14:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.5	0.68	1.63		02/20/18 14:07	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.3	0.72	1.63		02/20/18 14:07	76-14-2	
Ethanol	**60.5**	ug/m3	3.1	0.76	1.63		02/20/18 14:07	64-17-5	
Ethyl acetate	ND	ug/m3	1.2	0.32	1.63		02/20/18 14:07	141-78-6	
Ethylbenzene	**8.7**	ug/m3	1.4	0.28	1.63		02/20/18 14:07	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.6	0.35	1.63		02/20/18 14:07	622-96-8	
n-Heptane	**157**	ug/m3	1.4	0.34	1.63		02/20/18 14:07	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.5	1.4	1.63		02/20/18 14:07	87-68-3	
n-Hexane	**506**	ug/m3	30.8	14.3	43.03		02/21/18 02:24	110-54-3	
2-Hexanone	ND	ug/m3	6.8	1.0	1.63		02/20/18 14:07	591-78-6	
Methylene Chloride	ND	ug/m3	5.8	2.5	1.63		02/20/18 14:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	**16.4**	ug/m3	6.8	0.58	1.63		02/20/18 14:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.0	1.1	1.63		02/20/18 14:07	1634-04-4	
Naphthalene	ND	ug/m3	4.3	0.97	1.63		02/20/18 14:07	91-20-3	
2-Propanol	ND	ug/m3	4.1	2.0	1.63		02/20/18 14:07	67-63-0	
Propylene	**1460**	ug/m3	0.57	0.26	1.63		02/20/18 14:07	115-07-1	E
Styrene	ND	ug/m3	1.4	0.27	1.63		02/20/18 14:07	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.1	0.47	1.63		02/20/18 14:07	79-34-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-16 **Lab ID: 10420487001** Collected: 02/10/18 08:47 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.1	0.47	1.63		02/20/18 14:07	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.98	0.45	1.63		02/20/18 14:07	109-99-9	
Toluene	**139**	ug/m3	1.2	0.26	1.63		02/20/18 14:07	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.1	1.6	1.63		02/20/18 14:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.8	0.56	1.63		02/20/18 14:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.90	0.37	1.63		02/20/18 14:07	79-00-5	
Trichloroethene	ND	ug/m3	0.89	0.44	1.63		02/20/18 14:07	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.9	0.68	1.63		02/20/18 14:07	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.5	0.60	1.63		02/20/18 14:07	76-13-1	
1,2,4-Trimethylbenzene	**3.8**	ug/m3	1.6	0.28	1.63		02/20/18 14:07	95-63-6	
1,3,5-Trimethylbenzene	**1.2J**	ug/m3	1.6	0.67	1.63		02/20/18 14:07	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.27	1.63		02/20/18 14:07	108-05-4	
Vinyl chloride	ND	ug/m3	2.1	0.21	1.63		02/20/18 14:07	75-01-4	
m&p-Xylene	**15.5**	ug/m3	2.9	0.57	1.63		02/20/18 14:07	179601-23-1	
o-Xylene	**4.5**	ug/m3	1.4	0.60	1.63		02/20/18 14:07	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**23900**	ppmv	21.5	0.91	2.15		03/02/18 08:56	74-82-8	E

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-15 **Lab ID: 10420487002** Collected: 02/10/18 09:23 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**105**	ug/m3	4.7	2.9	1.94		02/20/18 14:40	67-64-1	
Benzene	**25.8**	ug/m3	0.63	0.29	1.94		02/20/18 14:40	71-43-2	
Benzyl chloride	ND	ug/m3	2.0	0.46	1.94		02/20/18 14:40	100-44-7	
Bromodichloromethane	ND	ug/m3	2.6	0.69	1.94		02/20/18 14:40	75-27-4	
Bromoform	ND	ug/m3	10.2	1.3	1.94		02/20/18 14:40	75-25-2	
Bromomethane	ND	ug/m3	1.5	0.40	1.94		02/20/18 14:40	74-83-9	
1,3-Butadiene	ND	ug/m3	2.2	0.40	1.94		02/20/18 14:40	106-99-0	
2-Butanone (MEK)	**23.7**	ug/m3	5.8	0.39	1.94		02/20/18 14:40	78-93-3	
Carbon disulfide	**15.7**	ug/m3	1.2	0.35	1.94		02/20/18 14:40	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.2	0.62	1.94		02/20/18 14:40	56-23-5	
Chlorobenzene	ND	ug/m3	1.8	0.35	1.94		02/20/18 14:40	108-90-7	
Chloroethane	ND	ug/m3	2.6	0.40	1.94		02/20/18 14:40	75-00-3	
Chloroform	ND	ug/m3	0.96	0.45	1.94		02/20/18 14:40	67-66-3	
Chloromethane	ND	ug/m3	0.81	0.26	1.94		02/20/18 14:40	74-87-3	
Cyclohexane	ND	ug/m3	1.4	0.44	1.94		02/20/18 14:40	110-82-7	
Dibromochloromethane	ND	ug/m3	3.4	0.86	1.94		02/20/18 14:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	3.0	0.65	1.94		02/20/18 14:40	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.4	0.63	1.94		02/20/18 14:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.4	0.90	1.94		02/20/18 14:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.4	0.42	1.94		02/20/18 14:40	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	2.0	0.81	1.94		02/20/18 14:40	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.6	0.41	1.94		02/20/18 14:40	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.80	0.38	1.94		02/20/18 14:40	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.6	0.46	1.94		02/20/18 14:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.6	0.66	1.94		02/20/18 14:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.6	0.57	1.94		02/20/18 14:40	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.8	0.59	1.94		02/20/18 14:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.8	0.48	1.94		02/20/18 14:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.8	0.81	1.94		02/20/18 14:40	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.8	0.86	1.94		02/20/18 14:40	76-14-2	
Ethanol	ND	ug/m3	3.7	0.90	1.94		02/20/18 14:40	64-17-5	
Ethyl acetate	ND	ug/m3	1.4	0.38	1.94		02/20/18 14:40	141-78-6	
Ethylbenzene	**3.6**	ug/m3	1.7	0.33	1.94		02/20/18 14:40	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.9	0.42	1.94		02/20/18 14:40	622-96-8	
n-Heptane	**13.0**	ug/m3	1.6	0.41	1.94		02/20/18 14:40	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	4.2	1.7	1.94		02/20/18 14:40	87-68-3	
n-Hexane	**30.6**	ug/m3	1.4	0.65	1.94		02/20/18 14:40	110-54-3	
2-Hexanone	ND	ug/m3	8.1	1.2	1.94		02/20/18 14:40	591-78-6	
Methylene Chloride	ND	ug/m3	6.8	2.9	1.94		02/20/18 14:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	**4.9J**	ug/m3	8.1	0.69	1.94		02/20/18 14:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	7.1	1.3	1.94		02/20/18 14:40	1634-04-4	
Naphthalene	ND	ug/m3	5.2	1.2	1.94		02/20/18 14:40	91-20-3	
2-Propanol	**8.7**	ug/m3	4.8	2.4	1.94		02/20/18 14:40	67-63-0	
Propylene	**432**	ug/m3	0.68	0.30	1.94		02/20/18 14:40	115-07-1	E
Styrene	ND	ug/m3	1.7	0.32	1.94		02/20/18 14:40	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.4	0.56	1.94		02/20/18 14:40	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-15 **Lab ID: 10420487002** Collected: 02/10/18 09:23 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.3	0.56	1.94		02/20/18 14:40	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.2	0.53	1.94		02/20/18 14:40	109-99-9	
Toluene	**24.2**	ug/m3	1.5	0.31	1.94		02/20/18 14:40	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	7.3	1.9	1.94		02/20/18 14:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.2	0.66	1.94		02/20/18 14:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.1	0.44	1.94		02/20/18 14:40	79-00-5	
Trichloroethene	ND	ug/m3	1.1	0.52	1.94		02/20/18 14:40	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.2	0.81	1.94		02/20/18 14:40	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	3.0	0.72	1.94		02/20/18 14:40	76-13-1	
1,2,4-Trimethylbenzene	**3.0**	ug/m3	1.9	0.33	1.94		02/20/18 14:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.9	0.80	1.94		02/20/18 14:40	108-67-8	
Vinyl acetate	ND	ug/m3	1.4	0.32	1.94		02/20/18 14:40	108-05-4	
Vinyl chloride	ND	ug/m3	2.5	0.24	1.94		02/20/18 14:40	75-01-4	
m&p-Xylene	**10.0**	ug/m3	3.4	0.68	1.94		02/20/18 14:40	179601-23-1	
o-Xylene	**2.0**	ug/m3	1.7	0.72	1.94		02/20/18 14:40	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**7240**	ppmv	27.0	1.1	2.7		03/02/18 09:05	74-82-8	E

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-1 **Lab ID: 10420487003** Collected: 02/10/18 10:00 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**122**	ug/m3	4.3	2.7	1.77		02/20/18 15:15	67-64-1	
Benzene	**16.1**	ug/m3	0.58	0.27	1.77		02/20/18 15:15	71-43-2	
Benzyl chloride	ND	ug/m3	1.9	0.42	1.77		02/20/18 15:15	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.63	1.77		02/20/18 15:15	75-27-4	
Bromoform	ND	ug/m3	9.3	1.2	1.77		02/20/18 15:15	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.37	1.77		02/20/18 15:15	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.36	1.77		02/20/18 15:15	106-99-0	
2-Butanone (MEK)	**26.7**	ug/m3	5.3	0.36	1.77		02/20/18 15:15	78-93-3	
Carbon disulfide	ND	ug/m3	1.1	0.32	1.77		02/20/18 15:15	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.56	1.77		02/20/18 15:15	56-23-5	
Chlorobenzene	ND	ug/m3	1.7	0.32	1.77		02/20/18 15:15	108-90-7	
Chloroethane	ND	ug/m3	2.4	0.36	1.77		02/20/18 15:15	75-00-3	
Chloroform	ND	ug/m3	0.88	0.41	1.77		02/20/18 15:15	67-66-3	
Chloromethane	ND	ug/m3	0.74	0.24	1.77		02/20/18 15:15	74-87-3	
Cyclohexane	**10**	ug/m3	1.2	0.40	1.77		02/20/18 15:15	110-82-7	
Dibromochloromethane	ND	ug/m3	3.1	0.78	1.77		02/20/18 15:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.8	0.59	1.77		02/20/18 15:15	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.2	0.58	1.77		02/20/18 15:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.2	0.82	1.77		02/20/18 15:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.2	0.39	1.77		02/20/18 15:15	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.74	1.77		02/20/18 15:15	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.5	0.38	1.77		02/20/18 15:15	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.73	0.35	1.77		02/20/18 15:15	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.42	1.77		02/20/18 15:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.60	1.77		02/20/18 15:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.52	1.77		02/20/18 15:15	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.7	0.54	1.77		02/20/18 15:15	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.43	1.77		02/20/18 15:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.74	1.77		02/20/18 15:15	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.5	0.78	1.77		02/20/18 15:15	76-14-2	
Ethanol	**17.1**	ug/m3	3.4	0.82	1.77		02/20/18 15:15	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.35	1.77		02/20/18 15:15	141-78-6	
Ethylbenzene	**5.5**	ug/m3	1.6	0.30	1.77		02/20/18 15:15	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.8	0.38	1.77		02/20/18 15:15	622-96-8	
n-Heptane	**12.3**	ug/m3	1.5	0.37	1.77		02/20/18 15:15	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.8	1.5	1.77		02/20/18 15:15	87-68-3	
n-Hexane	**34.7**	ug/m3	1.3	0.59	1.77		02/20/18 15:15	110-54-3	
2-Hexanone	ND	ug/m3	7.4	1.1	1.77		02/20/18 15:15	591-78-6	
Methylene Chloride	**77.9**	ug/m3	6.2	2.7	1.77		02/20/18 15:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.4	0.63	1.77		02/20/18 15:15	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.5	1.2	1.77		02/20/18 15:15	1634-04-4	
Naphthalene	ND	ug/m3	4.7	1.1	1.77		02/20/18 15:15	91-20-3	
2-Propanol	**6.8**	ug/m3	4.4	2.2	1.77		02/20/18 15:15	67-63-0	
Propylene	ND	ug/m3	0.62	0.28	1.77		02/20/18 15:15	115-07-1	
Styrene	ND	ug/m3	1.5	0.30	1.77		02/20/18 15:15	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.51	1.77		02/20/18 15:15	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-1 **Lab ID: 10420487003** Collected: 02/10/18 10:00 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.51	1.77		02/20/18 15:15	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.1	0.48	1.77		02/20/18 15:15	109-99-9	
Toluene	**28.4**	ug/m3	1.4	0.28	1.77		02/20/18 15:15	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.7	1.7	1.77		02/20/18 15:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.0	0.61	1.77		02/20/18 15:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.98	0.40	1.77		02/20/18 15:15	79-00-5	
Trichloroethene	ND	ug/m3	0.97	0.47	1.77		02/20/18 15:15	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	0.74	1.77		02/20/18 15:15	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.8	0.65	1.77		02/20/18 15:15	76-13-1	
1,2,4-Trimethylbenzene	**1.5J**	ug/m3	1.8	0.30	1.77		02/20/18 15:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.8	0.73	1.77		02/20/18 15:15	108-67-8	
Vinyl acetate	ND	ug/m3	1.3	0.29	1.77		02/20/18 15:15	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.22	1.77		02/20/18 15:15	75-01-4	
m&p-Xylene	**6.0**	ug/m3	3.1	0.62	1.77		02/20/18 15:15	179601-23-1	
o-Xylene	**1.3J**	ug/m3	1.6	0.66	1.77		02/20/18 15:15	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**72.1**	ppmv	29.7	1.3	2.97		03/02/18 09:15	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-3 **Lab ID: 10420487004** Collected: 02/10/18 10:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**110**	ug/m3	4.2	2.6	1.74		02/20/18 15:49	67-64-1	
Benzene	**18.1**	ug/m3	0.57	0.26	1.74		02/20/18 15:49	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.41	1.74		02/20/18 15:49	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.62	1.74		02/20/18 15:49	75-27-4	
Bromoform	ND	ug/m3	9.1	1.2	1.74		02/20/18 15:49	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.36	1.74		02/20/18 15:49	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.36	1.74		02/20/18 15:49	106-99-0	
2-Butanone (MEK)	**29.4**	ug/m3	5.2	0.35	1.74		02/20/18 15:49	78-93-3	
Carbon disulfide	ND	ug/m3	1.1	0.31	1.74		02/20/18 15:49	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.55	1.74		02/20/18 15:49	56-23-5	
Chlorobenzene	**1.2J**	ug/m3	1.6	0.31	1.74		02/20/18 15:49	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.35	1.74		02/20/18 15:49	75-00-3	
Chloroform	ND	ug/m3	0.86	0.40	1.74		02/20/18 15:49	67-66-3	
Chloromethane	ND	ug/m3	0.73	0.23	1.74		02/20/18 15:49	74-87-3	
Cyclohexane	ND	ug/m3	1.2	0.39	1.74		02/20/18 15:49	110-82-7	
Dibromochloromethane	ND	ug/m3	3.0	0.77	1.74		02/20/18 15:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.7	0.58	1.74		02/20/18 15:49	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.1	0.57	1.74		02/20/18 15:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.1	0.81	1.74		02/20/18 15:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.1	0.38	1.74		02/20/18 15:49	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.72	1.74		02/20/18 15:49	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.37	1.74		02/20/18 15:49	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.72	0.34	1.74		02/20/18 15:49	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.41	1.74		02/20/18 15:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.59	1.74		02/20/18 15:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.51	1.74		02/20/18 15:49	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.53	1.74		02/20/18 15:49	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.43	1.74		02/20/18 15:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.73	1.74		02/20/18 15:49	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.5	0.77	1.74		02/20/18 15:49	76-14-2	
Ethanol	ND	ug/m3	3.3	0.81	1.74		02/20/18 15:49	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.34	1.74		02/20/18 15:49	141-78-6	
Ethylbenzene	**9.2**	ug/m3	1.5	0.30	1.74		02/20/18 15:49	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.37	1.74		02/20/18 15:49	622-96-8	
n-Heptane	**13.9**	ug/m3	1.4	0.37	1.74		02/20/18 15:49	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.8	1.5	1.74		02/20/18 15:49	87-68-3	
n-Hexane	**27.7**	ug/m3	1.2	0.58	1.74		02/20/18 15:49	110-54-3	
2-Hexanone	ND	ug/m3	7.2	1.1	1.74		02/20/18 15:49	591-78-6	
Methylene Chloride	ND	ug/m3	6.1	2.6	1.74		02/20/18 15:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.2	0.62	1.74		02/20/18 15:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.4	1.2	1.74		02/20/18 15:49	1634-04-4	
Naphthalene	ND	ug/m3	4.6	1.0	1.74		02/20/18 15:49	91-20-3	
2-Propanol	ND	ug/m3	4.4	2.2	1.74		02/20/18 15:49	67-63-0	
Propylene	**380**	ug/m3	0.61	0.27	1.74		02/20/18 15:49	115-07-1	E
Styrene	ND	ug/m3	1.5	0.29	1.74		02/20/18 15:49	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.50	1.74		02/20/18 15:49	79-34-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-3 **Lab ID: 10420487004** Collected: 02/10/18 10:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.50	1.74		02/20/18 15:49	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.48	1.74		02/20/18 15:49	109-99-9	
Toluene	**25.9**	ug/m3	1.3	0.28	1.74		02/20/18 15:49	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.6	1.7	1.74		02/20/18 15:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.60	1.74		02/20/18 15:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.97	0.39	1.74		02/20/18 15:49	79-00-5	
Trichloroethene	ND	ug/m3	0.95	0.47	1.74		02/20/18 15:49	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	0.73	1.74		02/20/18 15:49	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.7	0.64	1.74		02/20/18 15:49	76-13-1	
1,2,4-Trimethylbenzene	**1.0J**	ug/m3	1.7	0.30	1.74		02/20/18 15:49	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.72	1.74		02/20/18 15:49	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.29	1.74		02/20/18 15:49	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.22	1.74		02/20/18 15:49	75-01-4	
m&p-Xylene	**18.5**	ug/m3	3.1	0.61	1.74		02/20/18 15:49	179601-23-1	
o-Xylene	**9.4**	ug/m3	1.5	0.65	1.74		02/20/18 15:49	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**35.7**	ppmv	24.2	1.0	2.42		03/02/18 09:24	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-6 **Lab ID: 10420487005** Collected: 02/10/18 11:22 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**100**	ug/m3	4.3	2.7	1.8		02/20/18 16:22	67-64-1	
Benzene	**10.7**	ug/m3	0.58	0.27	1.8		02/20/18 16:22	71-43-2	
Benzyl chloride	ND	ug/m3	1.9	0.42	1.8		02/20/18 16:22	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.64	1.8		02/20/18 16:22	75-27-4	
Bromoform	ND	ug/m3	9.5	1.2	1.8		02/20/18 16:22	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.37	1.8		02/20/18 16:22	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.37	1.8		02/20/18 16:22	106-99-0	
2-Butanone (MEK)	**22.4**	ug/m3	5.4	0.37	1.8		02/20/18 16:22	78-93-3	
Carbon disulfide	**6.7**	ug/m3	1.1	0.32	1.8		02/20/18 16:22	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.2	0.57	1.8		02/20/18 16:22	56-23-5	
Chlorobenzene	ND	ug/m3	1.7	0.32	1.8		02/20/18 16:22	108-90-7	
Chloroethane	ND	ug/m3	2.4	0.37	1.8		02/20/18 16:22	75-00-3	
Chloroform	ND	ug/m3	0.89	0.42	1.8		02/20/18 16:22	67-66-3	
Chloromethane	ND	ug/m3	0.76	0.24	1.8		02/20/18 16:22	74-87-3	
Cyclohexane	ND	ug/m3	1.3	0.41	1.8		02/20/18 16:22	110-82-7	
Dibromochloromethane	ND	ug/m3	3.1	0.80	1.8		02/20/18 16:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.8	0.60	1.8		02/20/18 16:22	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.2	0.59	1.8		02/20/18 16:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.2	0.84	1.8		02/20/18 16:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.2	0.39	1.8		02/20/18 16:22	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.75	1.8		02/20/18 16:22	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.5	0.38	1.8		02/20/18 16:22	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.74	0.36	1.8		02/20/18 16:22	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.5	0.43	1.8		02/20/18 16:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.5	0.61	1.8		02/20/18 16:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.5	0.53	1.8		02/20/18 16:22	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.7	0.55	1.8		02/20/18 16:22	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.7	0.44	1.8		02/20/18 16:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.7	0.76	1.8		02/20/18 16:22	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.6	0.80	1.8		02/20/18 16:22	76-14-2	
Ethanol	ND	ug/m3	3.4	0.84	1.8		02/20/18 16:22	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.35	1.8		02/20/18 16:22	141-78-6	
Ethylbenzene	**3.4**	ug/m3	1.6	0.31	1.8		02/20/18 16:22	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.8	0.39	1.8		02/20/18 16:22	622-96-8	
n-Heptane	**6.2**	ug/m3	1.5	0.38	1.8		02/20/18 16:22	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.9	1.6	1.8		02/20/18 16:22	87-68-3	
n-Hexane	**13.1**	ug/m3	1.3	0.60	1.8		02/20/18 16:22	110-54-3	
2-Hexanone	ND	ug/m3	7.5	1.1	1.8		02/20/18 16:22	591-78-6	
Methylene Chloride	ND	ug/m3	6.4	2.7	1.8		02/20/18 16:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.5	0.64	1.8		02/20/18 16:22	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.6	1.2	1.8		02/20/18 16:22	1634-04-4	
Naphthalene	ND	ug/m3	4.8	1.1	1.8		02/20/18 16:22	91-20-3	
2-Propanol	**7.8**	ug/m3	4.5	2.2	1.8		02/20/18 16:22	67-63-0	
Propylene	**237**	ug/m3	0.63	0.28	1.8		02/20/18 16:22	115-07-1	E
Styrene	ND	ug/m3	1.6	0.30	1.8		02/20/18 16:22	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.3	0.52	1.8		02/20/18 16:22	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-6 **Lab ID: 10420487005** Collected: 02/10/18 11:22 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.52	1.8		02/20/18 16:22	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.1	0.49	1.8		02/20/18 16:22	109-99-9	
Toluene	**28.9**	ug/m3	1.4	0.29	1.8		02/20/18 16:22	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.8	1.7	1.8		02/20/18 16:22	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.0	0.62	1.8		02/20/18 16:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.0	0.40	1.8		02/20/18 16:22	79-00-5	
Trichloroethene	ND	ug/m3	0.98	0.48	1.8		02/20/18 16:22	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.1	0.75	1.8		02/20/18 16:22	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.8	0.66	1.8		02/20/18 16:22	76-13-1	
1,2,4-Trimethylbenzene	**0.96J**	ug/m3	1.8	0.31	1.8		02/20/18 16:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.8	0.74	1.8		02/20/18 16:22	108-67-8	
Vinyl acetate	ND	ug/m3	1.3	0.30	1.8		02/20/18 16:22	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.23	1.8		02/20/18 16:22	75-01-4	
m&p-Xylene	**5.2**	ug/m3	3.2	0.63	1.8		02/20/18 16:22	179601-23-1	
o-Xylene	ND	ug/m3	1.6	0.67	1.8		02/20/18 16:22	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**24.3**	ppmv	23.7	1.0	2.37		03/02/18 09:34	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-8 **Lab ID: 10420487006** Collected: 02/10/18 11:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**88.4**	ug/m3	4.2	2.6	1.74		02/20/18 16:55	67-64-1	
Benzene	**10.3**	ug/m3	0.57	0.26	1.74		02/20/18 16:55	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.41	1.74		02/20/18 16:55	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.62	1.74		02/20/18 16:55	75-27-4	
Bromoform	ND	ug/m3	9.1	1.2	1.74		02/20/18 16:55	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.36	1.74		02/20/18 16:55	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.36	1.74		02/20/18 16:55	106-99-0	
2-Butanone (MEK)	**19.7**	ug/m3	5.2	0.35	1.74		02/20/18 16:55	78-93-3	
Carbon disulfide	ND	ug/m3	1.1	0.31	1.74		02/20/18 16:55	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.55	1.74		02/20/18 16:55	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	0.31	1.74		02/20/18 16:55	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.35	1.74		02/20/18 16:55	75-00-3	
Chloroform	ND	ug/m3	0.86	0.40	1.74		02/20/18 16:55	67-66-3	
Chloromethane	ND	ug/m3	0.73	0.23	1.74		02/20/18 16:55	74-87-3	
Cyclohexane	ND	ug/m3	1.2	0.39	1.74		02/20/18 16:55	110-82-7	
Dibromochloromethane	ND	ug/m3	3.0	0.77	1.74		02/20/18 16:55	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.7	0.58	1.74		02/20/18 16:55	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.1	0.57	1.74		02/20/18 16:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.1	0.81	1.74		02/20/18 16:55	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.1	0.38	1.74		02/20/18 16:55	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.72	1.74		02/20/18 16:55	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.37	1.74		02/20/18 16:55	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.72	0.34	1.74		02/20/18 16:55	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.41	1.74		02/20/18 16:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.59	1.74		02/20/18 16:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.51	1.74		02/20/18 16:55	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.53	1.74		02/20/18 16:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.43	1.74		02/20/18 16:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.73	1.74		02/20/18 16:55	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.5	0.77	1.74		02/20/18 16:55	76-14-2	
Ethanol	ND	ug/m3	3.3	0.81	1.74		02/20/18 16:55	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.34	1.74		02/20/18 16:55	141-78-6	
Ethylbenzene	**3.7**	ug/m3	1.5	0.30	1.74		02/20/18 16:55	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.37	1.74		02/20/18 16:55	622-96-8	
n-Heptane	**6.6**	ug/m3	1.4	0.37	1.74		02/20/18 16:55	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.8	1.5	1.74		02/20/18 16:55	87-68-3	
n-Hexane	**15.7**	ug/m3	1.2	0.58	1.74		02/20/18 16:55	110-54-3	
2-Hexanone	ND	ug/m3	7.2	1.1	1.74		02/20/18 16:55	591-78-6	
Methylene Chloride	ND	ug/m3	6.1	2.6	1.74		02/20/18 16:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.2	0.62	1.74		02/20/18 16:55	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.4	1.2	1.74		02/20/18 16:55	1634-04-4	
Naphthalene	ND	ug/m3	4.6	1.0	1.74		02/20/18 16:55	91-20-3	
2-Propanol	**6.7**	ug/m3	4.4	2.2	1.74		02/20/18 16:55	67-63-0	
Propylene	**264**	ug/m3	0.61	0.27	1.74		02/20/18 16:55	115-07-1	E
Styrene	ND	ug/m3	1.5	0.29	1.74		02/20/18 16:55	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.50	1.74		02/20/18 16:55	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-8 **Lab ID: 10420487006** Collected: 02/10/18 11:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.50	1.74		02/20/18 16:55	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.48	1.74		02/20/18 16:55	109-99-9	
Toluene	**32.0**	ug/m3	1.3	0.28	1.74		02/20/18 16:55	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.6	1.7	1.74		02/20/18 16:55	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.60	1.74		02/20/18 16:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.97	0.39	1.74		02/20/18 16:55	79-00-5	
Trichloroethene	ND	ug/m3	0.95	0.47	1.74		02/20/18 16:55	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	0.73	1.74		02/20/18 16:55	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.7	0.64	1.74		02/20/18 16:55	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.7	0.30	1.74		02/20/18 16:55	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.72	1.74		02/20/18 16:55	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.29	1.74		02/20/18 16:55	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.22	1.74		02/20/18 16:55	75-01-4	
m&p-Xylene	**5.4**	ug/m3	3.1	0.61	1.74		02/20/18 16:55	179601-23-1	
o-Xylene	ND	ug/m3	1.5	0.65	1.74		02/20/18 16:55	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**26.9**	ppmv	23.0	0.97	2.3		03/02/18 09:43	74-82-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-7 **Lab ID: 10420487007** Collected: 02/10/18 12:22 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**49.6**	ug/m3	4.0	2.5	1.68		02/20/18 17:28	67-64-1	
Benzene	**26.5**	ug/m3	0.55	0.25	1.68		02/20/18 17:28	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.40	1.68		02/20/18 17:28	100-44-7	
Bromodichloromethane	ND	ug/m3	2.3	0.60	1.68		02/20/18 17:28	75-27-4	
Bromoform	ND	ug/m3	8.8	1.2	1.68		02/20/18 17:28	75-25-2	
Bromomethane	ND	ug/m3	1.3	0.35	1.68		02/20/18 17:28	74-83-9	
1,3-Butadiene	ND	ug/m3	1.9	0.35	1.68		02/20/18 17:28	106-99-0	
2-Butanone (MEK)	**9.6**	ug/m3	5.0	0.34	1.68		02/20/18 17:28	78-93-3	
Carbon disulfide	ND	ug/m3	1.1	0.30	1.68		02/20/18 17:28	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.53	1.68		02/20/18 17:28	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	0.30	1.68		02/20/18 17:28	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.34	1.68		02/20/18 17:28	75-00-3	
Chloroform	ND	ug/m3	0.83	0.39	1.68		02/20/18 17:28	67-66-3	
Chloromethane	ND	ug/m3	0.71	0.23	1.68		02/20/18 17:28	74-87-3	
Cyclohexane	**15.9**	ug/m3	1.2	0.38	1.68		02/20/18 17:28	110-82-7	
Dibromochloromethane	ND	ug/m3	2.9	0.74	1.68		02/20/18 17:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.6	0.56	1.68		02/20/18 17:28	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.0	0.55	1.68		02/20/18 17:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.0	0.78	1.68		02/20/18 17:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.0	0.37	1.68		02/20/18 17:28	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.7	0.70	1.68		02/20/18 17:28	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.36	1.68		02/20/18 17:28	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.69	0.33	1.68		02/20/18 17:28	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.40	1.68		02/20/18 17:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.57	1.68		02/20/18 17:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.50	1.68		02/20/18 17:28	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.51	1.68		02/20/18 17:28	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.41	1.68		02/20/18 17:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.71	1.68		02/20/18 17:28	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.4	0.74	1.68		02/20/18 17:28	76-14-2	
Ethanol	ND	ug/m3	3.2	0.78	1.68		02/20/18 17:28	64-17-5	
Ethyl acetate	ND	ug/m3	1.2	0.33	1.68		02/20/18 17:28	141-78-6	
Ethylbenzene	**16.6**	ug/m3	1.5	0.29	1.68		02/20/18 17:28	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.36	1.68		02/20/18 17:28	622-96-8	
n-Heptane	**17.6**	ug/m3	1.4	0.35	1.68		02/20/18 17:28	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.6	1.5	1.68		02/20/18 17:28	87-68-3	
n-Hexane	**34.5**	ug/m3	1.2	0.56	1.68		02/20/18 17:28	110-54-3	
2-Hexanone	ND	ug/m3	7.0	1.0	1.68		02/20/18 17:28	591-78-6	
Methylene Chloride	ND	ug/m3	5.9	2.6	1.68		02/20/18 17:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.0	0.60	1.68		02/20/18 17:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.1	1.1	1.68		02/20/18 17:28	1634-04-4	
Naphthalene	ND	ug/m3	4.5	1.0	1.68		02/20/18 17:28	91-20-3	
2-Propanol	ND	ug/m3	4.2	2.1	1.68		02/20/18 17:28	67-63-0	
Propylene	**265**	ug/m3	0.59	0.26	1.68		02/20/18 17:28	115-07-1	E
Styrene	ND	ug/m3	1.5	0.28	1.68		02/20/18 17:28	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.49	1.68		02/20/18 17:28	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-7 **Lab ID: 10420487007** Collected: 02/10/18 12:22 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.48	1.68		02/20/18 17:28	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.46	1.68		02/20/18 17:28	109-99-9	
Toluene	**37.0**	ug/m3	1.3	0.27	1.68		02/20/18 17:28	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.3	1.6	1.68		02/20/18 17:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.57	1.68		02/20/18 17:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.93	0.38	1.68		02/20/18 17:28	79-00-5	
Trichloroethene	ND	ug/m3	0.92	0.45	1.68		02/20/18 17:28	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.9	0.70	1.68		02/20/18 17:28	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.6	0.62	1.68		02/20/18 17:28	76-13-1	
1,2,4-Trimethylbenzene	**1.4J**	ug/m3	1.7	0.29	1.68		02/20/18 17:28	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.69	1.68		02/20/18 17:28	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.28	1.68		02/20/18 17:28	108-05-4	
Vinyl chloride	ND	ug/m3	2.2	0.21	1.68		02/20/18 17:28	75-01-4	
m&p-Xylene	**6.7**	ug/m3	3.0	0.59	1.68		02/20/18 17:28	179601-23-1	
o-Xylene	**1.3J**	ug/m3	1.5	0.62	1.68		02/20/18 17:28	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**27.3**	ppmv	22.2	0.94	2.22		03/02/18 09:53	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-9 **Lab ID: 10420487008** Collected: 02/10/18 15:12 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**155**	ug/m3	4.3	2.7	1.8		02/20/18 18:01	67-64-1	
Benzene	**23.2**	ug/m3	0.58	0.27	1.8		02/20/18 18:01	71-43-2	
Benzyl chloride	ND	ug/m3	1.9	0.42	1.8		02/20/18 18:01	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.64	1.8		02/20/18 18:01	75-27-4	
Bromoform	ND	ug/m3	9.5	1.2	1.8		02/20/18 18:01	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.37	1.8		02/20/18 18:01	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.37	1.8		02/20/18 18:01	106-99-0	
2-Butanone (MEK)	**35.5**	ug/m3	5.4	0.37	1.8		02/20/18 18:01	78-93-3	
Carbon disulfide	ND	ug/m3	1.1	0.32	1.8		02/20/18 18:01	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.2	0.57	1.8		02/20/18 18:01	56-23-5	
Chlorobenzene	ND	ug/m3	1.7	0.32	1.8		02/20/18 18:01	108-90-7	
Chloroethane	ND	ug/m3	2.4	0.37	1.8		02/20/18 18:01	75-00-3	
Chloroform	ND	ug/m3	0.89	0.42	1.8		02/20/18 18:01	67-66-3	
Chloromethane	ND	ug/m3	0.76	0.24	1.8		02/20/18 18:01	74-87-3	
Cyclohexane	**23.0**	ug/m3	1.3	0.41	1.8		02/20/18 18:01	110-82-7	
Dibromochloromethane	ND	ug/m3	3.1	0.80	1.8		02/20/18 18:01	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.8	0.60	1.8		02/20/18 18:01	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.2	0.59	1.8		02/20/18 18:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.2	0.84	1.8		02/20/18 18:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.2	0.39	1.8		02/20/18 18:01	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.75	1.8		02/20/18 18:01	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.5	0.38	1.8		02/20/18 18:01	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.74	0.36	1.8		02/20/18 18:01	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.5	0.43	1.8		02/20/18 18:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.5	0.61	1.8		02/20/18 18:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.5	0.53	1.8		02/20/18 18:01	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.7	0.55	1.8		02/20/18 18:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.7	0.44	1.8		02/20/18 18:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.7	0.76	1.8		02/20/18 18:01	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.6	0.80	1.8		02/20/18 18:01	76-14-2	
Ethanol	**36.8**	ug/m3	3.4	0.84	1.8		02/20/18 18:01	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.35	1.8		02/20/18 18:01	141-78-6	
Ethylbenzene	**19.7**	ug/m3	1.6	0.31	1.8		02/20/18 18:01	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.8	0.39	1.8		02/20/18 18:01	622-96-8	
n-Heptane	**27.7**	ug/m3	1.5	0.38	1.8		02/20/18 18:01	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.9	1.6	1.8		02/20/18 18:01	87-68-3	
n-Hexane	**52.0**	ug/m3	1.3	0.60	1.8		02/20/18 18:01	110-54-3	
2-Hexanone	ND	ug/m3	7.5	1.1	1.8		02/20/18 18:01	591-78-6	
Methylene Chloride	ND	ug/m3	6.4	2.7	1.8		02/20/18 18:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.5	0.64	1.8		02/20/18 18:01	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.6	1.2	1.8		02/20/18 18:01	1634-04-4	
Naphthalene	ND	ug/m3	4.8	1.1	1.8		02/20/18 18:01	91-20-3	
2-Propanol	ND	ug/m3	4.5	2.2	1.8		02/20/18 18:01	67-63-0	
Propylene	**275**	ug/m3	0.63	0.28	1.8		02/20/18 18:01	115-07-1	E
Styrene	ND	ug/m3	1.6	0.30	1.8		02/20/18 18:01	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.3	0.52	1.8		02/20/18 18:01	79-34-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-9 **Lab ID: 10420487008** Collected: 02/10/18 15:12 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.52	1.8		02/20/18 18:01	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.1	0.49	1.8		02/20/18 18:01	109-99-9	
Toluene	**54.9**	ug/m3	1.4	0.29	1.8		02/20/18 18:01	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.8	1.7	1.8		02/20/18 18:01	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.0	0.62	1.8		02/20/18 18:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.0	0.40	1.8		02/20/18 18:01	79-00-5	
Trichloroethene	ND	ug/m3	0.98	0.48	1.8		02/20/18 18:01	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.1	0.75	1.8		02/20/18 18:01	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.8	0.66	1.8		02/20/18 18:01	76-13-1	
1,2,4-Trimethylbenzene	**1.3J**	ug/m3	1.8	0.31	1.8		02/20/18 18:01	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.8	0.74	1.8		02/20/18 18:01	108-67-8	
Vinyl acetate	ND	ug/m3	1.3	0.30	1.8		02/20/18 18:01	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.23	1.8		02/20/18 18:01	75-01-4	
m&p-Xylene	**9.2**	ug/m3	3.2	0.63	1.8		02/20/18 18:01	179601-23-1	
o-Xylene	**2.1**	ug/m3	1.6	0.67	1.8		02/20/18 18:01	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**5390**	ppmv	23.7	1.0	2.37		03/02/18 10:02	74-82-8	E

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-13 **Lab ID: 10420487009** Collected: 02/10/18 16:15 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**138**	ug/m3	4.3	2.7	1.77		02/20/18 18:35	67-64-1	
Benzene	**3.3**	ug/m3	0.58	0.27	1.77		02/20/18 18:35	71-43-2	
Benzyl chloride	ND	ug/m3	1.9	0.42	1.77		02/20/18 18:35	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.63	1.77		02/20/18 18:35	75-27-4	
Bromoform	ND	ug/m3	9.3	1.2	1.77		02/20/18 18:35	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.37	1.77		02/20/18 18:35	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.36	1.77		02/20/18 18:35	106-99-0	
2-Butanone (MEK)	**11.3**	ug/m3	5.3	0.36	1.77		02/20/18 18:35	78-93-3	
Carbon disulfide	ND	ug/m3	1.1	0.32	1.77		02/20/18 18:35	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.56	1.77		02/20/18 18:35	56-23-5	
Chlorobenzene	ND	ug/m3	1.7	0.32	1.77		02/20/18 18:35	108-90-7	
Chloroethane	ND	ug/m3	2.4	0.36	1.77		02/20/18 18:35	75-00-3	
Chloroform	ND	ug/m3	0.88	0.41	1.77		02/20/18 18:35	67-66-3	
Chloromethane	ND	ug/m3	0.74	0.24	1.77		02/20/18 18:35	74-87-3	
Cyclohexane	ND	ug/m3	1.2	0.40	1.77		02/20/18 18:35	110-82-7	
Dibromochloromethane	ND	ug/m3	3.1	0.78	1.77		02/20/18 18:35	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.8	0.59	1.77		02/20/18 18:35	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.2	0.58	1.77		02/20/18 18:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.2	0.82	1.77		02/20/18 18:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.2	0.39	1.77		02/20/18 18:35	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.74	1.77		02/20/18 18:35	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.5	0.38	1.77		02/20/18 18:35	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.73	0.35	1.77		02/20/18 18:35	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.42	1.77		02/20/18 18:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.60	1.77		02/20/18 18:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.52	1.77		02/20/18 18:35	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.7	0.54	1.77		02/20/18 18:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.43	1.77		02/20/18 18:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.74	1.77		02/20/18 18:35	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.5	0.78	1.77		02/20/18 18:35	76-14-2	
Ethanol	**40.0**	ug/m3	3.4	0.82	1.77		02/20/18 18:35	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.35	1.77		02/20/18 18:35	141-78-6	
Ethylbenzene	**2.6**	ug/m3	1.6	0.30	1.77		02/20/18 18:35	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.8	0.38	1.77		02/20/18 18:35	622-96-8	
n-Heptane	**3.2**	ug/m3	1.5	0.37	1.77		02/20/18 18:35	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.8	1.5	1.77		02/20/18 18:35	87-68-3	
n-Hexane	ND	ug/m3	1.3	0.59	1.77		02/20/18 18:35	110-54-3	
2-Hexanone	ND	ug/m3	7.4	1.1	1.77		02/20/18 18:35	591-78-6	
Methylene Chloride	ND	ug/m3	6.2	2.7	1.77		02/20/18 18:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.4	0.63	1.77		02/20/18 18:35	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.5	1.2	1.77		02/20/18 18:35	1634-04-4	
Naphthalene	ND	ug/m3	4.7	1.1	1.77		02/20/18 18:35	91-20-3	
2-Propanol	**20.9**	ug/m3	4.4	2.2	1.77		02/20/18 18:35	67-63-0	
Propylene	ND	ug/m3	0.62	0.28	1.77		02/20/18 18:35	115-07-1	
Styrene	ND	ug/m3	1.5	0.30	1.77		02/20/18 18:35	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.51	1.77		02/20/18 18:35	79-34-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-13 **Lab ID: 10420487009** Collected: 02/10/18 16:15 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	**6.6**	ug/m3	1.2	0.51	1.77		02/20/18 18:35	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.1	0.48	1.77		02/20/18 18:35	109-99-9	
Toluene	**20.9**	ug/m3	1.4	0.28	1.77		02/20/18 18:35	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.7	1.7	1.77		02/20/18 18:35	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.0	0.61	1.77		02/20/18 18:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.98	0.40	1.77		02/20/18 18:35	79-00-5	
Trichloroethene	ND	ug/m3	0.97	0.47	1.77		02/20/18 18:35	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	0.74	1.77		02/20/18 18:35	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.8	0.65	1.77		02/20/18 18:35	76-13-1	
1,2,4-Trimethylbenzene	**0.98J**	ug/m3	1.8	0.30	1.77		02/20/18 18:35	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.8	0.73	1.77		02/20/18 18:35	108-67-8	
Vinyl acetate	ND	ug/m3	1.3	0.29	1.77		02/20/18 18:35	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.22	1.77		02/20/18 18:35	75-01-4	
m&p-Xylene	**6.1**	ug/m3	3.1	0.62	1.77		02/20/18 18:35	179601-23-1	
o-Xylene	ND	ug/m3	1.6	0.66	1.77		02/20/18 18:35	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**1580**	ppmv	23.4	0.99	2.34		03/02/18 10:12	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-11 **Lab ID: 10420487010** Collected: 02/10/18 16:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**119**	ug/m3	4.0	2.5	1.68		02/20/18 19:10	67-64-1	
Benzene	**12.9**	ug/m3	0.55	0.25	1.68		02/20/18 19:10	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.40	1.68		02/20/18 19:10	100-44-7	
Bromodichloromethane	ND	ug/m3	2.3	0.60	1.68		02/20/18 19:10	75-27-4	
Bromoform	ND	ug/m3	8.8	1.2	1.68		02/20/18 19:10	75-25-2	
Bromomethane	ND	ug/m3	1.3	0.35	1.68		02/20/18 19:10	74-83-9	
1,3-Butadiene	ND	ug/m3	1.9	0.35	1.68		02/20/18 19:10	106-99-0	
2-Butanone (MEK)	**25.8**	ug/m3	5.0	0.34	1.68		02/20/18 19:10	78-93-3	
Carbon disulfide	**7.4**	ug/m3	1.1	0.30	1.68		02/20/18 19:10	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.53	1.68		02/20/18 19:10	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	0.30	1.68		02/20/18 19:10	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.34	1.68		02/20/18 19:10	75-00-3	
Chloroform	ND	ug/m3	0.83	0.39	1.68		02/20/18 19:10	67-66-3	
Chloromethane	ND	ug/m3	0.71	0.23	1.68		02/20/18 19:10	74-87-3	
Cyclohexane	ND	ug/m3	1.2	0.38	1.68		02/20/18 19:10	110-82-7	
Dibromochloromethane	ND	ug/m3	2.9	0.74	1.68		02/20/18 19:10	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.6	0.56	1.68		02/20/18 19:10	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.0	0.55	1.68		02/20/18 19:10	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.0	0.78	1.68		02/20/18 19:10	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.0	0.37	1.68		02/20/18 19:10	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.7	0.70	1.68		02/20/18 19:10	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.36	1.68		02/20/18 19:10	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.69	0.33	1.68		02/20/18 19:10	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.40	1.68		02/20/18 19:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.57	1.68		02/20/18 19:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.50	1.68		02/20/18 19:10	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.51	1.68		02/20/18 19:10	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.41	1.68		02/20/18 19:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.71	1.68		02/20/18 19:10	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.4	0.74	1.68		02/20/18 19:10	76-14-2	
Ethanol	ND	ug/m3	3.2	0.78	1.68		02/20/18 19:10	64-17-5	
Ethyl acetate	ND	ug/m3	1.2	0.33	1.68		02/20/18 19:10	141-78-6	
Ethylbenzene	**4.3**	ug/m3	1.5	0.29	1.68		02/20/18 19:10	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.36	1.68		02/20/18 19:10	622-96-8	
n-Heptane	**9.2**	ug/m3	1.4	0.35	1.68		02/20/18 19:10	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.6	1.5	1.68		02/20/18 19:10	87-68-3	
n-Hexane	**21.9**	ug/m3	1.2	0.56	1.68		02/20/18 19:10	110-54-3	
2-Hexanone	ND	ug/m3	7.0	1.0	1.68		02/20/18 19:10	591-78-6	
Methylene Chloride	ND	ug/m3	5.9	2.6	1.68		02/20/18 19:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.0	0.60	1.68		02/20/18 19:10	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.1	1.1	1.68		02/20/18 19:10	1634-04-4	
Naphthalene	ND	ug/m3	4.5	1.0	1.68		02/20/18 19:10	91-20-3	
2-Propanol	**8.1**	ug/m3	4.2	2.1	1.68		02/20/18 19:10	67-63-0	
Propylene	**323**	ug/m3	0.59	0.26	1.68		02/20/18 19:10	115-07-1	E
Styrene	ND	ug/m3	1.5	0.28	1.68		02/20/18 19:10	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.49	1.68		02/20/18 19:10	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-11 **Lab ID: 10420487010** Collected: 02/10/18 16:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.48	1.68		02/20/18 19:10	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.46	1.68		02/20/18 19:10	109-99-9	
Toluene	**34.7**	ug/m3	1.3	0.27	1.68		02/20/18 19:10	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.3	1.6	1.68		02/20/18 19:10	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.57	1.68		02/20/18 19:10	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.93	0.38	1.68		02/20/18 19:10	79-00-5	
Trichloroethene	ND	ug/m3	0.92	0.45	1.68		02/20/18 19:10	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.9	0.70	1.68		02/20/18 19:10	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.6	0.62	1.68		02/20/18 19:10	76-13-1	
1,2,4-Trimethylbenzene	**0.95J**	ug/m3	1.7	0.29	1.68		02/20/18 19:10	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.69	1.68		02/20/18 19:10	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.28	1.68		02/20/18 19:10	108-05-4	
Vinyl chloride	ND	ug/m3	2.2	0.21	1.68		02/20/18 19:10	75-01-4	
m&p-Xylene	**7.1**	ug/m3	3.0	0.59	1.68		02/20/18 19:10	179601-23-1	
o-Xylene	**0.78J**	ug/m3	1.5	0.62	1.68		02/20/18 19:10	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**61.9**	ppmv	28.2	1.2	2.82		03/02/18 10:21	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-10 **Lab ID: 10420487011** Collected: 02/11/18 08:40 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**72.9**	ug/m3	4.0	2.5	1.68		02/20/18 19:45	67-64-1	
Benzene	**8.3**	ug/m3	0.55	0.25	1.68		02/20/18 19:45	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.40	1.68		02/20/18 19:45	100-44-7	
Bromodichloromethane	ND	ug/m3	2.3	0.60	1.68		02/20/18 19:45	75-27-4	
Bromoform	ND	ug/m3	8.8	1.2	1.68		02/20/18 19:45	75-25-2	
Bromomethane	ND	ug/m3	1.3	0.35	1.68		02/20/18 19:45	74-83-9	
1,3-Butadiene	ND	ug/m3	1.9	0.35	1.68		02/20/18 19:45	106-99-0	
2-Butanone (MEK)	**24.4**	ug/m3	5.0	0.34	1.68		02/20/18 19:45	78-93-3	
Carbon disulfide	**7.4**	ug/m3	1.1	0.30	1.68		02/20/18 19:45	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.53	1.68		02/20/18 19:45	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	0.30	1.68		02/20/18 19:45	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.34	1.68		02/20/18 19:45	75-00-3	
Chloroform	ND	ug/m3	0.83	0.39	1.68		02/20/18 19:45	67-66-3	
Chloromethane	ND	ug/m3	0.71	0.23	1.68		02/20/18 19:45	74-87-3	
Cyclohexane	ND	ug/m3	1.2	0.38	1.68		02/20/18 19:45	110-82-7	
Dibromochloromethane	ND	ug/m3	2.9	0.74	1.68		02/20/18 19:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.6	0.56	1.68		02/20/18 19:45	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.0	0.55	1.68		02/20/18 19:45	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.0	0.78	1.68		02/20/18 19:45	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.0	0.37	1.68		02/20/18 19:45	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.7	0.70	1.68		02/20/18 19:45	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.36	1.68		02/20/18 19:45	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.69	0.33	1.68		02/20/18 19:45	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.40	1.68		02/20/18 19:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.57	1.68		02/20/18 19:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.50	1.68		02/20/18 19:45	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.51	1.68		02/20/18 19:45	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.41	1.68		02/20/18 19:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.71	1.68		02/20/18 19:45	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.4	0.74	1.68		02/20/18 19:45	76-14-2	
Ethanol	ND	ug/m3	3.2	0.78	1.68		02/20/18 19:45	64-17-5	
Ethyl acetate	ND	ug/m3	1.2	0.33	1.68		02/20/18 19:45	141-78-6	
Ethylbenzene	**1.6**	ug/m3	1.5	0.29	1.68		02/20/18 19:45	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.36	1.68		02/20/18 19:45	622-96-8	
n-Heptane	**6.7**	ug/m3	1.4	0.35	1.68		02/20/18 19:45	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.6	1.5	1.68		02/20/18 19:45	87-68-3	
n-Hexane	**16.0**	ug/m3	1.2	0.56	1.68		02/20/18 19:45	110-54-3	
2-Hexanone	ND	ug/m3	7.0	1.0	1.68		02/20/18 19:45	591-78-6	
Methylene Chloride	ND	ug/m3	5.9	2.6	1.68		02/20/18 19:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.0	0.60	1.68		02/20/18 19:45	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.1	1.1	1.68		02/20/18 19:45	1634-04-4	
Naphthalene	ND	ug/m3	4.5	1.0	1.68		02/20/18 19:45	91-20-3	
2-Propanol	ND	ug/m3	4.2	2.1	1.68		02/20/18 19:45	67-63-0	
Propylene	**180**	ug/m3	0.59	0.26	1.68		02/20/18 19:45	115-07-1	E
Styrene	ND	ug/m3	1.5	0.28	1.68		02/20/18 19:45	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.49	1.68		02/20/18 19:45	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-10 **Lab ID: 10420487011** Collected: 02/11/18 08:40 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.48	1.68		02/20/18 19:45	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.46	1.68		02/20/18 19:45	109-99-9	
Toluene	**9.7**	ug/m3	1.3	0.27	1.68		02/20/18 19:45	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.3	1.6	1.68		02/20/18 19:45	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.57	1.68		02/20/18 19:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.93	0.38	1.68		02/20/18 19:45	79-00-5	
Trichloroethene	ND	ug/m3	0.92	0.45	1.68		02/20/18 19:45	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.9	0.70	1.68		02/20/18 19:45	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.6	0.62	1.68		02/20/18 19:45	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.7	0.29	1.68		02/20/18 19:45	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.69	1.68		02/20/18 19:45	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.28	1.68		02/20/18 19:45	108-05-4	
Vinyl chloride	ND	ug/m3	2.2	0.21	1.68		02/20/18 19:45	75-01-4	
m&p-Xylene	**2.9J**	ug/m3	3.0	0.59	1.68		02/20/18 19:45	179601-23-1	
o-Xylene	ND	ug/m3	1.5	0.62	1.68		02/20/18 19:45	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**1560**	ppmv	28.2	1.2	2.82		03/02/18 11:21	74-82-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-12 **Lab ID: 10420487012** Collected: 02/11/18 11:18 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**109**	ug/m3	4.2	2.6	1.74		02/20/18 20:19	67-64-1	
Benzene	**28.9**	ug/m3	0.57	0.26	1.74		02/20/18 20:19	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.41	1.74		02/20/18 20:19	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.62	1.74		02/20/18 20:19	75-27-4	
Bromoform	ND	ug/m3	9.1	1.2	1.74		02/20/18 20:19	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.36	1.74		02/20/18 20:19	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.36	1.74		02/20/18 20:19	106-99-0	
2-Butanone (MEK)	**29.9**	ug/m3	5.2	0.35	1.74		02/20/18 20:19	78-93-3	
Carbon disulfide	**37.5**	ug/m3	1.1	0.31	1.74		02/20/18 20:19	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.55	1.74		02/20/18 20:19	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	0.31	1.74		02/20/18 20:19	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.35	1.74		02/20/18 20:19	75-00-3	
Chloroform	ND	ug/m3	0.86	0.40	1.74		02/20/18 20:19	67-66-3	
Chloromethane	ND	ug/m3	0.73	0.23	1.74		02/20/18 20:19	74-87-3	
Cyclohexane	**90.6**	ug/m3	1.2	0.39	1.74		02/20/18 20:19	110-82-7	
Dibromochloromethane	ND	ug/m3	3.0	0.77	1.74		02/20/18 20:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.7	0.58	1.74		02/20/18 20:19	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.1	0.57	1.74		02/20/18 20:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.1	0.81	1.74		02/20/18 20:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.1	0.38	1.74		02/20/18 20:19	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.72	1.74		02/20/18 20:19	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.37	1.74		02/20/18 20:19	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.72	0.34	1.74		02/20/18 20:19	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.41	1.74		02/20/18 20:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.59	1.74		02/20/18 20:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.51	1.74		02/20/18 20:19	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.53	1.74		02/20/18 20:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.43	1.74		02/20/18 20:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.73	1.74		02/20/18 20:19	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.5	0.77	1.74		02/20/18 20:19	76-14-2	
Ethanol	ND	ug/m3	3.3	0.81	1.74		02/20/18 20:19	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.34	1.74		02/20/18 20:19	141-78-6	
Ethylbenzene	**3.7**	ug/m3	1.5	0.30	1.74		02/20/18 20:19	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.37	1.74		02/20/18 20:19	622-96-8	
n-Heptane	**37.8**	ug/m3	1.4	0.37	1.74		02/20/18 20:19	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.8	1.5	1.74		02/20/18 20:19	87-68-3	
n-Hexane	**111**	ug/m3	1.2	0.58	1.74		02/20/18 20:19	110-54-3	
2-Hexanone	ND	ug/m3	7.2	1.1	1.74		02/20/18 20:19	591-78-6	
Methylene Chloride	ND	ug/m3	6.1	2.6	1.74		02/20/18 20:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.2	0.62	1.74		02/20/18 20:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.4	1.2	1.74		02/20/18 20:19	1634-04-4	
Naphthalene	ND	ug/m3	4.6	1.0	1.74		02/20/18 20:19	91-20-3	
2-Propanol	ND	ug/m3	4.4	2.2	1.74		02/20/18 20:19	67-63-0	
Propylene	ND	ug/m3	0.61	0.27	1.74		02/20/18 20:19	115-07-1	
Styrene	ND	ug/m3	1.5	0.29	1.74		02/20/18 20:19	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.50	1.74		02/20/18 20:19	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-12 **Lab ID: 10420487012** Collected: 02/11/18 11:18 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.50	1.74		02/20/18 20:19	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.48	1.74		02/20/18 20:19	109-99-9	
Toluene	**32.9**	ug/m3	1.3	0.28	1.74		02/20/18 20:19	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.6	1.7	1.74		02/20/18 20:19	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.60	1.74		02/20/18 20:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.97	0.39	1.74		02/20/18 20:19	79-00-5	
Trichloroethene	ND	ug/m3	0.95	0.47	1.74		02/20/18 20:19	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	0.73	1.74		02/20/18 20:19	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.7	0.64	1.74		02/20/18 20:19	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.7	0.30	1.74		02/20/18 20:19	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.72	1.74		02/20/18 20:19	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.29	1.74		02/20/18 20:19	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.22	1.74		02/20/18 20:19	75-01-4	
m&p-Xylene	**7.3**	ug/m3	3.1	0.61	1.74		02/20/18 20:19	179601-23-1	
o-Xylene	**1.7**	ug/m3	1.5	0.65	1.74		02/20/18 20:19	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**95600**	ppmv	29.2	1.2	2.92		03/02/18 11:30	74-82-8	E

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-14 **Lab ID: 10420487013** Collected: 02/11/18 11:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**428**	ug/m3	4.3	2.7	1.77		02/20/18 20:53	67-64-1	
Benzene	**14.6**	ug/m3	0.58	0.27	1.77		02/20/18 20:53	71-43-2	
Benzyl chloride	ND	ug/m3	1.9	0.42	1.77		02/20/18 20:53	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.63	1.77		02/20/18 20:53	75-27-4	
Bromoform	ND	ug/m3	9.3	1.2	1.77		02/20/18 20:53	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.37	1.77		02/20/18 20:53	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.36	1.77		02/20/18 20:53	106-99-0	
2-Butanone (MEK)	**82.1**	ug/m3	5.3	0.36	1.77		02/20/18 20:53	78-93-3	
Carbon disulfide	**12.8**	ug/m3	1.1	0.32	1.77		02/20/18 20:53	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.56	1.77		02/20/18 20:53	56-23-5	
Chlorobenzene	ND	ug/m3	1.7	0.32	1.77		02/20/18 20:53	108-90-7	
Chloroethane	ND	ug/m3	2.4	0.36	1.77		02/20/18 20:53	75-00-3	
Chloroform	ND	ug/m3	0.88	0.41	1.77		02/20/18 20:53	67-66-3	
Chloromethane	ND	ug/m3	0.74	0.24	1.77		02/20/18 20:53	74-87-3	
Cyclohexane	ND	ug/m3	1.2	0.40	1.77		02/20/18 20:53	110-82-7	
Dibromochloromethane	ND	ug/m3	3.1	0.78	1.77		02/20/18 20:53	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.8	0.59	1.77		02/20/18 20:53	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.2	0.58	1.77		02/20/18 20:53	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.2	0.82	1.77		02/20/18 20:53	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.2	0.39	1.77		02/20/18 20:53	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.74	1.77		02/20/18 20:53	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.5	0.38	1.77		02/20/18 20:53	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.73	0.35	1.77		02/20/18 20:53	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.42	1.77		02/20/18 20:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.60	1.77		02/20/18 20:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.52	1.77		02/20/18 20:53	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.7	0.54	1.77		02/20/18 20:53	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.43	1.77		02/20/18 20:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.74	1.77		02/20/18 20:53	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.5	0.78	1.77		02/20/18 20:53	76-14-2	
Ethanol	ND	ug/m3	3.4	0.82	1.77		02/20/18 20:53	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.35	1.77		02/20/18 20:53	141-78-6	
Ethylbenzene	**2.9**	ug/m3	1.6	0.30	1.77		02/20/18 20:53	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.8	0.38	1.77		02/20/18 20:53	622-96-8	
n-Heptane	**16.5**	ug/m3	1.5	0.37	1.77		02/20/18 20:53	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.8	1.5	1.77		02/20/18 20:53	87-68-3	
n-Hexane	**30.0**	ug/m3	1.3	0.59	1.77		02/20/18 20:53	110-54-3	
2-Hexanone	ND	ug/m3	7.4	1.1	1.77		02/20/18 20:53	591-78-6	
Methylene Chloride	ND	ug/m3	6.2	2.7	1.77		02/20/18 20:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.4	0.63	1.77		02/20/18 20:53	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.5	1.2	1.77		02/20/18 20:53	1634-04-4	
Naphthalene	ND	ug/m3	4.7	1.1	1.77		02/20/18 20:53	91-20-3	
2-Propanol	ND	ug/m3	4.4	2.2	1.77		02/20/18 20:53	67-63-0	
Propylene	ND	ug/m3	0.62	0.28	1.77		02/20/18 20:53	115-07-1	
Styrene	ND	ug/m3	1.5	0.30	1.77		02/20/18 20:53	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.51	1.77		02/20/18 20:53	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-14 **Lab ID: 10420487013** Collected: 02/11/18 11:48 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.51	1.77		02/20/18 20:53	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.1	0.48	1.77		02/20/18 20:53	109-99-9	
Toluene	**17.8**	ug/m3	1.4	0.28	1.77		02/20/18 20:53	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.7	1.7	1.77		02/20/18 20:53	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.0	0.61	1.77		02/20/18 20:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.98	0.40	1.77		02/20/18 20:53	79-00-5	
Trichloroethene	ND	ug/m3	0.97	0.47	1.77		02/20/18 20:53	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	0.74	1.77		02/20/18 20:53	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.8	0.65	1.77		02/20/18 20:53	76-13-1	
1,2,4-Trimethylbenzene	**0.90J**	ug/m3	1.8	0.30	1.77		02/20/18 20:53	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.8	0.73	1.77		02/20/18 20:53	108-67-8	
Vinyl acetate	**8.6**	ug/m3	1.3	0.29	1.77		02/20/18 20:53	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.22	1.77		02/20/18 20:53	75-01-4	
m&p-Xylene	**6.7**	ug/m3	3.1	0.62	1.77		02/20/18 20:53	179601-23-1	
o-Xylene	**1.0J**	ug/m3	1.6	0.66	1.77		02/20/18 20:53	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**9220**	ppmv	23.4	0.99	2.34		03/02/18 11:40	74-82-8	E

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-2 **Lab ID: 10420487014** Collected: 02/12/18 10:34 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**90.7**	ug/m3	4.2	2.6	1.74		02/20/18 21:59	67-64-1	
Benzene	**19.0**	ug/m3	0.57	0.26	1.74		02/20/18 21:59	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.41	1.74		02/20/18 21:59	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	0.62	1.74		02/20/18 21:59	75-27-4	
Bromoform	ND	ug/m3	9.1	1.2	1.74		02/20/18 21:59	75-25-2	
Bromomethane	ND	ug/m3	1.4	0.36	1.74		02/20/18 21:59	74-83-9	
1,3-Butadiene	ND	ug/m3	2.0	0.36	1.74		02/20/18 21:59	106-99-0	
2-Butanone (MEK)	**30.3**	ug/m3	5.2	0.35	1.74		02/20/18 21:59	78-93-3	
Carbon disulfide	**10.4**	ug/m3	1.1	0.31	1.74		02/20/18 21:59	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.55	1.74		02/20/18 21:59	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	0.31	1.74		02/20/18 21:59	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.35	1.74		02/20/18 21:59	75-00-3	
Chloroform	ND	ug/m3	0.86	0.40	1.74		02/20/18 21:59	67-66-3	
Chloromethane	ND	ug/m3	0.73	0.23	1.74		02/20/18 21:59	74-87-3	
Cyclohexane	**9.0**	ug/m3	1.2	0.39	1.74		02/20/18 21:59	110-82-7	
Dibromochloromethane	ND	ug/m3	3.0	0.77	1.74		02/20/18 21:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.7	0.58	1.74		02/20/18 21:59	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.1	0.57	1.74		02/20/18 21:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.1	0.81	1.74		02/20/18 21:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.1	0.38	1.74		02/20/18 21:59	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.8	0.72	1.74		02/20/18 21:59	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.37	1.74		02/20/18 21:59	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.72	0.34	1.74		02/20/18 21:59	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.41	1.74		02/20/18 21:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.59	1.74		02/20/18 21:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.51	1.74		02/20/18 21:59	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.53	1.74		02/20/18 21:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.43	1.74		02/20/18 21:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.73	1.74		02/20/18 21:59	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.5	0.77	1.74		02/20/18 21:59	76-14-2	
Ethanol	ND	ug/m3	3.3	0.81	1.74		02/20/18 21:59	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	0.34	1.74		02/20/18 21:59	141-78-6	
Ethylbenzene	**2.4**	ug/m3	1.5	0.30	1.74		02/20/18 21:59	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.37	1.74		02/20/18 21:59	622-96-8	
n-Heptane	**12.4**	ug/m3	1.4	0.37	1.74		02/20/18 21:59	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.8	1.5	1.74		02/20/18 21:59	87-68-3	
n-Hexane	**28.7**	ug/m3	1.2	0.58	1.74		02/20/18 21:59	110-54-3	
2-Hexanone	ND	ug/m3	7.2	1.1	1.74		02/20/18 21:59	591-78-6	
Methylene Chloride	ND	ug/m3	6.1	2.6	1.74		02/20/18 21:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.2	0.62	1.74		02/20/18 21:59	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.4	1.2	1.74		02/20/18 21:59	1634-04-4	
Naphthalene	ND	ug/m3	4.6	1.0	1.74		02/20/18 21:59	91-20-3	
2-Propanol	ND	ug/m3	4.4	2.2	1.74		02/20/18 21:59	67-63-0	
Propylene	**460**	ug/m3	0.61	0.27	1.74		02/20/18 21:59	115-07-1	E
Styrene	ND	ug/m3	1.5	0.29	1.74		02/20/18 21:59	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.50	1.74		02/20/18 21:59	79-34-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-2 **Lab ID: 10420487014** Collected: 02/12/18 10:34 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	**1.5**	ug/m3	1.2	0.50	1.74		02/20/18 21:59	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.48	1.74		02/20/18 21:59	109-99-9	
Toluene	**13.0**	ug/m3	1.3	0.28	1.74		02/20/18 21:59	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.6	1.7	1.74		02/20/18 21:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.60	1.74		02/20/18 21:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.97	0.39	1.74		02/20/18 21:59	79-00-5	
Trichloroethene	ND	ug/m3	0.95	0.47	1.74		02/20/18 21:59	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	0.73	1.74		02/20/18 21:59	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.7	0.64	1.74		02/20/18 21:59	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.7	0.30	1.74		02/20/18 21:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.72	1.74		02/20/18 21:59	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.29	1.74		02/20/18 21:59	108-05-4	
Vinyl chloride	ND	ug/m3	2.3	0.22	1.74		02/20/18 21:59	75-01-4	
m&p-Xylene	**3.1**	ug/m3	3.1	0.61	1.74		02/20/18 21:59	179601-23-1	
o-Xylene	ND	ug/m3	1.5	0.65	1.74		02/20/18 21:59	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**31.4**	ppmv	22.9	0.97	2.29		03/02/18 11:49	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-4 **Lab ID: 10420487015** Collected: 02/12/18 11:33 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**133**	ug/m3	3.9	2.4	1.63		02/20/18 22:33	67-64-1	
Benzene	**9.9**	ug/m3	0.53	0.25	1.63		02/20/18 22:33	71-43-2	
Benzyl chloride	ND	ug/m3	1.7	0.38	1.63		02/20/18 22:33	100-44-7	
Bromodichloromethane	ND	ug/m3	2.2	0.58	1.63		02/20/18 22:33	75-27-4	
Bromoform	ND	ug/m3	8.6	1.1	1.63		02/20/18 22:33	75-25-2	
Bromomethane	ND	ug/m3	1.3	0.34	1.63		02/20/18 22:33	74-83-9	
1,3-Butadiene	ND	ug/m3	1.8	0.34	1.63		02/20/18 22:33	106-99-0	
2-Butanone (MEK)	**18.4**	ug/m3	4.9	0.33	1.63		02/20/18 22:33	78-93-3	
Carbon disulfide	ND	ug/m3	1.0	0.29	1.63		02/20/18 22:33	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.0	0.52	1.63		02/20/18 22:33	56-23-5	
Chlorobenzene	ND	ug/m3	1.5	0.29	1.63		02/20/18 22:33	108-90-7	
Chloroethane	ND	ug/m3	2.2	0.33	1.63		02/20/18 22:33	75-00-3	
Chloroform	ND	ug/m3	0.81	0.38	1.63		02/20/18 22:33	67-66-3	
Chloromethane	ND	ug/m3	0.68	0.22	1.63		02/20/18 22:33	74-87-3	
Cyclohexane	ND	ug/m3	1.1	0.37	1.63		02/20/18 22:33	110-82-7	
Dibromochloromethane	ND	ug/m3	2.8	0.72	1.63		02/20/18 22:33	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.5	0.54	1.63		02/20/18 22:33	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.0	0.53	1.63		02/20/18 22:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.0	0.76	1.63		02/20/18 22:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.0	0.36	1.63		02/20/18 22:33	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.6	0.68	1.63		02/20/18 22:33	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.3	0.35	1.63		02/20/18 22:33	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.67	0.32	1.63		02/20/18 22:33	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.3	0.39	1.63		02/20/18 22:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.3	0.56	1.63		02/20/18 22:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.3	0.48	1.63		02/20/18 22:33	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.5	0.50	1.63		02/20/18 22:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.5	0.40	1.63		02/20/18 22:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.5	0.68	1.63		02/20/18 22:33	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.3	0.72	1.63		02/20/18 22:33	76-14-2	
Ethanol	**24.0**	ug/m3	3.1	0.76	1.63		02/20/18 22:33	64-17-5	
Ethyl acetate	ND	ug/m3	1.2	0.32	1.63		02/20/18 22:33	141-78-6	
Ethylbenzene	**3.3**	ug/m3	1.4	0.28	1.63		02/20/18 22:33	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.6	0.35	1.63		02/20/18 22:33	622-96-8	
n-Heptane	**6.6**	ug/m3	1.4	0.34	1.63		02/20/18 22:33	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.5	1.4	1.63		02/20/18 22:33	87-68-3	
n-Hexane	**38.3**	ug/m3	2.0	0.91	2.74		02/21/18 13:20	110-54-3	
2-Hexanone	ND	ug/m3	6.8	1.0	1.63		02/20/18 22:33	591-78-6	
Methylene Chloride	**118**	ug/m3	9.7	4.2	2.74		02/21/18 13:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	6.8	0.58	1.63		02/20/18 22:33	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.0	1.1	1.63		02/20/18 22:33	1634-04-4	
Naphthalene	ND	ug/m3	4.3	0.97	1.63		02/20/18 22:33	91-20-3	
2-Propanol	ND	ug/m3	4.1	2.0	1.63		02/20/18 22:33	67-63-0	
Propylene	ND	ug/m3	0.57	0.26	1.63		02/20/18 22:33	115-07-1	
Styrene	ND	ug/m3	1.4	0.27	1.63		02/20/18 22:33	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.1	0.47	1.63		02/20/18 22:33	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-4 **Lab ID: 10420487015** Collected: 02/12/18 11:33 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.1	0.47	1.63		02/20/18 22:33	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.98	0.45	1.63		02/20/18 22:33	109-99-9	
Toluene	**14.0**	ug/m3	1.2	0.26	1.63		02/20/18 22:33	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.1	1.6	1.63		02/20/18 22:33	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.8	0.56	1.63		02/20/18 22:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.90	0.37	1.63		02/20/18 22:33	79-00-5	
Trichloroethene	ND	ug/m3	0.89	0.44	1.63		02/20/18 22:33	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.9	0.68	1.63		02/20/18 22:33	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.5	0.60	1.63		02/20/18 22:33	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.6	0.28	1.63		02/20/18 22:33	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.6	0.67	1.63		02/20/18 22:33	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.27	1.63		02/20/18 22:33	108-05-4	
Vinyl chloride	ND	ug/m3	2.1	0.21	1.63		02/20/18 22:33	75-01-4	
m&p-Xylene	**2.8J**	ug/m3	2.9	0.57	1.63		02/20/18 22:33	179601-23-1	
o-Xylene	ND	ug/m3	1.4	0.60	1.63		02/20/18 22:33	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**40.4**	ppmv	36.1	1.5	3.61		03/02/18 11:59	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-5 **Lab ID: 10420487016** Collected: 02/12/18 13:14 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**149**	ug/m3	4.0	2.5	1.68		02/20/18 23:07	67-64-1	
Benzene	**5.2**	ug/m3	0.55	0.25	1.68		02/20/18 23:07	71-43-2	
Benzyl chloride	ND	ug/m3	1.8	0.40	1.68		02/20/18 23:07	100-44-7	
Bromodichloromethane	ND	ug/m3	2.3	0.60	1.68		02/20/18 23:07	75-27-4	
Bromoform	ND	ug/m3	8.8	1.2	1.68		02/20/18 23:07	75-25-2	
Bromomethane	ND	ug/m3	1.3	0.35	1.68		02/20/18 23:07	74-83-9	
1,3-Butadiene	ND	ug/m3	1.9	0.35	1.68		02/20/18 23:07	106-99-0	
2-Butanone (MEK)	**78.4**	ug/m3	5.0	0.34	1.68		02/20/18 23:07	78-93-3	
Carbon disulfide	ND	ug/m3	1.1	0.30	1.68		02/20/18 23:07	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.1	0.53	1.68		02/20/18 23:07	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	0.30	1.68		02/20/18 23:07	108-90-7	
Chloroethane	ND	ug/m3	2.3	0.34	1.68		02/20/18 23:07	75-00-3	
Chloroform	ND	ug/m3	0.83	0.39	1.68		02/20/18 23:07	67-66-3	
Chloromethane	ND	ug/m3	0.71	0.23	1.68		02/20/18 23:07	74-87-3	
Cyclohexane	ND	ug/m3	1.2	0.38	1.68		02/20/18 23:07	110-82-7	
Dibromochloromethane	ND	ug/m3	2.9	0.74	1.68		02/20/18 23:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.6	0.56	1.68		02/20/18 23:07	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.0	0.55	1.68		02/20/18 23:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.0	0.78	1.68		02/20/18 23:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.0	0.37	1.68		02/20/18 23:07	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.7	0.70	1.68		02/20/18 23:07	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	0.36	1.68		02/20/18 23:07	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.69	0.33	1.68		02/20/18 23:07	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	0.40	1.68		02/20/18 23:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.4	0.57	1.68		02/20/18 23:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	0.50	1.68		02/20/18 23:07	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	0.51	1.68		02/20/18 23:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	0.41	1.68		02/20/18 23:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	0.71	1.68		02/20/18 23:07	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.4	0.74	1.68		02/20/18 23:07	76-14-2	
Ethanol	ND	ug/m3	3.2	0.78	1.68		02/20/18 23:07	64-17-5	
Ethyl acetate	ND	ug/m3	1.2	0.33	1.68		02/20/18 23:07	141-78-6	
Ethylbenzene	**2.2**	ug/m3	1.5	0.29	1.68		02/20/18 23:07	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.7	0.36	1.68		02/20/18 23:07	622-96-8	
n-Heptane	**5.9**	ug/m3	1.4	0.35	1.68		02/20/18 23:07	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.6	1.5	1.68		02/20/18 23:07	87-68-3	
n-Hexane	**16.0**	ug/m3	1.2	0.56	1.68		02/20/18 23:07	110-54-3	
2-Hexanone	ND	ug/m3	7.0	1.0	1.68		02/20/18 23:07	591-78-6	
Methylene Chloride	ND	ug/m3	5.9	2.6	1.68		02/20/18 23:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.0	0.60	1.68		02/20/18 23:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.1	1.1	1.68		02/20/18 23:07	1634-04-4	
Naphthalene	ND	ug/m3	4.5	1.0	1.68		02/20/18 23:07	91-20-3	
2-Propanol	ND	ug/m3	4.2	2.1	1.68		02/20/18 23:07	67-63-0	
Propylene	ND	ug/m3	0.59	0.26	1.68		02/20/18 23:07	115-07-1	
Styrene	ND	ug/m3	1.5	0.28	1.68		02/20/18 23:07	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	0.49	1.68		02/20/18 23:07	79-34-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Sample: SG-5 **Lab ID: 10420487016** Collected: 02/12/18 13:14 Received: 02/13/18 11:05 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Tetrachloroethene	ND	ug/m3	1.2	0.48	1.68		02/20/18 23:07	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	0.46	1.68		02/20/18 23:07	109-99-9	
Toluene	**6.6**	ug/m3	1.3	0.27	1.68		02/20/18 23:07	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	6.3	1.6	1.68		02/20/18 23:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	0.57	1.68		02/20/18 23:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.93	0.38	1.68		02/20/18 23:07	79-00-5	
Trichloroethene	ND	ug/m3	0.92	0.45	1.68		02/20/18 23:07	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.9	0.70	1.68		02/20/18 23:07	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.6	0.62	1.68		02/20/18 23:07	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.7	0.29	1.68		02/20/18 23:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.7	0.69	1.68		02/20/18 23:07	108-67-8	
Vinyl acetate	ND	ug/m3	1.2	0.28	1.68		02/20/18 23:07	108-05-4	
Vinyl chloride	ND	ug/m3	2.2	0.21	1.68		02/20/18 23:07	75-01-4	
m&p-Xylene	**3.1**	ug/m3	3.0	0.59	1.68		02/20/18 23:07	179601-23-1	
o-Xylene	ND	ug/m3	1.5	0.62	1.68		02/20/18 23:07	95-47-6	
TO3 GCV AIR Meth,Ethane,Ethene	Analytical Method: TO-3 Air								
Methane	**2020**	ppmv	22.1	0.93	2.21		03/02/18 12:08	74-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

QC Batch: 523866 Analysis Method: TO-15
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10420487001, 10420487002, 10420487003, 10420487004, 10420487005, 10420487006, 10420487007, 10420487008, 10420487009, 10420487010, 10420487011, 10420487012, 10420487013, 10420487014, 10420487015, 10420487016

METHOD BLANK: 2843458 Matrix: Air
Associated Lab Samples: 10420487001, 10420487002, 10420487003, 10420487004, 10420487005, 10420487006, 10420487007, 10420487008, 10420487009, 10420487010, 10420487011, 10420487012, 10420487013, 10420487014, 10420487015, 10420487016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	1.1	0.34	02/20/18 11:58	
1,1,2,2-Tetrachloroethane	ug/m3	ND	0.70	0.29	02/20/18 11:58	
1,1,2-Trichloroethane	ug/m3	ND	0.56	0.22	02/20/18 11:58	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	1.6	0.37	02/20/18 11:58	
1,1-Dichloroethane	ug/m3	ND	0.82	0.21	02/20/18 11:58	
1,1-Dichloroethene	ug/m3	ND	0.81	0.24	02/20/18 11:58	
1,2,4-Trichlorobenzene	ug/m3	ND	3.8	0.96	02/20/18 11:58	
1,2,4-Trimethylbenzene	ug/m3	ND	1.0	0.17	02/20/18 11:58	
1,2-Dibromoethane (EDB)	ug/m3	ND	1.6	0.33	02/20/18 11:58	
1,2-Dichlorobenzene	ug/m3	ND	1.2	0.33	02/20/18 11:58	
1,2-Dichloroethane	ug/m3	ND	0.41	0.20	02/20/18 11:58	
1,2-Dichloropropane	ug/m3	ND	0.94	0.31	02/20/18 11:58	
1,3,5-Trimethylbenzene	ug/m3	ND	1.0	0.41	02/20/18 11:58	
1,3-Butadiene	ug/m3	ND	1.1	0.21	02/20/18 11:58	MN
1,3-Dichlorobenzene	ug/m3	ND	1.2	0.47	02/20/18 11:58	
1,4-Dichlorobenzene	ug/m3	ND	1.2	0.22	02/20/18 11:58	
2-Butanone (MEK)	ug/m3	ND	3.0	0.20	02/20/18 11:58	
2-Hexanone	ug/m3	ND	4.2	0.61	02/20/18 11:58	
2-Propanol	ug/m3	ND	2.5	1.2	02/20/18 11:58	
4-Ethyltoluene	ug/m3	ND	1.0	0.21	02/20/18 11:58	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	4.2	0.36	02/20/18 11:58	
Acetone	ug/m3	ND	2.4	1.5	02/20/18 11:58	
Benzene	ug/m3	ND	0.32	0.15	02/20/18 11:58	
Benzyl chloride	ug/m3	ND	1.0	0.24	02/20/18 11:58	
Bromodichloromethane	ug/m3	ND	1.4	0.36	02/20/18 11:58	
Bromoform	ug/m3	ND	5.3	0.69	02/20/18 11:58	MN
Bromomethane	ug/m3	ND	0.79	0.21	02/20/18 11:58	
Carbon disulfide	ug/m3	ND	0.63	0.18	02/20/18 11:58	
Carbon tetrachloride	ug/m3	ND	0.64	0.32	02/20/18 11:58	
Chlorobenzene	ug/m3	ND	0.94	0.18	02/20/18 11:58	
Chloroethane	ug/m3	ND	1.3	0.20	02/20/18 11:58	MN
Chloroform	ug/m3	ND	0.50	0.23	02/20/18 11:58	
Chloromethane	ug/m3	ND	0.42	0.13	02/20/18 11:58	
cis-1,2-Dichloroethene	ug/m3	ND	0.81	0.34	02/20/18 11:58	
cis-1,3-Dichloropropene	ug/m3	ND	0.92	0.24	02/20/18 11:58	
Cyclohexane	ug/m3	ND	0.70	0.23	02/20/18 11:58	
Dibromochloromethane	ug/m3	ND	1.7	0.44	02/20/18 11:58	
Dichlorodifluoromethane	ug/m3	ND	1.0	0.42	02/20/18 11:58	

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

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

QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

METHOD BLANK: 2843458 Matrix: Air

Associated Lab Samples: 10420487001, 10420487002, 10420487003, 10420487004, 10420487005, 10420487006, 10420487007, 10420487008, 10420487009, 10420487010, 10420487011, 10420487012, 10420487013, 10420487014, 10420487015, 10420487016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dichlorotetrafluoroethane	ug/m3	ND	1.4	0.44	02/20/18 11:58	
Ethanol	ug/m3	ND	1.9	0.46	02/20/18 11:58	MN
Ethyl acetate	ug/m3	ND	0.73	0.20	02/20/18 11:58	
Ethylbenzene	ug/m3	ND	0.88	0.17	02/20/18 11:58	
Hexachloro-1,3-butadiene	ug/m3	ND	2.2	0.87	02/20/18 11:58	
m&p-Xylene	ug/m3	ND	1.8	0.35	02/20/18 11:58	
Methyl-tert-butyl ether	ug/m3	ND	3.7	0.67	02/20/18 11:58	
Methylene Chloride	ug/m3	ND	3.5	1.5	02/20/18 11:58	
n-Heptane	ug/m3	ND	0.83	0.21	02/20/18 11:58	
n-Hexane	ug/m3	ND	0.72	0.33	02/20/18 11:58	
Naphthalene	ug/m3	ND	2.7	0.60	02/20/18 11:58	
o-Xylene	ug/m3	ND	0.88	0.37	02/20/18 11:58	
Propylene	ug/m3	ND	0.35	0.16	02/20/18 11:58	
Styrene	ug/m3	ND	0.87	0.17	02/20/18 11:58	
Tetrachloroethene	ug/m3	ND	0.69	0.29	02/20/18 11:58	
Tetrahydrofuran	ug/m3	ND	0.60	0.27	02/20/18 11:58	
Toluene	ug/m3	ND	0.77	0.16	02/20/18 11:58	
trans-1,2-Dichloroethene	ug/m3	ND	0.81	0.30	02/20/18 11:58	
trans-1,3-Dichloropropene	ug/m3	ND	0.92	0.42	02/20/18 11:58	
Trichloroethene	ug/m3	ND	0.55	0.27	02/20/18 11:58	
Trichlorofluoromethane	ug/m3	ND	1.1	0.42	02/20/18 11:58	
Vinyl acetate	ug/m3	ND	0.72	0.17	02/20/18 11:58	
Vinyl chloride	ug/m3	ND	1.3	0.13	02/20/18 11:58	MN

LABORATORY CONTROL SAMPLE: 2843459

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	55.5	53.9	97	70-135	
1,1,2,2-Tetrachloroethane	ug/m3	69.8	60.9	87	70-146	
1,1,2-Trichloroethane	ug/m3	55.5	49.0	88	70-135	
1,1,2-Trichlorotrifluoroethane	ug/m3	77.9	86.9	112	63-139	
1,1-Dichloroethane	ug/m3	41.1	42.7	104	70-134	
1,1-Dichloroethene	ug/m3	40.3	43.7	108	70-137	
1,2,4-Trichlorobenzene	ug/m3	75.4	54.8	73	60-133	
1,2,4-Trimethylbenzene	ug/m3	50	40.1	80	70-137	
1,2-Dibromoethane (EDB)	ug/m3	78.1	72.2	92	70-140	
1,2-Dichlorobenzene	ug/m3	61.1	49.7	81	70-137	
1,2-Dichloroethane	ug/m3	41.1	41.6	101	70-136	
1,2-Dichloropropane	ug/m3	47	44.4	95	70-136	
1,3,5-Trimethylbenzene	ug/m3	50	40.9	82	70-133	
1,3-Butadiene	ug/m3	22.5	28.0	125	64-141	
1,3-Dichlorobenzene	ug/m3	61.1	50.2	82	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

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

QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

LABORATORY CONTROL SAMPLE: 2843459

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/m3	61.1	49.3	81	70-134	
2-Butanone (MEK)	ug/m3	30	32.3	108	65-143	
2-Hexanone	ug/m3	104	82.0	79	60-148	
2-Propanol	ug/m3	125	130	104	65-135	
4-Ethyltoluene	ug/m3	50	41.5	83	70-132	
4-Methyl-2-pentanone (MIBK)	ug/m3	104	89.7	86	70-135	
Acetone	ug/m3	121	123	102	59-132	
Benzene	ug/m3	32.5	31.0	95	70-134	
Benzyl chloride	ug/m3	52.6	41.6	79	56-150	
Bromodichloromethane	ug/m3	68.1	67.0	98	70-142	
Bromoform	ug/m3	105	92.8	88	69-150	
Bromomethane	ug/m3	39.5	41.9	106	61-141	
Carbon disulfide	ug/m3	31.6	35.3	112	66-134	
Carbon tetrachloride	ug/m3	64	58.1	91	60-145	
Chlorobenzene	ug/m3	46.8	40.9	87	70-130	
Chloroethane	ug/m3	26.8	32.0	119	65-143	
Chloroform	ug/m3	49.6	48.0	97	70-132	
Chloromethane	ug/m3	21	24.1	115	58-140	
cis-1,2-Dichloroethene	ug/m3	40.3	41.5	103	70-136	
cis-1,3-Dichloropropene	ug/m3	46.1	44.4	96	70-136	
Cyclohexane	ug/m3	35	33.9	97	70-133	
Dibromochloromethane	ug/m3	86.6	89.7	104	68-149	
Dichlorodifluoromethane	ug/m3	50.3	48.4	96	69-130	
Dichlorotetrafluoroethane	ug/m3	71	72.9	103	68-130	
Ethanol	ug/m3	91.6	115	125	65-146	
Ethyl acetate	ug/m3	36.6	38.0	104	68-136	
Ethylbenzene	ug/m3	44.1	38.6	87	70-133	
Hexachloro-1,3-butadiene	ug/m3	108	84.8	78	59-140	
m&p-Xylene	ug/m3	88.3	71.8	81	70-133	
Methyl-tert-butyl ether	ug/m3	91.6	86.3	94	70-132	
Methylene Chloride	ug/m3	177	184	104	67-132	
n-Heptane	ug/m3	41.6	39.4	95	64-136	
n-Hexane	ug/m3	35.8	35.5	99	70-130	
Naphthalene	ug/m3	53.3	37.9	71	55-136	
o-Xylene	ug/m3	44.1	39.1	89	70-132	
Propylene	ug/m3	17.5	18.8	107	37-150	
Styrene	ug/m3	43.3	37.8	87	70-139	
Tetrachloroethene	ug/m3	68.9	62.6	91	70-133	
Tetrahydrofuran	ug/m3	30	32.2	108	62-141	
Toluene	ug/m3	38.3	35.2	92	70-130	
trans-1,2-Dichloroethene	ug/m3	40.3	43.8	109	70-132	
trans-1,3-Dichloropropene	ug/m3	46.1	44.2	96	70-135	
Trichloroethene	ug/m3	54.6	50.3	92	70-135	
Trichlorofluoromethane	ug/m3	57.1	59.6	104	59-140	
Vinyl acetate	ug/m3	35.8	38.6	108	57-150	
Vinyl chloride	ug/m3	26	31.3	121	70-141	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

SAMPLE DUPLICATE: 2844488

Parameter	Units	92372987001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	ND		25	
1,1,2,2-Tetrachloroethane	ug/m3	ND	ND		25	
1,1,2-Trichloroethane	ug/m3	ND	ND		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	ND		25	
1,1-Dichloroethane	ug/m3	ND	ND		25	
1,1-Dichloroethene	ug/m3	ND	ND		25	
1,2,4-Trichlorobenzene	ug/m3	ND	ND		25	
1,2,4-Trimethylbenzene	ug/m3	3.3	3.1	7	25	
1,2-Dibromoethane (EDB)	ug/m3	ND	ND		25	
1,2-Dichlorobenzene	ug/m3	ND	ND		25	
1,2-Dichloroethane	ug/m3	2.9	2.9	3	25	
1,2-Dichloropropane	ug/m3	ND	ND		25	
1,3,5-Trimethylbenzene	ug/m3	ND	ND		25	
1,3-Butadiene	ug/m3	ND	ND		25	
1,3-Dichlorobenzene	ug/m3	ND	ND		25	
1,4-Dichlorobenzene	ug/m3	ND	ND		25	
2-Butanone (MEK)	ug/m3	27.5	28.0	2	25	
2-Hexanone	ug/m3	ND	ND		25	
2-Propanol	ug/m3	45.6	42.9	6	25	
4-Ethyltoluene	ug/m3	2.8	2.7	2	25	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	ND		25	
Acetone	ug/m3	63.0	54.7	14	25	
Benzene	ug/m3	6.2	6.2	1	25	
Benzyl chloride	ug/m3	ND	ND		25	
Bromodichloromethane	ug/m3	ND	ND		25	
Bromoform	ug/m3	ND	ND		25	
Bromomethane	ug/m3	ND	ND		25	
Carbon disulfide	ug/m3	ND	ND		25	
Carbon tetrachloride	ug/m3	ND	ND		25	
Chlorobenzene	ug/m3	ND	ND		25	
Chloroethane	ug/m3	ND	ND		25	
Chloroform	ug/m3	ND	ND		25	
Chloromethane	ug/m3	ND	ND		25	
cis-1,2-Dichloroethene	ug/m3	ND	ND		25	
cis-1,3-Dichloropropene	ug/m3	ND	ND		25	
Cyclohexane	ug/m3	ND	ND		25	
Dibromochloromethane	ug/m3	ND	ND		25	
Dichlorodifluoromethane	ug/m3	ND	ND		25	
Dichlorotetrafluoroethane	ug/m3	ND	ND		25	
Ethanol	ug/m3	173	160	8	25	
Ethyl acetate	ug/m3	4.5	4.4	2	25	
Ethylbenzene	ug/m3	4.1	3.9	5	25	
Hexachloro-1,3-butadiene	ug/m3	ND	ND		25	
m&p-Xylene	ug/m3	12.1	11.7	4	25	
Methyl-tert-butyl ether	ug/m3	ND	ND		25	
Methylene Chloride	ug/m3	ND	ND		25	
n-Heptane	ug/m3	4.9	4.7	3	25	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

SAMPLE DUPLICATE: 2844488

Parameter	Units	92372987001 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Hexane	ug/m3	10.4	10.4	0	25	
Naphthalene	ug/m3	ND	ND		25	
o-Xylene	ug/m3	3.7	3.5	4	25	
Propylene	ug/m3	ND	ND		25	
Styrene	ug/m3	1.7	1.7	2	25	
Tetrachloroethene	ug/m3	ND	ND		25	
Tetrahydrofuran	ug/m3	108	106	2	25	
Toluene	ug/m3	27.1	26.3	3	25	
trans-1,2-Dichloroethene	ug/m3	ND	ND		25	
trans-1,3-Dichloropropene	ug/m3	ND	ND		25	
Trichloroethene	ug/m3	ND	ND		25	
Trichlorofluoromethane	ug/m3	ND	ND		25	
Vinyl acetate	ug/m3	ND	ND		25	
Vinyl chloride	ug/m3	ND	ND		25	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

QC Batch: 525524 Analysis Method: TO-3 Air
QC Batch Method: TO-3 Air Analysis Description: TO3 GCV AIR METH,ETHANE,ETHENE
Associated Lab Samples: 10420487001, 10420487002, 10420487003, 10420487004, 10420487005, 10420487006, 10420487007, 10420487008, 10420487009, 10420487010, 10420487011, 10420487012, 10420487013, 10420487014, 10420487015, 10420487016

METHOD BLANK: 2851984 Matrix: Air
Associated Lab Samples: 10420487001, 10420487002, 10420487003, 10420487004, 10420487005, 10420487006, 10420487007, 10420487008, 10420487009, 10420487010, 10420487011, 10420487012, 10420487013, 10420487014, 10420487015, 10420487016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ppmv	8.8J	10.0	0.42	03/02/18 08:38	

LABORATORY CONTROL SAMPLE & LCSD: 2851985 2851986

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ppmv	1000	774	788	77	79	70-130	2	30	

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

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.

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.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
MN	The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 31401059.001 I-35W MN Rvr Brdg
Pace Project No.: 10420487

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10420487001	**SG-16**	TO-15	523866		
10420487002	**SG-15**	TO-15	523866		
10420487003	**SG-1**	TO-15	523866		
10420487004	**SG-3**	TO-15	523866		
10420487005	**SG-6**	TO-15	523866		
10420487006	**SG-8**	TO-15	523866		
10420487007	**SG-7**	TO-15	523866		
10420487008	**SG-9**	TO-15	523866		
10420487009	**SG-13**	TO-15	523866		
10420487010	**SG-11**	TO-15	523866		
10420487011	**SG-10**	TO-15	523866		
10420487012	**SG-12**	TO-15	523866		
10420487013	**SG-14**	TO-15	523866		
10420487014	**SG-2**	TO-15	523866		
10420487015	**SG-4**	TO-15	523866		
10420487016	**SG-5**	TO-15	523866		
10420487001	**SG-16**	TO-3 Air	525524		
10420487002	**SG-15**	TO-3 Air	525524		
10420487003	**SG-1**	TO-3 Air	525524		
10420487004	**SG-3**	TO-3 Air	525524		
10420487005	**SG-6**	TO-3 Air	525524		
10420487006	**SG-8**	TO-3 Air	525524		
10420487007	**SG-7**	TO-3 Air	525524		
10420487008	**SG-9**	TO-3 Air	525524		
10420487009	**SG-13**	TO-3 Air	525524		
10420487010	**SG-11**	TO-3 Air	525524		
10420487011	**SG-10**	TO-3 Air	525524		
10420487012	**SG-12**	TO-3 Air	525524		
10420487013	**SG-14**	TO-3 Air	525524		
10420487014	**SG-2**	TO-3 Air	525524		
10420487015	**SG-4**	TO-3 Air	525524		
10420487016	**SG-5**	TO-3 Air	525524		

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
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AIR: CHAIN-OF-CUSTODY / A

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fi

WO# : 10420487

10420487

31302

Page: 1 of 2

Section A
Required Client Information:

Company: WSP
Address: 123 N 3rd St Ste 507
Minneapolis, MN 55401
Email To: Paula.Berger@wsp.com
Phone: 612-373-0510 Fax:
Requested Due Date/TAT: MnDOT 5-day

Section B
Required Project Information:

Report To: Paula Berger
Copy To: Kevin Walter
Purchase Order No.:
Project Name: I-35W MN River Bridge
Project Number: 31401059.001

Section C
Invoice Information:

Attention: Accounts Payable
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager/Sales Rep. Bob Michels
Pace Profile #:

Program
☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act
☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other

Location of Sampling by State: MN

Reporting Units
ug/m³ mg/m³
PPBV PPMV
Other

Report Level II. III. IV. Other

'Section D Required Client Information

AIR SAMPLE ID
Sample IDs MUST BE UNIQUE

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

ITEM #	AIR SAMPLE ID	MEDIA CODE	PID Reading (Client only)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE - END/GRAB DATE	COMPOSITE - END/GRAB TIME	Canister Pressure (Initial Field - in Hg)	Canister Pressure (Final Field - in Hg)	Summa Can Number	Flow Control Number	Method: PM10	3C - Fixed Gas (%)	TO-3 BTEX	TO-3M (Methane)	TO-14	TO-15 Full List VOCs	TO-15 Short List BTEX	TO-15 Short List Chlorinated	TO-15 Short List (other)	Pace Lab ID
1	SG-16	1LC	1.4	2-10-18	0840	2-10-18	0847	30	4	2442	1174				X	X					001
2	SG-15		0	2-10-18	0818	2-10-18	0823	25	4	2225	0713				X	X					002
3	SG-1		0.6	2-10-18	0953	2-10-18	1000	28	4	2583	2846				X	X					003
4	SG-3		1.0	2-10-18	1041	2-10-18	1048	29	4	2636	1135				X	X					004
5	SG-6		0.5	2-10-18	1116	2-10-18	1122	29	4	3214	0903				X	X					005
6	SG-8		0.3	2-10-18	1142	2-10-18	1148	30	4	3002	0985				X	X					006
7	SG-7		0.5	2-10-18	1215	2-10-18	1222	30	4	2494	0796				X	X					007
8	SG-9		0.4	2-10-18	1506	2-10-18	1512	27	3	3130	1235				X	X					008
9	SG-13		0	2-10-18	1608	2-10-18	1615	29	4	2623	0786				X	X					009
10	SG-11		0	2-10-18	1640	2-10-18	1648	30	4	2526	1128				X	X					010
11	SG-10		0.2	2-11-18	0833	2-11-18	0840	29	4	3148	1117				X	X					011
12	SG-12		0	2-11-18	1111	2-11-18	1118	30	4	3122	0803				X	X					012

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
WSP	2/13/18	1105	Pace	2/13/18	1105

SAMPLE CONDITIONS

	Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
Amb		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kevin Walter

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY): 02/13/18

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

Pace Analytical®
www.pacelabs.com

AIR: CHAIN-OF-CUSTODY / Analytical Request Document

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

10420487

26026

Page: 2 of 2

Section A Required Client Information:

Company: WSP
Address: 123 North 3rd St. Ste 400
Minneapolis, MN 55401
Email To: Paula Berger
Phone: 612-343-0510 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Paula Berger
Copy To: Kevin Walter
Purchase Order No.:
Project Name: I-35W MNRiverBridge
Project Number: 31401059.001

Section C Invoice Information:

Attention: Accounts Payable
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager/Sales Rep. Bob Michels
Pace Profile #:

Program: ☐ UST ☐ Superfund ☐ Emissions ☐ Clean Air Act ☐ Voluntary Clean Up ☐ Dry Clean ☐ RCRA ☐ Other

Location of Sampling by State: MN

Reporting Units: ug/m³ ___ mg/m³ ___ PPBV ___ PPMV ___ Other ___

Report Level: II.___ III.___ IV.___ Other ___

'Section D Required Client Information

AIR SAMPLE ID
Sample IDs MUST BE UNIQUE

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

ITEM #	'Section D AIR SAMPLE ID	MEDIA CODE	PID Reading (Client only)	COLLECTED COMPOSITE START END/GRAB DATE	TIME	COMPOSITE - DATE	TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	Method: PM10	3C- Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14	TO-15 VOCs	TO15 Short List*	Pace Lab ID
1	SG-1	1LC	0	2-11-18	1141	2-11-18	1148	29	4	2455	11199			X				X			013
2	SG-2	1	1.4	2-12-18	1028	2-12-18	1034	29	4	2438	12088			X				X			014
3	SG-4	1	1.2	2-12-18	1126	2-12-18	1133	30	3	0896	11583			X				X			015
4	SG-5	1	0.8	2-12-18	1307	2-12-18	1314	29	4	3121	09388			X				X			016
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
WSP	2/13/18	1105	Pace	2/13/18	1105

SAMPLE CONDITIONS

Amb	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kevin Walter

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY): 02/13/18

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

Pace Analytical	Document Name: Air Sample Condition Upon Receipt	Document Revised: 28Dec2017 Page 1 of 1
	Document No.: F-MN-A-106-rev.14	Issuing Authority: Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: WSP

Project #: WO#: 10420487

PM: BM2 Due Date: 02/27/18

CLIENT: WSP E & E

Courier: ☐Fed Ex ☐UPS ☐Speedee ☑Client ☐Commercial ☐Pace ☐Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No

Optional: Proj. Due Date: Proj. Name:

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 **Thermom. Used:** ☐151401163 ☐G87A9155100842

Temp should be above freezing to 6°C **Correction Factor:** X **Date & Initials of Person Examining Contents:** 2-13-18 AA

Type of ice Received ☐Blue ☐Wet ☑None

				Comments:
Chain of Custody Present?	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☑Yes	☐No	☐N/A	3.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested?	☑Yes	☐No	☐N/A	7. 5 Day
Sufficient Volume?	☑Yes	☐No	☐N/A	8.
Correct Containers Used?	☑Yes	☐No	☐N/A	9.
-Pace Containers Used?	☑Yes	☐No	☐N/A	
Containers Intact?	☑Yes	☐No	☐N/A	10.
Media: (Air Can) Airbag Filter TDT Passive				11. Individually Certified Cans Y (N) (list which samples)
Sample Labels Match COC?	☑Yes	☐No	☐N/A	12.

Samples Received: Pressure Gauge # 10AIR26

Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
SG-16			-0.5	10	SG-11			0	10
-15		KAS 9/13/18	-4	10	-10			0	10
-1			-1.5	10	-12			-1	10
-3			-1	10	-14			-1.5	10
-6			-2	10	-2			-1	10
-8			-1	10	-4			+0.5	10
-7			0	10	-5			0	10
-9			-2	10	unused can	2736	1522	-29	—
-13			-1.5	10	"	2404	0679	-29.5	—

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

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: BM Date: 2/14/18

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)